Five County Association of Governments / IEM



FIVE COUNTY ASSOCIATION OF GOVERNMENTS

Multi-Jurisdictional Hazard Mitigation Plan

2027

This document has been prepared by IEM International, Inc. (“IEM”) for the Five County Association of Governments (the “Client”) to support development of its multi-jurisdictional hazard mitigation plan. The Client acknowledges that IEM’s services are advisory and that decision-making authority rests solely with the Client. IEM expressly disclaims all responsibility or liability for decisions made or actions taken by the Client based on information, analyses, or recommendations herein.

The information, analyses, and recommendations herein are based on information deemed reliable and provided in good faith, including, without limitation, information provided by the Client and other third parties that has not been independently verified and is inherently uncertain and subject to change. As such, IEM expressly disclaims all warranties, express or implied, and expressly disclaims liability for any direct, indirect, incidental, special, consequential, or punitive damages arising out of or in connection with the use hereof, regardless of the theory of liability, to the maximum extent allowed by law.

This document or its contents may not be disclosed without the Client’s consent, except as required by law. Unauthorized use, dissemination, distribution, or reproduction of this document or its contents, in whole or part, is strictly prohibited.

www.**iem**.com I 800.977.8191
IEM is a registered trademark I © Copyright 2026 IEM
IEM documents are protected under copyright law.

Table of Contents

1 Executive Summary 1

Purpose and Planning Approach 1

Regional Risk and Community Context 1

Mitigation Strategy 1

Implementation and Plan Maintenance 2

Using the Plan 2

2 Introduction 2

What Is Mitigation Planning? 2

Why Develop a Mitigation Plan? 3

How to Use the Plan 3

3 Planning Process 3

Plan Update Approach 3

Funding the Update 4

Changes in Priorities 4

Organizing Resources 4

Plan Participant Involvement 5

The Planning Team 5

Opportunities to Participate 6

Stakeholder Engagement 10

Public Outreach 17

Public Engagement Approach 17

Public Feedback Summary 18

4 Risk Assessment 18

Methodology 18

Hazard Identification 19

Asset Identification 19

Potential Loss Estimates 20

Calculating Probability 20

National Risk Index 21
How to Read the Hazard Profiles 23
Dam Failure 24
Location 25
Magnitude and Extent 28
Previous Occurrences 29
Probability of Future Occurrences 30
Vulnerability Assessment 30
Damaging Winds 34
Location 35
Magnitude and Extent 36
Previous Occurrences 37
Probability of Future Occurrences 39
Vulnerability Assessment 41
Drought 45
Location 46
Magnitude and Extent 49
Previous Occurrences 49
Probability of Future Occurrences 50
Vulnerability Assessment 51
Earthquake 58
Location 59
Magnitude and Extent 60
Previous Occurrences 62
Probability of Future Occurrences 66
Vulnerability Assessment 66
Extreme Heat 78
Location 81
Magnitude and Extent 83
Previous Occurrences 84
Probability of Future Occurrences 85
Vulnerability Assessment 86

Flooding **89**
Location 91
Magnitude and Extent 91
Previous Occurrences 93
Probability of Future Occurrences 96
Vulnerability Assessment 97
National Flood Insurance Program (NFIP) Participation 102
Hail **107**
Location 108
Magnitude and Extent 108
Previous Occurrences 110
Probability of Future Occurrences 112
Vulnerability Assessment 113
Landslide **122**
Location 122
Magnitude and Extent 124
Previous Occurrences 125
Probability of Future Occurrences 127
Vulnerability Assessment 129
Problem Soils **133**
Types of Problem Soils in Southern Utah 134
Location 135
Magnitude and Extent 140
Previous Occurrences 141
Probability of Future Occurrences 141
Vulnerability Assessment 142
Radon Gas **146**
Location 148
Magnitude and Extent 151
Previous Occurrences 152
Probability of Future Occurrences 153
Vulnerability Assessment 154

Thunderstorm and Lightning **158**
Thunderstorms 158
Lightning 159
Location 159
Magnitude and Extent 160
Previous Occurrences 162
Probability of Future Occurrences 164
Vulnerability Assessment 166
Tornadoes **170**
Types of Tornadoes 170
Location 170
Magnitude and Extent 171
Previous Occurrences 172
Probability of Future Occurrences 174
Vulnerability Assessment 175
Wildfire **178**
Location 179
Magnitude and Extent 183
Previous Occurrences 183
Probability of Future Occurrences 189
Vulnerability Assessment 189
Winter Storms **194**
Location 194
Magnitude and Extent 195
Previous Occurrences 196
Probability of Future Occurrences 197
Vulnerability Assessment 200

5 Capability Assessment **204**
Purpose and Scope **204**
Assessment Method **205**
Capability Categories **205**
Regional Findings and Use in the Mitigation Strategy **205**

Five County Summary Findings **206**
National Flood Insurance Program **207**
Capability Improvement and Plan Integration **208**

6 Mitigation Strategy **208**
6.1 Goals and Objectives **208**
Goal 1: Protect Life and Property 208
Goal 2: Protect Critical Facilities, Infrastructure, and Community Lifelines 209
Goal 3: Strengthen Public Education and Risk Communication 209
Goal 4: Strengthen Partnerships and Coordination 209
Goal 5: Strengthen the Resilience of Emergency Services 209
Goal 6: Protect and Use Natural Systems 209
Application of the Goals **210**
6.2 Mitigation Action Development and Evaluation **210**
Comprehensive Range of Actions Considered 210
Linkage to the Risk Assessment and Future Conditions 214
Mitigation Action Plan **214**
Action Prioritization Method 214
Implementation and Administration 216

7 Plan Maintenance **242**
7.1 Maintenance Organization and Responsibilities **242**
7.1.1 Regional Coordination 242
7.1.2 Jurisdiction and Action Responsibilities 243
7.2 Monitoring Implementation **243**
7.2.1 Annual Monitoring Schedule 244
7.3 Evaluating Plan Effectiveness **244**
7.3.1 Event-Driven Review 245
7.4 Updating and Amending the Plan **245**
7.4.1 Five-Year Comprehensive Update 245
7.4.2 Interim Amendments and New Participants 246
7.5 Integration into Other Planning Mechanisms **246**
7.6 Continued Public Participation **247**

7.6.1 Plan Access and Ongoing Comments 247
7.6.2 Annual Review, Amendments, and Updates 248
7.7 Maintenance Records and Follow-Through 248

Beaver County Annex 249

County Profile 249
Geographic Setting and Communities 249
Population and Housing 250
Economy and Critical Infrastructure 250
Land Use, Planning, and Mitigation Context 251
Hazard Identification 251
Vulnerability and Impact Assessment 252
Dam Failure 253
Damaging Winds 255
Drought 257
Earthquake 260
Extreme Heat 263
Flooding 266
Hail 269
Landslide 272
Problem Soils 276
Radon Gas 279
Thunderstorms and Lightning 282
Tornadoes 285
Wildfire 289
Winter Storms 292
Changes in Development 295
Capability Assessment 297
Beaver County Capability Assessment 297
Beaver City Capability Assessment 299
City of Milford Capability Assessment 301
Town of Minersville Capability Assessment 303
Status of Previous Mitigation Actions 304

Mitigation Goals **307**
Goal 1: Protect Life and Property 307
Goal 2: Protect Critical Facilities, Infrastructure, and Community Lifelines 307
Goal 3: Strengthen Public Education and Risk Communication 308
Goal 4: Strengthen Partnerships and Coordination 308
Goal 5: Strengthen the Resilience of Emergency Services 308
Goal 6: Protect and Use Natural Systems 308
2027–2032 Mitigation Action Plan for Beaver County **308**
Action Selection and Analysis 310
Plan Integration **311**
Integration of Prior Plan 311
Integration of Current Plan 312
Continued Public Involvement **314**

Garfield County Annex **315**

County Profile **315**
Geographic Setting and Communities 316
Population and Housing 316
Economy and Critical Infrastructure 317
Land Use, Planning, and Mitigation Context 317
Hazard Identification **318**
Vulnerability and Impact Assessment **320**
Dam Failure 320
Damaging Winds 325
Drought 329
Earthquake 333
Extreme Heat 338
Flooding 342
Hail 347
Landslide 352
Problem Soils 356
Radon Gas 360
Thunderstorms and Lightning 364

Tornadoes 368
Wildfire 372
Winter Storms 377
Changes in Development 381
Capability Assessment 384
Garfield County Capability Assessment 385
Town of Antimony Capability Assessment 386
Town of Boulder Capability Assessment 388
Bryce Canyon City Capability Assessment 389
Town of Cannonville Capability Assessment 390
City of Escalante Capability Assessment 392
Town of Hatch Capability Assessment 393
Town of Henrieville Capability Assessment 395
Panguitch City Capability Assessment 396
Town of Tropic Capability Assessment 398
Status of Previous Mitigation Actions 399
Mitigation Goals 404
Goal 1: Protect Life and Property 404
Goal 2: Protect Critical Facilities, Infrastructure, and Community Lifelines 404
Goal 3: Strengthen Public Education and Risk Communication 404
Goal 4: Strengthen Partnerships and Coordination 404
Goal 5: Strengthen the Resilience of Emergency Services 405
Goal 6: Protect and Use Natural Systems 405
2027–2032 Mitigation Action Plan for Garfield County 405
Action Selection and Analysis 410
Plan Integration 410
Integration of Prior Plan 411
Integration of Current Plan 413
Continued Public Involvement 415
Iron County Annex 419
County Profile 419
Geographic Setting and Communities 419

Population and Housing 420
Economy and Critical Infrastructure 420
Land Use, Planning, and Mitigation Context 421
Hazard Identification 422
Vulnerability and Impact Assessment 423
Dam Failure 424
Damaging Winds 427
Drought 428
Earthquake 432
Extreme Heat 435
Flooding 438
Hail 442
Landslide 445
Problem Soils 449
Radon Gas 453
Thunderstorms and Lightning 457
Tornadoes 460
Wildfire 464
Winter Storms 468
Changes in Development 472
Capability Assessment 474
Unincorporated Iron County Capability Assessment 474
Brian Head Town Capability Assessment 477
Cedar City Capability Assessment 479
Enoch City Capability Assessment 482
Town of Kanarraville Capability Assessment 485
Town of Paragonah Capability Assessment 487
Parowan City Capability Assessment 490
Status of Previous Mitigation Actions 493
Mitigation Goals 511
2027–2032 Mitigation Action Plan for Iron County 512
Action Selection and Analysis 516

Plan Integration **517**
Integration of the 2022–2027 Plan 517
Integration of the 2027–2032 Plan 518
Continued Public Involvement **520**
Conclusion **521**

Kane County Annex **522**

County Profile **522**
Geographic Setting and Communities 522
Population and Housing 523
Economy and Critical Infrastructure 523
Land Use, Planning, and Mitigation Context 524
Hazard Identification **525**
Vulnerability and Impact Assessment **526**
Dam Failure 526
Damaging Winds 529
Drought 532
Earthquake 534
Extreme Heat 537
Flooding 539
Hail 542
Landslide 545
Problem Soils 548
Radon Gas 551
Thunderstorms and Lightning 554
Tornadoes 557
Wildfire 560
Winter Storms 563
Changes in Development **565**
Capability Assessment **567**
Unincorporated Kane County Capability Assessment 568
Town of Alton Capability Assessment 570
Town of Big Water Capability Assessment 572

Town of Glendale Capability Assessment 574
City of Kanab Capability Assessment 576
Town of Orderville Capability Assessment 579
Status of Previous Mitigation Actions 581
Mitigation Goals 594
2027–2032 Mitigation Action Plan for Kane County 594
Action Selection and Analysis 598
Plan Integration 598
Integration of the 2022–2027 Plan 599
Integration of the 2027–2032 Plan 600
Continued Public Involvement 602
Washington County Annex 603
County Profile 603
Geographic Setting and Communities 604
Population and Housing 604
Economy and Critical Infrastructure 605
Land Use, Planning, and Mitigation Context 605
Hazard Identification 606
Vulnerability and Impact Assessment 608
Dam Failure 608
Damaging Winds 618
Drought 626
Earthquake 634
Extreme Heat 643
Flooding 652
Hail 662
Landslide 671
Problem Soils 681
Radon Gas 693
Thunderstorms and Lightning 704
Tornadoes 715
Wildfire 726

Winter Storms 738
Changes in Development 750
Capability Assessment 750
Washington County Capability Assessment 751
St. George Capability Assessment 753
Washington City Capability Assessment 755
Hurricane Capability Assessment 756
Santa Clara Capability Assessment 758
Ivins Capability Assessment 759
La Verkin Capability Assessment 761
Enterprise Capability Assessment 763
Toquerville Capability Assessment 765
Leeds Capability Assessment 766
Virgin Capability Assessment 768
Springdale Capability Assessment 770
New Harmony Capability Assessment 772
Rockville Capability Assessment 774
Apple Valley Capability Assessment 776
Hildale Capability Assessment 778
Status of Previous Mitigation Actions 780
Mitigation Goals 782
2027–2032 Mitigation Action Plan for Washington County 783
Action Selection and Analysis 786
Plan Integration 787
Integration of the Prior Plan (2022–2027) 787
Integration of the Current Plan (2027–2032) 789
Continued Public Involvement 793
Conclusion 797

Appendix A: Abbreviations 800

List of Figures

Figure 1: Beaver County Dam Locations and Available Inundation Areas....26
Figure 2: Garfield County Dam Locations and Available Inundation Areas....26
Figure 3: Iron County Dam Locations and Available Inundation Areas....27
Figure 4: Kane County Dam Locations and Available Inundation Areas....27
Figure 5: Washington County Dam Locations and Available Inundation Areas....28
Figure 6: Standardized Precipitation Index for Beaver County, 1895–2025....47
Figure 7: Standardized Precipitation Index for Kane County, 1895–2025....48
Figure 8: Map of Five Counties Previous Earthquakes Locations and Magnitude....59
Figure 9: 2023 National Seismic Hazard Model and Utah Counties and Extent of Hazard....61
Figure 10: Epicenter Map of Independent Mainshocks in the Utah Region, 1850–2012....63
Figure 11: Earthquake Losses....72
Figure 12: Economic Loss in Five-County Area for Modeled M5.9 Earthquake Scenario....73
Figure 13: Economic Loss and User-Defined Facilities in Beaver County for M5.9 Scenario....74
Figure 14: Economic Loss and User-Defined Facilities in Garfield County for M5.9 Scenario....74
Figure 15: Economic Loss and User-Defined Facilities in Iron County for M5.9 Scenario....75
Figure 16: Economic Loss and User-Defined Facilities in Kane County for M5.9 Scenario....75
Figure 17: Economic Loss and User-Defined Facilities in Washington County for M5.9 Scenario....76
Figure 18: Shake Intensity for Five-County Region M5.9 Scenario....76
Figure 19: Shake Intensity for Beaver County for M5.9 Scenario....77
Figure 20: Shake Intensity for Garfield County for M5.9 Scenario....77
Figure 21: Average Temperature, Milford Municipal Airport, Utah, 1991–2020....79
Figure 22: Average Temperature, Panguitch, Utah, 1991–2020....79
Figure 23: Average Temperature, Kanab, Utah, 1991–2020....80
Figure 24: Average Temperature, Cedar City, Utah, 1991–2020....80
Figure 25: Average Temperature, St. George, Utah, 1991–2020....81
Figure 26: CDC/ATSDR Heat and Health Index Ranks, 2024 (ZIP-Code Level)....82
Figure 27: NWS Heat Index Scale....83
Figure 28: Climate Explorer Average Daily Maximum Temperature Change from the 1961–1990 Observed Baseline....86
Figure 29: Garfield County Landslide Susceptibility Map....123
Figure 30: Washington County Landslide Susceptibility Map....124
Figure 31: Cedar Canyon, MP8 Landslide Complex, Iron County....127
Figure 32: Beaver County Soils Classification Map....136
Figure 33: Garfield County Soils Classification Map....137
Figure 34: Iron County Soils Classification Map....138
Figure 35: Kane County Soils Classification Map....139
Figure 36: Washington County Soils Classification Map....140
Figure 37: How Radon Enters Homes and Buildings....147
Figure 38: Radon, pCi/L Range of Magnitude by County, Utah....149
Figure 39: Radon Geological Hazard Ranking in Local Mitigation Plans, Map by County....150
Figure 40: 2022 Map of Number of Pre-Mitigation Radon Tests on Buildings (Five County AOG Region) 151

Figure 41: Historic Tornado Paths for Five County AOG Region (1950–2025) 174
Figure 42: Beaver County High-Risk WUI Properties 180
Figure 43: Garfield County High-Risk WUI Properties 181
Figure 44: Iron County High-Risk WUI Properties 181
Figure 45: Kane County High-Risk WUI Properties 182
Figure 46: Washington County High-Risk WUI Properties 182
Figure 47: Historic Wildfire Events for the Five-County Region (1999–2020) 188
Figure 48: Map of Beaver County and Incorporated Jurisdictions 250
Figure 49: Map of Garfield County and Incorporated Jurisdictions 316
Figure 50: Garfield County Critical Infrastructure Map 318
Figure 51: Iron County Critical Infrastructure Map 422
Figure 52: Jurisdictional Boundaries of Kane County 523
Figure 53: Kane County Critical Infrastructure Map 525
Figure 54: Map of Washington County and Incorporated Jurisdictions 604
Figure 55: Economic Growth in Washington County 605

List of Tables

Table 1: Changes in Priorities for Each Plan Participant 4
Table 2: Existing Resources Incorporated into the 2027 HMP 4
Table 3: The Hazard Mitigation Planning Team 5
Table 4: Jurisdiction Participation 7
Table 5: Stakeholders Invited to Participate 10
Table 6: Public Outreach Conducted by Each Plan Participant 17
Table 7: Probability Categories 21
Table 8: NRI Hazard Review 21
Table 9: Previous Federal Dam-Failure Disaster Declaration 30
Table 10: Beaufort Wind Scale 36
Table 11: NCEI Storm Events Database for Damaging Winds 60 Knots or Greater 38
Table 12: Probability and Future Conditions – Damaging Winds and High Winds 40
Table 13: Utah Drought Executive Orders Affecting the Planning Area 50
Table 14: Modified Mercalli Intensity (MMI) Scale 60
Table 15: Earthquake History Magnitude 5 and Over 64
Table 16: Additional Earthquake Events 64
Table 17: FCAOG Counties with Unreinforced Masonry Structures (URM) 67
Table 18: Building-Related Economic Loss by Occupancy Type (Millions of Dollars) 72
Table 19: Normal July Temperatures, 1991–2020 81
Table 20: NWS HeatRisk Scale 83
Table 21: NCEI Storm Events Database for Excessive Heat 84
Table 22: Previous Federal Flood-Related Disaster Declarations 94

Table 23: NCEI Storm Events Database Flood and Flash Flood Events $100,000 and Greater for 2021–2025 95
Table 24: NFIP Jurisdictional Inventory 102
Table 25: TORRO Hailstorm Intensity Scale 109
Table 26: National Weather Service Hail Damage-Threat Categories 110
Table 27: NCEI Storm Events Database Hail Records, Diameter at Least 1 Inch, 2021–2025 111
Table 28: Key Storm Events and Impacts (Southwest Utah, 2023–2025) 112
Table 29: Universal Landslide Classification System 125
Table 30: Selected Federal Disaster Declaration Involving Flooding and Landslides 126
Table 31: Selected UGS-Documented Landslide Events in Iron, Kane, and Washington Counties, 2023 126
Table 32: Classification of Potential Expansion of Soils Using Expansion Index (EI) 140
Table 33: Radon Severity Scale 152
Table 34: Severe Thunderstorm Risk Categories 160
Table 35: Lightning Activity Levels 162
Table 36: Thunderstorm Previous Disaster Declarations 163
Table 37: Selected Verified NOAA NCEI Thunderstorm Wind and Lightning Records, 2000–May 2026 163
Table 38: Future Thunderstorm and Lightning Risk by County 165
Table 39: Enhanced Fujita Scale Ratings 171
Table 40: NCEI Storm Events Database Tornado Records, 2000–2025 173
Table 41: Wildfire Previous Disaster Declarations 184
Table 42: Selected Verified NCEI Storm Events Database Wildfire Records, January 2020–May 2026 188
Table 43: Winter Storm Severity Index 195
Table 44: Winter Storms Previous Disaster Declarations 196
Table 45: Selected NCEI Storm Events Database Winter Weather Records, 2020–May 2026 197
Table 46: Regional Probability and Future Winter Storm Conditions by County 199
Table 47: NFIP-Participating Communities in the Five-County Planning Area, as of April 8, 2026 207
Table 48: Hazard Applicability for Beaver County Participants 251
Table 49: Dam Failure Vulnerability and Impact Assessment for Beaver County 253
Table 50: Damaging Winds Vulnerability and Impact Assessment for Beaver County 255
Table 51: Drought Vulnerability and Impact Assessment for Beaver County 257
Table 52: Earthquake Vulnerability and Impact Assessment for Beaver County 260
Table 53: Extreme Heat Vulnerability and Impact Assessment for Beaver County 263
Table 54: Flooding Vulnerability and Impact Assessment for Beaver County 266
Table 55: Hail Vulnerability and Impact Assessment for Beaver County 269
Table 56: Landslide Vulnerability and Impact Assessment for Beaver County 272
Table 57: Problem Soils Vulnerability and Impact Assessment for Beaver County 276
Table 58: Radon Gas Vulnerability and Impact Assessment for Beaver County 279
Table 59: Thunderstorms and Lightning Vulnerability and Impact Assessment for Beaver County 282
Table 60: Tornadoes Vulnerability and Impact Assessment for Beaver County 285
Table 61: Wildfire Vulnerability and Impact Assessment for Beaver County 289
Table 62: Winter Storms Vulnerability and Impact Assessment for Beaver County 292
Table 63: Vulnerability Changes in Beaver County 296
Table 64: Beaver County Capability Assessment 297

Table 65: Beaver City Capability Assessment 299
Table 66: City of Milford Capability Assessment 301
Table 67: Town of Minersville Capability Assessment 303
Table 68: Status of 2022–2027 Mitigation Actions for Beaver County 305
Table 69: 2027–2032 Mitigation Action Selection for Beaver County Participants 309
Table 70: Beaver County Integration of the 2022–2027 Plan 311
Table 71: Beaver County Integration of the 2027–2032 Plan 312
Table 72: Continued Public Involvement Approach for Beaver County 314
Table 73: Hazard Applicability for Garfield County Participants 318
Table 74: Dam Failure Vulnerability and Impact Assessment for Garfield County 320
Table 75: Damaging Winds Vulnerability and Impact Assessment for Garfield County 325
Table 76: Drought Vulnerability and Impact Assessment for Garfield County 329
Table 77: Earthquake Vulnerability and Impact Assessment for Garfield County 333
Table 78: Extreme Heat Vulnerability and Impact Assessment for Garfield County 338
Table 79: Flooding Vulnerability and Impact Assessment for Garfield County 342
Table 80: Hail Vulnerability and Impact Assessment for Garfield County 347
Table 81: Landslide Vulnerability and Impact Assessment for Garfield County 352
Table 82: Problem Soils Vulnerability and Impact Assessment for Garfield County 356
Table 83: Radon Gas Vulnerability and Impact Assessment for Garfield County 360
Table 84: Thunderstorms and Lightning Vulnerability and Impact Assessment for Garfield County 364
Table 85: Tornadoes Vulnerability and Impact Assessment for Garfield County 368
Table 86: Wildfire Vulnerability and Impact Assessment for Garfield County 372
Table 87: Winter Storms Vulnerability and Impact Assessment for Garfield County 377
Table 88: Vulnerability Changes in Garfield County 382
Table 89: Garfield County Capability Assessment 385
Table 90: Town of Antimony Capability Assessment 386
Table 91: Town of Boulder Capability Assessment 388
Table 92: Bryce Canyon City Capability Assessment 389
Table 93: Town of Cannonville Capability Assessment 390
Table 94: City of Escalante Capability Assessment 392
Table 95: Town of Hatch Capability Assessment 393
Table 96: Town of Henrieville Capability Assessment 395
Table 97: Panguitch City Capability Assessment 396
Table 98: Town of Tropic Capability Assessment 398
Table 99: Status of 2022–2027 Mitigation Actions for Garfield County 400
Table 100: 2027–2032 Mitigation Action Selection for Garfield County Participants 405
Table 101: Garfield County Integration of the 2022–2027 Plan 411
Table 102: Garfield County Integration of the 2027–2032 Plan 413
Table 103: Continued Public Involvement Approach for Garfield County 415
Table 104: Rationale for Participants Omitting Hazards in Iron County 422
Table 105: Dam Failure Vulnerability and Impact Assessment for Iron County 424
Table 106: Damaging Winds Vulnerability and Impact Assessment for Iron County 427
Table 107: Drought Vulnerability and Impact Assessment for Iron County 428

Table 108: Earthquake Vulnerability and Impact Assessment for Iron County 432
Table 109: Extreme Heat Vulnerability and Impact Assessment for Iron County 435
Table 110: Flooding Vulnerability and Impact Assessment for Iron County 439
Table 111: Hail Vulnerability and Impact Assessment for Iron County 442
Table 112: Landslide Vulnerability and Impact Assessment for Iron County 445
Table 113: Problem Soils Vulnerability and Impact Assessment for Iron County 449
Table 114: Radon Gas Vulnerability and Impact Assessment for Iron County 453
Table 115: Thunderstorms and Lightning Vulnerability and Impact Assessment for Iron County 457
Table 116: Tornadoes Vulnerability and Impact Assessment for Iron County 460
Table 117: Wildfire Vulnerability and Impact Assessment for Iron County 464
Table 118: Winter Storms Vulnerability and Impact Assessment for Iron County 468
Table 119: Vulnerability Changes in Iron County 472
Table 120: Unincorporated Iron County Capability Assessment 474
Table 121: Brian Head Town Capability Assessment 477
Table 122: Cedar City Capability Assessment 479
Table 123: Enoch City Capability Assessment 482
Table 124: Parowan City Capability Assessment 490
Table 125: Status of 2022–2027 Mitigation Actions for Iron County 493
Table 126: Iron County Jurisdiction Action Selection Matrix 513
Table 127: Iron County Integration of the 2022–2027 Plan 517
Table 128: Iron County Integration of the 2027–2032 Plan 518
Table 129: Continued Public Involvement Approach for Iron County 520
Table 130: Rationale for Participants Omitting Hazards in Kane County 525
Table 131: Dam Failure Vulnerability and Impact Assessment for Kane County 526
Table 132: Damaging Winds Vulnerability and Impact Assessment for Kane County 530
Table 133: Drought Vulnerability and Impact Assessment for Kane County 532
Table 134: Earthquake Vulnerability and Impact Assessment for Kane County 534
Table 135: Extreme Heat Vulnerability and Impact Assessment for Kane County 537
Table 136: Flooding Vulnerability and Impact Assessment for Kane County 539
Table 137: Hail Vulnerability and Impact Assessment for Kane County 542
Table 138: Landslide Vulnerability and Impact Assessment for Kane County 545
Table 139: Problem Soils Vulnerability and Impact Assessment for Kane County 548
Table 140: Radon Gas Vulnerability and Impact Assessment for Kane County 551
Table 141: Thunderstorms and Lightning Vulnerability and Impact Assessment for Kane County 554
Table 142: Tornadoes Vulnerability and Impact Assessment for Kane County 557
Table 143: Wildfire Vulnerability and Impact Assessment for Kane County 560
Table 144: Winter Storms Vulnerability and Impact Assessment for Kane County 563
Table 145: Vulnerability Changes in Kane County 566
Table 146: Unincorporated Kane County Capability Assessment 568
Table 147: Town of Alton Capability Assessment 570
Table 148: Town of Big Water Capability Assessment 572
Table 149: Town of Glendale Capability Assessment 574
Table 150: City of Kanab Capability Assessment 576

Table 151: Town of Orderville Capability Assessment 579
Table 152: Status of 2022–2027 Mitigation Actions for Kane County 581
Table 153: Kane County Jurisdiction Action Selection Matrix 595
Table 154: Kane County Integration of the 2022–2027 Plan 599
Table 155: Kane County Integration of the 2027–2032 Plan 600
Table 156: Continued Public Involvement Approach for Kane County 602
Table 157: Hazard Applicability for Washington County Participants 606
Table 158: Dam Failure Vulnerability and Impact Assessment for Washington County 608
Table 159: Damaging Winds Vulnerability and Impact Assessment for Washington County 618
Table 160: Drought Vulnerability and Impact Assessment for Washington County 626
Table 161: Earthquake Vulnerability and Impact Assessment for Washington County 634
Table 162: Extreme Heat Vulnerability and Impact Assessment for Washington County 643
Table 163: Flooding Vulnerability and Impact Assessment for Washington County 652
Table 164: Hail Vulnerability and Impact Assessment for Washington County 662
Table 165: Landslide Vulnerability and Impact Assessment for Washington County 671
Table 166: Problem Soils Vulnerability and Impact Assessment for Washington County 681
Table 167: Radon Gas Vulnerability and Impact Assessment for Washington County 693
Table 168: Thunderstorms and Lightning Vulnerability and Impact Assessment for Washington County 704
Table 169: Tornadoes Vulnerability and Impact Assessment for Washington County 715
Table 170: Wildfire Vulnerability and Impact Assessment for Washington County 726
Table 171: Winter Storms Vulnerability and Impact Assessment for Washington County 738
Table 172: Vulnerability Changes in Washington County 750
Table 173: Washington County Capability Assessment 751
Table 174: St. George Capability Assessment 753
Table 175: Washington City Capability Assessment 755
Table 176: Hurricane Capability Assessment 756
Table 177: Santa Clara Capability Assessment 758
Table 178: Ivins Capability Assessment 759
Table 179: La Verkin Capability Assessment 761
Table 180: Enterprise Capability Assessment 763
Table 181: Toquerville Capability Assessment 765
Table 182: Leeds Capability Assessment 766
Table 183: Virgin Capability Assessment 768
Table 184: Springdale Capability Assessment 770
Table 185: New Harmony Capability Assessment 772
Table 186: Rockville Capability Assessment 774
Table 187: Apple Valley Capability Assessment 776
Table 188: Hildale Capability Assessment 778
Table 189: Status of 2022–2027 Mitigation Actions for Washington County 780
Table 190: Washington County Jurisdiction Action Selection Matrix 784
Table 191: Washington County Integration of the 2022–2027 Plan 787
Table 192: Washington County Integration of the 2027–2032 Plan 789
Table 193: Continued Public Involvement Approach for Washington County 794

1 Executive Summary

The 2027–2032 Five County Association of Governments (AOG) Multi-Jurisdictional Hazard Mitigation Plan provides a coordinated framework for reducing long-term natural hazard risk across Beaver, Garfield, Iron, Kane, and Washington Counties in southwestern Utah. The plan combines a regional base plan with county- and community-specific annexes to address shared hazards, methods, goals, and maintenance procedures consistently while allowing each participating jurisdiction to document its own risks, capabilities, mitigation priorities, integration approach, and adoption. The plan is intended to support practical, risk-informed decisions by local officials, emergency managers, planners, public works and utility providers, partner agencies, property owners, and the public.

Purpose and Planning Approach

Hazard mitigation is sustained action taken to reduce or eliminate long-term risk to people and property. This plan establishes a systematic process for identifying hazards, assessing vulnerability and community capabilities, evaluating changes since the previous plan, and selecting actions that can reduce future losses. It also supports continued eligibility for Federal Emergency Management Agency (FEMA) mitigation assistance for jurisdictions that satisfy applicable participation and adoption requirements. The update was developed through a multi-jurisdictional planning process that organized local and regional resources, engaged participating governments and stakeholders, provided opportunities for public involvement, and used available plans, studies, mapping, records, and local knowledge to inform the plan.

Regional Risk and Community Context

The Five County region includes rapidly growing cities, rural and agricultural communities, high-elevation recreation destinations, major transportation corridors, public lands, and dispersed infrastructure. The plan evaluates natural hazards that can affect people, property, critical facilities, community lifelines, natural and cultural resources, local economies, and future development. The regional risk assessment documents hazard location, extent, previous occurrences, probability, vulnerability, impacts, and cascading effects. County and community annexes then explain how those risks differ by participant, including exposure associated with floodplains and drainage corridors, wildland-urban interface areas, drought and water-supply constraints, seismic and geologic conditions, severe weather, extreme temperatures, transportation access, and the needs of residents, visitors, businesses, agriculture, and essential services.

Mitigation Strategy

The mitigation strategy translates the risk and capability assessments into an implementable program of action. Participating jurisdictions reviewed a regional mitigation action catalog and selected actions

appropriate to their hazards, vulnerabilities, development trends, and available capabilities. The catalog includes regulatory and planning measures, structural and infrastructure projects, natural-systems protection, education and awareness, and capability-building activities. Actions address needs such as floodplain and drainage management, wildfire risk reduction, water conservation and drought resilience, seismic and geologic risk, severe-weather protection, protection of critical facilities and utilities, emergency communications, public outreach, and integration of hazard information into plans, budgets, development review, and capital programs. Each action is linked to implementation information in the regional strategy, including the hazards and vulnerabilities addressed, responsible entities, potential partners and funding sources, anticipated timeframe, planning-level cost, and priority.

Implementation and Plan Maintenance

FCAOG and participating jurisdictions will use the plan as a living framework rather than a one-time compliance document. Implementation will occur through local plans and ordinances, capital and infrastructure programs, annual budgets, grant development, routine operations, public information, and coordination with county, state, federal, special-district, nonprofit, and private-sector partners. The plan maintenance process establishes procedures to monitor action progress, evaluate changing hazards and development conditions, document integration into other planning mechanisms, consider amendments, continue public involvement, and complete the next five-year update. Progress will depend on local priorities, available funding, technical feasibility, partnership opportunities, and continued coordination among participating jurisdictions.

Using the Plan

Readers seeking regional information should begin with the planning process, risk assessment, mitigation strategy, and plan maintenance sections. Readers interested in a specific county or community should also review the applicable annex for participant-specific vulnerability, capabilities, prior-action status, selected mitigation actions, plan integration, and continued public involvement commitments. Together, the regional sections and jurisdictional annexes provide the basis for coordinated implementation during the 2027–2032 planning period and for sustained investment in a safer and more resilient Five County region.

2 Introduction

What Is Mitigation Planning?

Hazard mitigation is sustained action taken to reduce or eliminate long-term risk to people and property from hazards. Mitigation planning provides a systematic process for identifying hazards, assessing risks and capabilities, and developing actions that can reduce future losses and strengthen community

resilience. This plan is designed to support risk-informed decision-making across the Five County region and to satisfy the local mitigation planning requirements of 44 CFR Part 201 and FEMA Local Mitigation Planning Policy Guide (2025).

Why Develop a Mitigation Plan?

A current, adopted hazard mitigation plan helps participating jurisdictions establish shared risk-reduction priorities, coordinate investments, and integrate mitigation considerations into other plans, policies, programs, and capital decisions. FEMA-approved local mitigation plans are also a condition of eligibility for certain non-emergency Stafford Act assistance and FEMA Hazard Mitigation Assistance funding. Plan approval does not guarantee funding for any proposed action, and each funding program has separate eligibility and application requirements.

The Five County Association of Governments is a voluntary association of local governments serving Beaver, Garfield, Iron, Kane, and Washington Counties in southwestern Utah. This multi-jurisdictional plan provides a regional framework while documenting the jurisdiction-specific participation, risks, capabilities, mitigation actions, plan integration approaches, and adoption needed for each participating jurisdiction.

How to Use the Plan

The plan is organized into a regional base plan and county- and community-specific content. The regional sections document the planning process, regional risk assessment, mitigation strategy, and plan maintenance procedures. The jurisdiction-specific sections describe how hazards affect each participant, identify available capabilities and changes in development, evaluate the status of prior actions, and present the actions selected for the 2027–2032 planning period.

Readers seeking information about a particular hazard should begin with the regional hazard profile and then review the applicable jurisdiction-specific vulnerability and impact assessment. Officials and implementation partners should use the mitigation strategy and project worksheets to guide action development, funding decisions, and coordination.

3 Planning Process

Plan Update Approach

FCAOG, in partnership with participating jurisdictions and technical support from IEM, initiated the update of the regional hazard mitigation plan for Beaver, Garfield, Iron, Kane, and Washington Counties. The planning process was structured around a series of milestones designed to support plan development, including project kickoff activities, risk assessment discussions, capability assessment activities, one-on-

one jurisdiction coordination, mitigation strategy development, plan review, and plan adoption. A participation tracking system was maintained throughout the planning process to document jurisdictional involvement, stakeholder engagement, outreach activities, and supporting documentation. The process was designed to provide multiple opportunities for participation, including regional meetings, individual jurisdiction coordination, document review, email correspondence, and other forms of alternative participation.

Funding the Update

IEM provided technical support for the update as a contractor for the State of Utah under the Utah Direct Technical Assistance (DTA) program.

Changes in Priorities

Participating jurisdictions reviewed previously identified mitigation actions, evaluated implementation status, considered current and emerging risks, and developed updated mitigation priorities. Changes in priorities may result from new hazard information, recent disaster experiences, changes in development patterns, infrastructure improvements, funding opportunities, changes in community capabilities, and evolving local concerns. Table 1 is intended to summarize, for each plan participant, how priorities changed during the update and how those changes affected the updated mitigation strategy.

Table 1: Changes in Priorities for Each Plan Participant

Plan Participant	Description
Participating Jurisdictions	Individual changes in priorities and their effects on the mitigation strategy are not established by the available coordination summary; no finding of unchanged priorities is inferred.

Organizing Resources

Table 2: Existing Resources Incorporated into the 2027 HMP

Existing Resource	Use in Plan
2022–2027 Five County Association of Governments Hazard Mitigation Plan	Prior hazard history and planning context.
Utah Enhanced State Hazard Mitigation Plan (2024)	State hazard context and supporting technical information.
NOAA NCEI Storm Events Database	Historical weather-hazard occurrences and reported impacts, with the selection periods identified in the hazard profiles.

Existing Resource	Use in Plan
NOAA 1991–2020 Climate Normals	Station-specific temperature and precipitation context.
USGS 2023 National Seismic Hazard Model and Utah Geological Survey publications	Earthquake hazard context, documented historical effects, and vulnerable building types.

Plan Participant Involvement

The Planning Team

The planning effort involved 43 jurisdictions across the Five County AOG planning area, including county governments, cities, and towns; 42 were marked participating in the participation tracker, and Kanarraville was marked not participating. Jurisdictions identified as plan participants were invited to participate throughout the planning process. The planning team was supported by Five County AOG staff, local government representatives, and IEM hazard mitigation planning staff. Key planning activities documented to date include a regional Kickoff Meeting held on May 26, 2026; a Risk Assessment Meeting held on June 30, 2026; a Capability Assessment Meeting held on July 28, 2026; and a Mitigation Strategy Meeting held on August 25, 2026. In addition to regional meetings, numerous jurisdictions participated through individual coordination meetings, phone calls, and email-based discussions focused on capability assessment information and local mitigation priorities. [1]

The participation records indicate that jurisdictions from all five counties contributed to at least one stage of the planning process, while many jurisdictions participated in multiple planning activities. Participation included elected officials, emergency managers, planners, public works personnel, city managers, engineers, clerks, and other local officials with responsibilities related to mitigation, infrastructure, emergency management, and community development.

Table 3: The Hazard Mitigation Planning Team

Name	Title	Jurisdiction/Agency
Michael Johnson	Planning Manager	Five County Association of Governments
Casey Garnett	Project Manager	IEM
Patrick Marchman, AICP	Lead Planner	IEM

[1] Five County AOG, FCAOG_HMP_Participation_Tracker_Participation_Status_8.20.26.xlsx, updated August 26, 2026, Jurisdictions, Participation_Log, and Stakeholder_Participants worksheets.

Opportunities to Participate

The planning process was designed to provide multiple opportunities for jurisdictions to contribute information and review planning products. These opportunities included the following:

- Attendance at regional planning meetings
  - Project Kickoff Meeting – May 2026
  - Risk Assessment Meeting – June 2026
  - Capability Assessment Meeting – July 2026
  - Mitigation Strategy Meeting – August 2026
- One-on-one jurisdiction meetings and phone interviews
- Submission of local data and information
- Email coordination and follow-up
- Review of draft planning materials
- Public outreach activities and survey distribution
- Mitigation strategy review and mitigation action updates
- Plan review and adoption activities

Recognizing that not all jurisdictions could participate through the same methods, the planning process also incorporated alternative participation options, including email correspondence, document review, phone calls, data submissions, and one-on-one coordination. These mechanisms allowed jurisdictions to remain engaged even when attendance at regional meetings was not possible.

Table 4: Jurisdiction Participation

Plan Participant	Kickoff Meeting	Risk Assessment Meeting	Other Documented Participation
Beaver County		X	Data submission
Beaver City	X		Capability meeting; Strategy meeting
Milford	X	X	Capability meeting; Strategy meeting
Minersville			Email coordination
Garfield County			Data submission
Antimony Town			No record
Boulder Town	X	X	Capability meeting; Strategy meeting
Bryce Canyon City			Phone coordination
Cannonville Town	X		No record
Escalante City			Phone coordination
Hatch Town			Strategy meeting; Phone coordination
Henrieville Town			No record
Panguitch City			Phone coordination; Email coordination
Tropic Town	X		Phone coordination; Email coordination
Iron County	X	X	Capability meeting; Strategy meeting; Data submission

Plan Participant	Kickoff Meeting	Risk Assessment Meeting	Other Documented Participation
Brian Head			Phone coordination; Survey shared
Cedar City		X	Capability meeting; Strategy meeting; Survey shared
Enoch		X	Capability meeting; Strategy meeting
Kanarraville			Not participating
Paragonah	X	X	Capability meeting; Strategy meeting
Parowan	X	X	Capability meeting
Kane County	X	X	Capability meeting; Strategy meeting; Data submission; Survey shared
Alton Town			No record
Big Water			Strategy meeting
Glendale			Strategy meeting; Phone coordination; Survey shared
Kanab			Phone coordination
Orderville			Strategy meeting
Washington County		X	Strategy meeting; Data submission
Apple Valley			Capability meeting; Strategy meeting
Enterprise			No record
Hildale			Strategy meeting

Plan Participant	Kickoff Meeting	Risk Assessment Meeting	Other Documented Participation
Hurricane	X	X	Strategy meeting
Ivins	X		Email coordination
La Verkin		X	Capability meeting; Strategy meeting
Leeds	X		No record
New Harmony Town			Email coordination
Rockville	X		Phone coordination
Santa Clara			Capability meeting; Strategy meeting; Email coordination; Survey shared
Springdale		X	Capability meeting; Strategy meeting
St. George			Capability meeting; Email coordination
Toquerville			Capability meeting; Email coordination
Virgin		X	Capability meeting; Strategy meeting
Washington City			Capability meeting; Strategy meeting; Email coordination

X indicates documented meeting attendance. Other participation includes completed or in-progress coordination recorded in the tracker through the August 25, 2026, mitigation strategy meeting. A blank or "No record" indicates no corresponding record in the reviewed tracker, not confirmed nonattendance. Kanarraville is listed for completeness but is marked not participating.[2]

[2]Five County AOG, FCAOG_HMP_Participation_Tracker_Participation_Status_8.20.26.xlsx, updated August 26, 2026, Jurisdictions, Participation_Log, and Stakeholder_Participants worksheets.

Stakeholder Engagement

The planning team sought involvement from agencies and organizations that possess technical expertise, hazard-related information, operational responsibilities, or resources relevant to mitigation planning. Stakeholders invited to participate included representatives from the Utah Division of Emergency Management, Bureau of Land Management, Southwest Utah Public Health Department, Youth Futures, Rocky Mountain Power, Central Iron County Water Conservancy District, Washington County Water Conservancy District, Five County AOG, and other regional organizations. As indicated in Table 5, documented participants included representatives from several of these organizations. Consultant team members from IEM also participated in planning meetings and facilitated discussions throughout the process.

Stakeholders participated in both the Risk Assessment Meeting and Capability Assessment Meeting and provided perspectives related to public health, utilities, emergency management, federal land management, water resources, and community resilience. Their involvement helped support identification of hazards, vulnerabilities, capabilities, and mitigation opportunities across the planning area.[3]

Table 5: Stakeholders Invited to Participate

Name	Title	Organization	Participated
	2-1-1 Contact	United Way 2-1-1 Utah	
Nathan Hofeling	Director of Admissions	Havenwood Academy	
Wendy Penrod	Executive Director	Moonridge Academy	
	Office of Admissions	Southern Utah University	
	Office of Admissions	Utah Tech University	
	Admissions Office	Rocky Vista University Utah	
Anona Yardley	Secretary	Beaver Fire Service District #1	
Michael Yardley	Chairman	Beaver County Fire District #2	
Tyler Moss	Chief Financial Officer	Beaver County Special Service District #3 Milford Area Healthcare	
Nolan Davis	Chairman	Beaver County Special Service District #5 (Solid Waste Mgmt)	
Dee Draney	Chairman	Beaver County Special Service District #6 Elk Meadows	

[3]Five County AOG, FCAOG_HMP_Participation_Tracker_Participation_Status_8.20.26.xlsx, updated August 26, 2026, Jurisdictions, Participation_Log, and Stakeholder_Participants worksheets.

Name	Title	Organization	Participated
John Carter	Board Member	Beaver County Special Service District #7 Roads	
Sheila Shotwell	Beaver County Council on Aging Contact	Beaver County Senior Services / Council on Aging	
	General Contact	Beaver County Food Network	
James Jetton	Executive Director	Iron County Care and Share	
Terryll Stromberg	Mental Health First Aid Trainer	REACH4HOPE Suicide Prevention Coalition	
Carol Hollowell	Chief Executive Officer	Switchpoint	
Sterling Trout	President	Kane County Assistance Program (Also serves Fredonia, Arizona)	
Alison Webb	Vice Chair	BIG Chamber of Commerce (Beaver, Iron, Garfield)	
Mary Carolyn Kessler	Director	Beehive LDS Schooling / Ascent Advantage Academy	
Brooklynn Cox	Assistant Field Manager	BLM Cedar City Field Office	■
Bobbie Jensen	General / Admissions Contact	Falcon Ridge Ranch	
	General Contact	Bryce Canyon National Park	
Stephanie Rainey	Iron County Council on Aging Contact	Iron County Senior Services / Council on Aging	
B. Hamilton	Planner/Services Coordinator	Iron County Building and Zoning Department	
George Colson	Emergency Manager	Iron County Emergency Management	
Mike Shurtz	Emergency Manager	Cedar City Emergency Management	
Mike Phillips	Fire Chief	Cedar City Fire Department	
	General Contact	Trinity Lutheran Church (Cedar City)	
	General Contact	USU Cedar City (Utah State University)	
Ben Dalton	Superintendent	Kane County School District	
Alan Alldredge	Emergency Manager	Kane County Office of Emergency Services	
Shannon McBride	Land Use Administrator	Kane County Land Use Authority	

Name	Title	Organization	Participated
Brett Pierson	Fire Chief	Kanab Fire Department	
Marlene Roundy	General Manager	Long Valley Sewer Improvement District	
Ray Spencer	General Manager	East Zion Special Service District	
David Long	Superintendent	Beaver County School District	
Dedi Ramba	Founder and President	The Refuge Group	
Dee Brainerd	Church Contact	United Church of Kanab-Fredonia UCC	
	General Contact	Grand Staircase–Escalante National Monument	
John Forsythe	Headmaster	Williamsburg Academy Private School	
	General Contact	Cinnamon Hills Youth Crisis Center	
	General Contact	Coral Sands Academy	
Jordan Rushton	President	Dixie Technical College	
	24-Hour Helpline	DOVE Center	
	General Contact	Elevate Church	
	General Contact	One Refugee (Utah)	
	General Contact / Main Office	Southwest Technical College	
Mike Gale	EPCD	Southwest Utah Public Health Department (SWUPHD)	■
Nathan Cloverly	Healthcare Preparedness Coordinator	SWUPHD	■
Austin Smith	Emergency Planner	SWUPHD	■
	General Contact	TURN Community Services - Cedar City	
Zach Renstrom	General Manager	Washington County Water Conservancy District	
Whit Bundy	Staff Engineer	Washington County Water Conservancy District	■
	General Contact	Youth Futures	■
	Cedar City Shelter Text Line	Youth Futures	
Jacob Browning	Washington County Council on Aging Contact	Washington County Senior Services / Council on Aging	

Name	Title	Organization	Participated
Scott Messel	Director	Washington County Community Development Department	
Jason Whipple	Emergency Manager	Washington County Emergency Management	
Joe Decker	Fire Chief	Hurricane Valley Fire and Rescue	
April Ruesch	Emergency Manager	Apple Valley Emergency Management	
Lynn Excell	Emergency Manager	Hurricane Emergency Management	
Bob Flowers	Emergency Manager	Ivins Emergency Management	
Ben Lee	Emergency Manager	La Verkin Emergency Management	
Megan Horner Orton	Emergency Manager	Rockville Emergency Management	
Darren Imlay	Emergency Manager	St. George Emergency Management	
Jim Keith	Emergency Manager	Washington City Emergency Management	
Jerica Bauer	Kane County Council on Aging Contact	Kane County Senior Services / Council on Aging	
John Dodds	Superintendent	Garfield County School District	
	Executive Director	DOVE Center	
	General Contact	Kane County Water Conservancy District	
Kaysha Sorensen	Admissions Contact	Kolob Canyon RTC	
Kimberly Cooper	Board / Program Contact	Five County Community Action Partnership	
Lance Hatch	Superintendent	Iron County School District	
	General Contact	Lava Heights Academy	
Lori Bassett	Admissions Director	Sunrise Oasis Academy of Reading	
Mandi Williams	Contact	Central Iron County Water Conservancy District	
	General Contact	SkyWest Airlines (HQ - St. George)	■

Name	Title	Organization	Participated
	General Contact	Community Presbyterian Church	
	General Contact	Grace Episcopal Church (daily hot meals / outreach partner)	
Duane Nyen	Head Administrator / Admissions Director	Trinity Lutheran Academy	
	General Contact	Saint Christopher's Catholic Church	
	General Contact	First Baptist Church of Cedar City	
Paul Cozzens	Iron County Commissioner / Library Contact	Cedar City Library / Iron County Library contact listing	
	General Contact	Cedar City Chamber of Commerce	
Shawn Christensen	President and CEO	St. George Area Chamber of Commerce	
Brennan Wood	College President	Southwest Technical College	
Mindy Benson	President	Southern Utah University	
Rick Brown	Emergency Manager/Campus Police Chief	Southern Utah University	
Shane B. Smith	University President	Utah Tech University	
Richard Holmes	Superintendent of Schools	Washington County School District	
RuthAnne Watt	Board of Health Contact	Southwest Utah Public Health Department	
Donna Chynoweth	Garfield County Council on Aging Contact	Garfield County Senior Services / Council on Aging	
Chad Justus	Emergency Manager	Garfield County Emergency Management	
Kaden Figgins	Director of Planning and Economic Development	Garfield County Department of Planning and Economic Development	
John Motley	General Manager	Ticaboo Utility Improvement District	
Chris Fullmer	General Manager	Upper Sevier River Water Conservancy District	
Mat Houston	City Manager	Panguitch City	

Name	Title	Organization	Participated
Nick Frandsen	Fire Chief	Panguitch Volunteer Fire Department	
Mike Barben	Executive Director	St. George Housing Authority	
Shawn Guzman	Public Body Contact	St. George Housing Authority	
	General Contact	Southern Utah Autism Support Group	
	General Contact	Homeless Veterans Fellowship	
Stephanie Dale	Owner / Administration	Liberty Youth Academy	
	General Contact	South Mountain Community Church - St. George	
	Admissions Office	Mountain Springs Preparatory Academy	
	Field Office	BLM Kanab Field Office	
	Field Office	BLM St. George Field Office	
	General Contact	Valley Christian Fellowship (Panguitch)	
	General Contact	Five County Association of Governments – Transportation Planning Office	
	General Contact	Westside Christian School	
	General Contact	Zion National Park	
BJ Cluff	Public Information Officer	Bryce Canyon National Park	
Brandon Ragan	Director Emergency Management, Environmental Health and Safety	Southern Utah University	
Kristen Comella	Park Manager	Snow Canyon State Park - DNR	
Candace Smith	Park Manager	Sand Hollow State Park - DNR	
Jon Allred	Park Manager	Quail Creek State Park - DNR	
Giani Julander	Park Manager	Coral Pink Sand Dunes State Park - DNR	
Jon Gibb	Director of Facilities Planning and Construction	Utah Tech University	
Brent Stanworth	Fire & Life Safety Officer	Utah Tech University	
	General Contact	St. George Regional Hospital - Intermountain Health	

Name	Title	Organization	Participated
	General Contact	Garfield Memorial Hospital - Intermountain Health	
	General Contact	Cedar City Hospital - Intermountain Health	
	General Contact	Beaver Valley Hospital	
Cedar City Ranger District Office		Dixie National Forest Supervisor's Office	
	General Contact	Dixie Power	
Tal Ehlers		Utah Transit Authority (UTA)	
Joaquin Mixco		Utah Department of Transportation (UDOT)	
Wade Skinner		Rocky Mountain Power / PacifiCorp	
Greg Davis	Emergency Manager	Rocky Mountain Power	■
Mason Kemp		UDEM Hazard Mitigation Planning Team	■
Tracie Harrison		State Floodplain Manager	■
Carly Sands		UDEM Region II Liaison	
James Combs		VOAD	
Mackenzie Jones		American Red Cross	
Kevin Barjenbruch		National Weather Service	
John Crofts		UDEM Earthquake Program	
Doug Bennett		Washington County Water Conservancy District	
Brie Thompson		Washington County Water Conservancy District	
Ryan White		Washington County Water Conservancy District	
Dave Jessop		Washington County Water Conservancy District-TSWS	
Steve Meismer		Washington County Water Conservancy District-Virgin River Program	
Darrin LaFevre		Toquerville City	

Name	Title	Organization	Participated
Scott Taylor		St. George City/St. George Canal Company	
Kyle Lovelady		La Verkin City	
Lester Dalton		Washington City	
Dallan Wadsworth		Washington City	
Tom Jorgenson		Ivins City	
Bryon Davis		Virgin Town	
Dustin Mouritsen		Santa Clara City	
Chuck Gillett		Ivins City	
Marie Owens		AE2S	
Kory Wright		Hurricane City	
Ken Richins		Hurricane City	
Seth Arens	Utah Research Information Specialist	Western Water Assessment	

In the Participated column, the filled square indicates documented participation. A blank indicates that participation has not been documented in this table; it does not establish nonparticipation.

Public Outreach

Public involvement is an important component of the hazard mitigation planning process. The planning team provided opportunities for residents, businesses, community organizations, and other interested parties to learn about hazards affecting the region and provide feedback on mitigation priorities. Outreach strategies included a digital public survey and documented website/social media distribution of survey materials. Table 6 summarizes survey distribution documented in the available participation records.

Public Engagement Approach

Table 6: Public Outreach Conducted by Each Plan Participant

Plan Participant	Description of Outreach Efforts
Kane County	Shared the public survey through website/social media posting.
Santa Clara	Shared the public survey through website/social media posting.
Glendale	Shared the public survey through website/social media posting.

Plan Participant	Description of Outreach Efforts
Cedar City	Shared the public survey through website/social media posting.
Brian Head	Shared the public survey through website/social media posting.

Public Feedback Summary

Public survey results presented at the June 30, 2026, Risk Assessment Meeting included 51 responses. Respondents identified drought, extreme heat, wildfire, and high winds as leading concerns and emphasized public education and water conservation. Homes, neighborhoods, agricultural areas, critical infrastructure, and vulnerable populations were identified as at risk.

4 Risk Assessment

Methodology

The risk assessment evaluates the hazards that threaten the Five County AOG planning area and the potential impacts on people, property, infrastructure, the economy, natural resources, and community lifelines. The assessment was developed using guidance from the FEMA Local Mitigation Planning Policy Guide and draws on available local, state, and federal data sources identified during plan development. The methodology combines historical hazard information, geospatial analysis, stakeholder input, demographic and development data, and hazard-specific studies to assess risk across the planning area.

The assessment follows a four-step process:

1. Identify hazards that may affect the planning area.
2. Inventory assets that may be exposed to identified hazards.
3. Evaluate hazard probability, extent, and vulnerability.
4. Estimate potential impacts and losses where data and methodologies are available.

Because the Five County AOG planning area includes numerous jurisdictions with varying populations, topography, land uses, and development patterns, risk is not uniform throughout the region. The base plan provides a regional evaluation of hazards and vulnerabilities, while jurisdiction-specific annexes provide additional information regarding local exposure, development trends, critical facilities, and unique vulnerabilities.

Hazard Identification

Hazard identification is the first step in the risk assessment process. Hazards were identified through a comprehensive review of historical events, state and local planning documents, FEMA guidance, National Risk Index (NRI) datasets, previous hazard mitigation plans, stakeholder input, and public outreach efforts. Planning participants reviewed potential hazards and evaluated their relevance to the Five County AOG region based on historical occurrence, geographic applicability, future conditions, and potential consequences.

The planning team considered natural hazards for inclusion in the FEMA-approved mitigation plan. Human-caused hazards may be discussed for local planning purposes but are not the basis of FEMA approval under 44 CFR § 201.6. Natural hazards were retained for evaluation when available information indicated that they could affect the planning area. The basis for including or omitting each hazard is documented in this section and the jurisdiction-specific assessments.

Asset Identification

Understanding what is exposed to hazards is a critical component of risk assessment. Assets evaluated during this planning process include population, buildings, critical facilities, infrastructure systems, economic assets, environmental resources, and community lifelines. Asset inventories were developed using data from participating jurisdictions, federal and state datasets, geographic information systems (GIS), and previous planning efforts.

Assets considered in this assessment include the following:

- Population and vulnerable populations
- Residential, commercial, industrial, agricultural, and public buildings
- Critical facilities such as hospitals, schools, emergency response facilities, government buildings, dams, and utility facilities
- Transportation infrastructure, including highways, bridges, airports, and local road networks
- Water, wastewater, communications, electrical, and energy infrastructure
- Public lands, natural resources, watersheds, and recreation assets
- FEMA Community Lifelines, including Safety and Security; Food, Hydration, Shelter; Health and Medical; Energy; Communications; Transportation; Hazardous Materials; and Water Systems

Where available, GIS analysis was used to compare hazard areas with exposed populations and assets to better understand potential impacts and concentrations of risk throughout the planning area.

Potential Loss Estimates

Potential loss estimates provide an indication of the economic and physical impacts that could result from hazard events. Because hazard characteristics, available datasets, and modeling capabilities differ by hazard, loss estimation methodologies vary throughout this risk assessment.

Where available, loss estimates were derived from FEMA and NRI datasets and datasets from state agencies and local jurisdictions. For hazards with established loss methodologies, available estimates may include the following:

- Potential building damage
- Population exposure
- Critical facility exposure
- Infrastructure impacts
- Agricultural losses
- Economic disruption
- Environmental impacts
- Community lifeline disruptions

For hazards where quantitative loss estimates are not available, qualitative assessments were developed using historical impacts, documented disaster records, known vulnerabilities, and input from participating jurisdictions. As a result, loss estimates presented throughout this plan should be considered planning-level estimates intended to support mitigation decision-making rather than precise predictions of future damages.

Calculating Probability

Probability refers to the likelihood that a hazard will occur within a specified period. Probability estimates were developed, where supported by available information, using historical records, recurrence intervals, scientific literature, state and federal datasets, predictive models, and local knowledge provided by participating jurisdictions. Disaster declarations were used as evidence of past impacts, not as a complete record of hazard occurrence.

Because hazards vary considerably in frequency and predictability, probability determinations were made on a hazard-by-hazard basis using the best available information. For example, probabilities for weather-related hazards may rely heavily on historical event records, while probabilities for earthquakes may incorporate geologic studies and recurrence interval estimates. Future conditions, including changing climate patterns, prolonged drought, population growth, and development trends, were also considered where appropriate.

To improve consistency across hazard profiles, probability is categorized as Highly Likely, Likely, Occasional, or Unlikely using the classifications shown in Table 7.

Table 7: Probability Categories

Probability Category	Description
Highly Likely	Expected to occur one or more times per year (average recurrence interval of one year or less), based on the source and period of record identified in the applicable hazard profile
Likely	Expected to occur less than once per year but at least once in 10 years (annual probability of at least 10 percent but less than 100 percent), based on the source and period of record identified in the applicable hazard profile
Occasional	Expected to occur less than once in 10 years but at least once in 100 years (annual probability of at least 1 percent but less than 10 percent), based on the source and period of record identified in the applicable hazard profile
Unlikely	Expected to occur less than once in 100 years (annual probability of less than 1 percent), or available information is insufficient to support a higher category

National Risk Index

FEMA NRI data provides a national baseline for comparing relative natural hazard risk using expected annual loss, social vulnerability, and community resilience information at the county and census tract levels. FEMA's December 2025 NRI v1.20 dataset, released in January 2026, is available through the Resilience Analysis and Planning Tool and as downloadable data. NRI data provided an important baseline resource during development of this risk assessment and was used to help identify applicable hazards, understand regional trends, and support evaluation of potential impacts.

The NRI was not used as the sole basis for determining hazard significance. Rather, NRI findings were reviewed alongside local historical records, stakeholder input, jurisdictional knowledge, state hazard assessments, and hazard-specific technical studies. This approach helps the risk assessment reflect local conditions and hazards that may not be fully represented by a national baseline dataset. Table 8 documents how NRI hazards correspond to hazards addressed in this plan.

Table 8: NRI Hazard Review

Hazard	Included	Explanation
Avalanche	No	Although portions of the planning area contain high-elevation terrain and seasonal snowpack, avalanche risk is generally limited to remote backcountry areas and does not pose a significant threat to

Hazard	Included	Explanation
		populated areas, critical facilities, or infrastructure. It was not identified as a planning-priority hazard for participating jurisdictions.
Coastal Flooding	No	The Five County AOG region is located in southwestern Utah and has no coastline, tidal influences, estuaries, or exposure to storm surge. Coastal flooding is not applicable to the planning area.
Cold Wave	Yes	This hazard was included as Winter Storms. Extreme cold temperatures, heavy snow, and winter weather can affect transportation, utilities, agricultural operations, and vulnerable populations throughout portions of the planning area.
Drought	Yes	Drought is a recurring regional hazard that affects water supplies, agriculture, livestock operations, natural resources, recreation, and wildfire conditions throughout the five-county region.
Earthquake	Yes	The planning area is influenced by regional seismic sources associated with the Basin and Range Province and nearby fault systems. Earthquakes have occurred historically and remain capable of causing significant impacts.
Hail	Yes	Hail events occur throughout the region, particularly during spring and summer thunderstorms, and can damage structures, vehicles, crops, livestock, and solar infrastructure.
Heat Wave	Yes	This hazard was included as Extreme Heat. High temperatures occur annually and present risks to public health, infrastructure, agriculture, outdoor recreation, and energy demand.
Hurricane	No	The Five County AOG region is located far inland and is not exposed to hurricanes. Remnants of tropical systems may contribute to heavy rainfall and flooding but are addressed under the Flooding hazard profile.
Ice Storm	No	Freezing rain and significant ice accumulation events are uncommon within the planning area. Winter weather impacts are primarily associated with snowfall, blowing snow, cold temperatures, and winter storms rather than ice storms. Ice impacts are addressed under Winter Storms.
Landslide	Yes	Mountainous terrain, steep slopes, wildfire burn scars, intense precipitation, and seismic activity create conditions conducive to landslides, rockfalls, debris flows, and slope failures throughout parts of the region.
Lightning	Yes	This hazard was included as Thunderstorms and Lightning. Lightning occurs regularly during convective and monsoonal storms and poses threats to life safety, utility systems, recreation users, and structures and can ignite wildfires.

Hazard	Included	Explanation
Riverine Flooding	Yes	This hazard was included as Flooding. Flood hazards include riverine flooding, flash flooding, alluvial fan flooding, flooding in washes and canyon systems, and post-wildfire flooding and debris flows.
Strong Wind	Yes	This hazard was included as Damaging Winds. High winds, thunderstorm outflows, microbursts, and frontal wind events occur throughout the planning area and can damage structures, utilities, transportation networks, and agricultural resources.
Tornado	Yes	Although uncommon and generally weak, tornadoes have occurred in Utah and within the planning region. Due to their potential for localized damage and limited warning time, tornadoes were retained as a hazard of concern.
Tsunami	No	The planning area is inland and is not exposed to coastal tsunami inundation.
Volcanic Activity	No	Volcanic activity was not retained as a planning-priority hazard. There are no active volcanoes in the planning area.
Wildfire	Yes	Wildfire is a significant regional hazard due to extensive wildland vegetation, drought conditions, wildland-urban interface development, recreational use, and the potential for large, destructive fires.
Winter Weather	Yes	This hazard was included as Winter Storms. Snow, blowing snow, extreme cold, and winter storm conditions regularly affect portions of the region, particularly at higher elevations and in Beaver, Garfield, and Iron Counties.

How to Read the Hazard Profiles

Each hazard profile follows a standardized format to allow consistent comparison across hazards and jurisdictions. The profiles summarize hazard characteristics, historical impacts, future conditions, and vulnerabilities throughout the planning area. The information presented in each profile should be considered alongside jurisdiction-specific annexes, which provide additional details regarding local exposure, development patterns, and community concerns.

Each hazard profile contains the following elements:

- **Description:** Provides an overview of the hazard and explains the physical processes or conditions that cause the hazard to occur.
- **Location:** Describes the geographic areas where impacts are most likely to occur and identifies areas of elevated exposure within the planning area.
- **Magnitude and extent:** Describes the magnitude, severity, or intensity of a hazard event and the potential consequences associated with larger events.

- **Previous Occurrences:** Summarizes notable historical occurrences, including disasters, significant local events, and documented impacts.
- **Probability of Future Occurrences:** Evaluates the likelihood of future hazard occurrence and discusses trends that may influence future risk.
- **Vulnerability Assessment:** Identifies populations, buildings, infrastructure, community lifelines, natural resources, and economic sectors that may be affected by the hazard.
- **Impact Analysis and Cascading Impacts:** Describes the consequences a hazard may have on life safety, property, infrastructure, government services, environmental resources, and economic activity.

Dam Failure

A dam is a barrier constructed to impound or divert water. Dams and reservoirs support water supply, irrigation, flood-risk reduction, hydropower, recreation, and other public and private purposes. In Utah, winter snowpack is a major source of water supply, and reservoirs store runoff for use when natural streamflow does not match demand.[4] Some facilities generate hydropower by routing water through turbines, and many reservoirs support boating, fishing, swimming, and other recreation.[5]

Dams also may reduce flood risk by storing runoff and releasing water in a controlled manner. Detention and flood-control structures may remain dry or retain little water except during runoff events. Their performance depends on design, operation, maintenance, available storage, and the magnitude of inflow.

Although dams provide substantial benefits, failure or misoperation can release stored water and cause rapid, destructive flooding downstream. Potential causes and contributing factors include the following:

- Internal erosion caused by embankment or foundation seepage, piping, vegetation, or animal burrows
- Extreme inflow, inadequate spillway or outlet capacity, and overtopping
- Design or construction deficiencies
- Improper operation, inadequate maintenance, or malfunctioning components
- Earthquake-related ground shaking or deformation
- Intentional physical or cyber-related disruption
- Failure or emergency release from an upstream dam on the same waterway

Downstream flooding also may result from operational or emergency releases made to preserve dam safety during high inflow. A controlled release is not a dam failure, but it still can affect downstream people, property, infrastructure, and access routes.

[4]Utah Division of Water Resources, "Snowpack," accessed October 9, 2026, https://water.utah.gov/snowpack/.
[5]Utah Division of Water Resources, "Dam Safety," "Why Do We Have Dams?" accessed October 9, 2026, https://water.utah.gov/dam-safety/.

The consequences of a dam incident or failure depend on the volume and rate of release, breach progression, warning time, downstream topography, channel geometry, and the number and type of exposed people and assets. Deep, high-velocity flow in confined canyons can be especially destructive. As flow spreads across broader valleys, depth and velocity may decrease, although inundation can extend over a wider area.

Dam incidents are commonly described as hydrologic, or "rainy-day," events and nonhydrologic, or "sunny-day," events. Hydrologic failures may occur when extreme inflow exceeds spillway or outlet capacity and causes overtopping or other distress. Sunny-day failures occur without a concurrent flood and may result from internal erosion, seepage, structural defects, operational problems, or other mechanisms. Either type can develop rapidly and provide limited warning.

The Utah State Engineer, who also serves as director of the Utah Division of Water Rights, regulates dam safety and oversees the state's Dam Safety Section. The Dam Safety Section regulates nonfederal dams subject to state jurisdiction and provides technical review of dam design, construction, alteration, operation, maintenance, and inspection. The Utah Division of Water Resources, an affiliate agency, supports dam-safety projects through funding and project oversight but is not the state's dam-safety regulator. Dam owners remain responsible for safely operating and maintaining their facilities and for completing required repairs or upgrades. Federal agencies regulate or manage federal dams under applicable federal requirements.

Dam ownership, jurisdiction, hazard-potential classification, condition information, and inspection status are distinct attributes. This profile uses publicly releasable inventory and mapping information for planning purposes and does not treat hazard-potential classification or inspection frequency as evidence that a particular dam is unsafe or likely to fail.

Location

The Utah Division of Water Rights Dam Safety Section maintains dam inventory information. Figures 1 through 5 show mapped dam locations and available planning-level inundation information in Beaver, Garfield, Iron, Kane, and Washington Counties. The point symbols portray the condition-rating categories shown in the map legend, while the shaded areas portray available dam-inundation scenarios. Condition rating, hazard-potential classification, and inspection status are separate concepts. Because the source inventory includes different record types and the map products do not support a reliable reconciliation of all inventory-status categories, the captions do not report county totals. The maps identify the regional location of the hazard; jurisdiction-specific exposure and vulnerability should be read with the applicable annex.

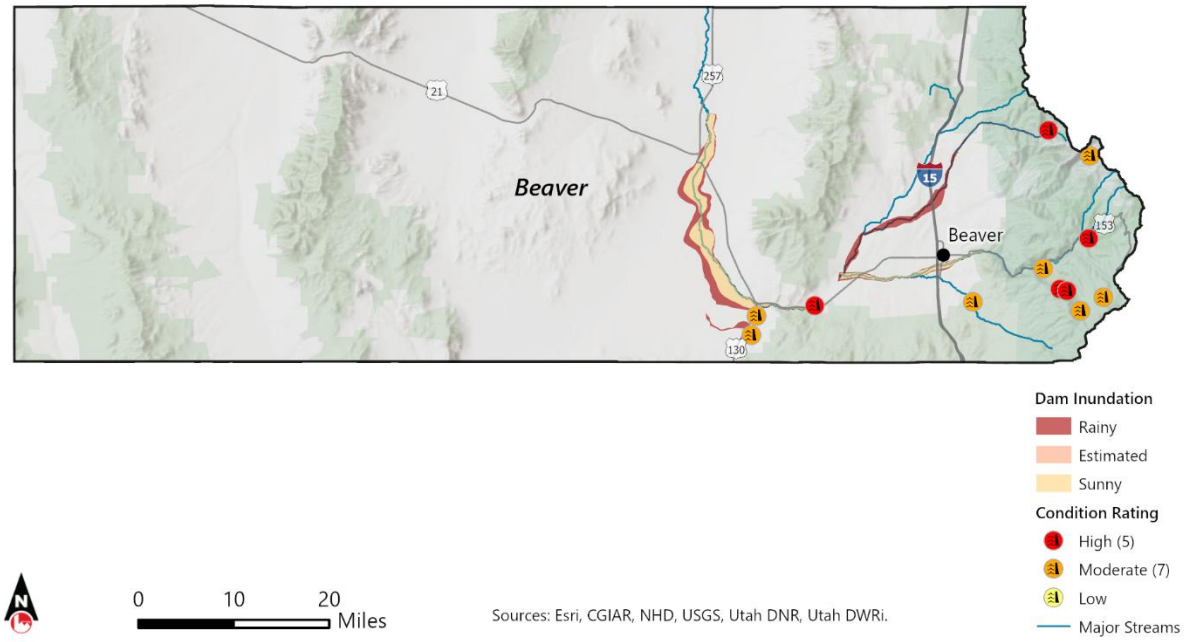


Figure 1: Beaver County Dam Locations and Available Inundation Areas

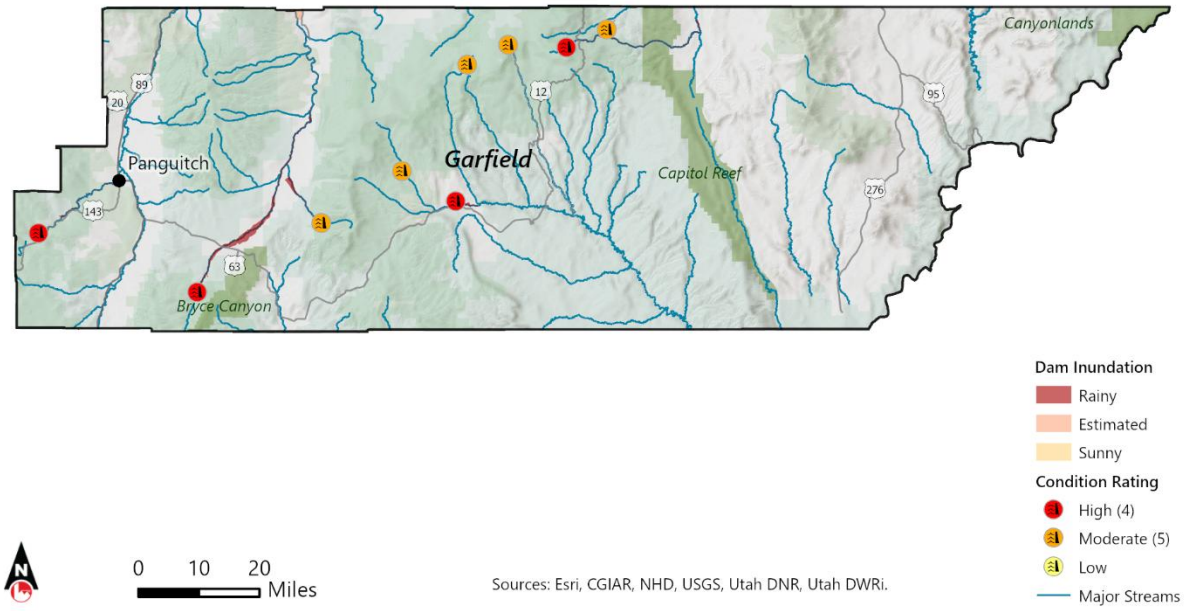


Figure 2: Garfield County Dam Locations and Available Inundation Areas

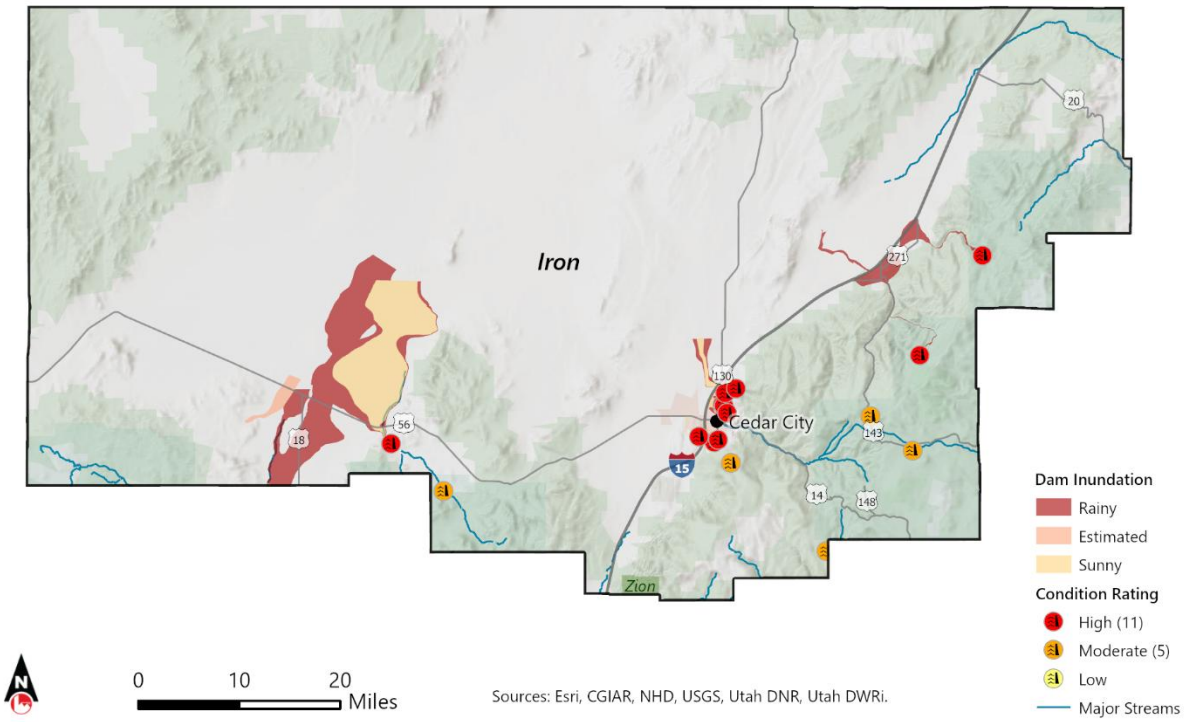


Figure 3: Iron County Dam Locations and Available Inundation Areas

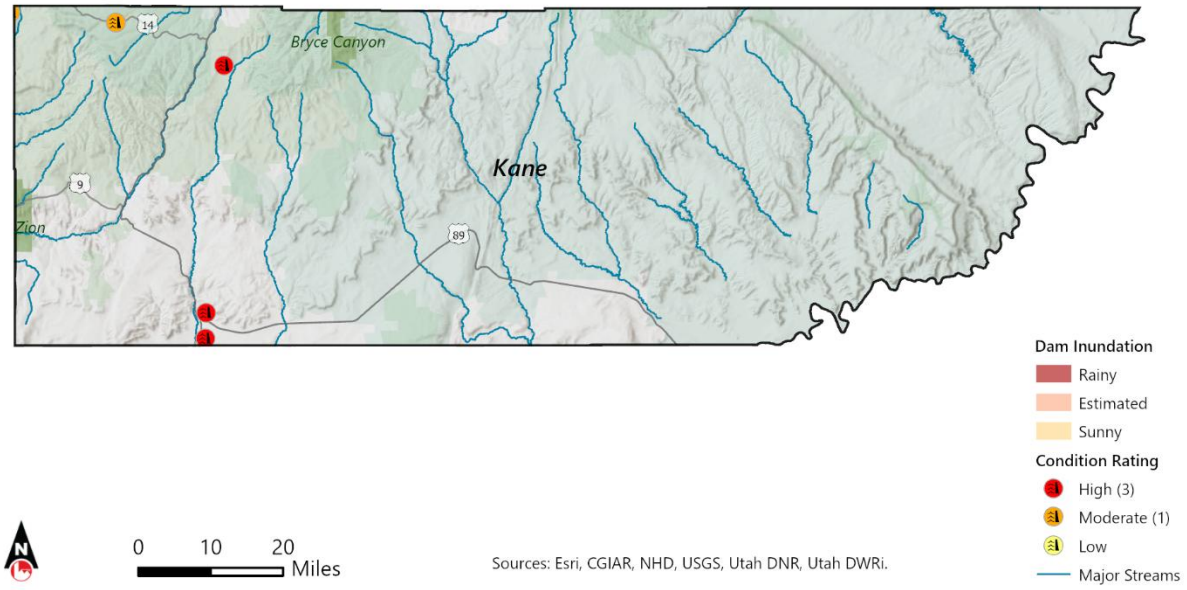


Figure 4: Kane County Dam Locations and Available Inundation Areas

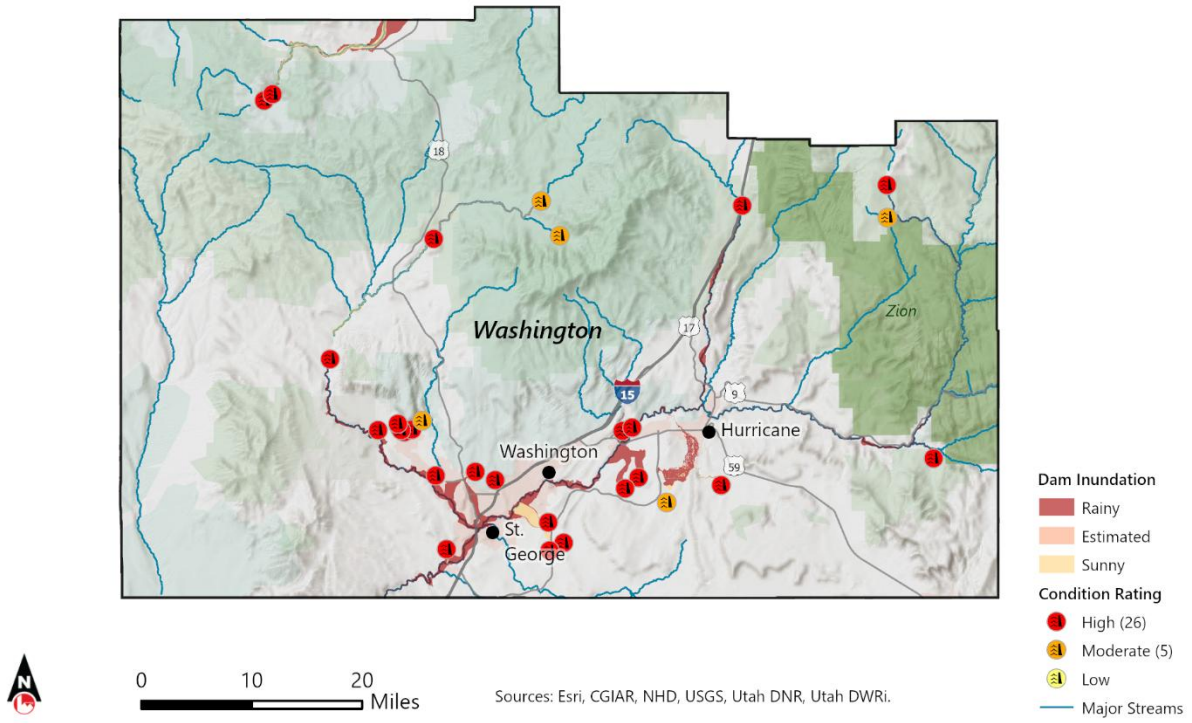


Figure 5: Washington County Dam Locations and Available Inundation Areas

The mapped inundation areas represent modeled scenarios based on assumptions concerning breach formation, reservoir level, routing, and downstream conditions. They do not depict every possible dam incident or operational release and should not be interpreted as a prediction that a dam will fail. Publicly releasable map information indicates that potential downstream effects are concentrated along reservoir outlets, stream channels, washes, canyon corridors, and adjoining low-lying areas. More detailed emergency action plans, breach studies, and inundation products may contain sensitive information and should be incorporated or summarized only in coordination with the Utah Division of Water Rights, dam owners, and emergency-management officials.

Magnitude and Extent

Utah and federal dam-safety practice classify dams by hazard potential according to the anticipated consequences of failure or misoperation. Hazard-potential classification is independent of a dam's physical condition and does not estimate failure probability.

- **High-hazard-potential dams** are those for which failure or misoperation would probably cause loss of human life.
- **Significant-hazard-potential dams** are those for which failure or misoperation is not expected to cause loss of human life but could cause economic loss, environmental damage, disruption of lifeline facilities, or other substantial impacts.

- **Low-hazard-potential dams** are those for which failure or misoperation is not expected to cause loss of human life and would result in low, generally limited losses.

The consequences of a dam incident may range from localized erosion or short-term service disruption to rapid inundation with life-safety consequences. Relevant measures of extent include potential inundation depth and velocity, arrival time, warning time, breach discharge, geographic reach, population at risk, and the number and function of exposed structures, critical facilities, infrastructure systems, and community lifelines. These measures are specific to the dam and the scenario. The available regional information does not support a single quantitative magnitude value for all dams in the planning area.

Previous Occurrences

Documented failures and serious incidents provide context for warning, evacuation, emergency response, and long-term risk reduction. The following events are included because authoritative sources identify effects within the planning area. Events for which the available record does not support a sufficiently reliable facility name, cause, impact estimate, or declaration relationship are omitted rather than presented as confirmed occurrences.

- **Quail Creek Dike Failure (1989):** Quail Creek Reservoir in Washington County includes a main dam and a separate dike. The dike failed shortly after midnight on January 1, 1989. The Association of State Dam Safety Officials case study attributes the failure to foundation seepage associated with design and construction deficiencies.[6]

  Contemporary case-study information indicates that warning and evacuation occurred before the breach reached downstream development, preventing loss of life. The flooding damaged homes, apartments, roads, bridges, utilities, and agricultural property. FEMA issued Major Disaster Declaration DR-820-UT for the event. The incident prompted changes to Utah dam-safety oversight and remains a regional example of the importance of design review, seepage monitoring, warning, and evacuation planning.[7]

- **Panguitch Lake Dam Incident (2024):** The original Panguitch Lake Dam in Garfield County was constructed in 1872. The dam was raised with a concrete cap in 1942, buttressed with zoned earthfill and capped with grouted riprap in 1975, and received a replacement outlet gate and controls in 2011. In April 2024, ice damaged the upper portion of the dam and raised concern about an uncontrolled release. Local, state, and federal officials; engineers; emergency responders; the dam owner; and the community implemented the emergency action plan, lowered the reservoir, stabilized the structure, constructed an emergency spillway, closed affected transportation access, and prepared downstream notification and evacuation measures. These actions prevented an uncontrolled release. The incident

[6] Association of State Dam Safety Officials, "Quail Creek Dike (Utah, 1989)," Dam Failures and Lessons Learned case study.
[7] U.S. Geological Survey, *Flood on the Virgin River, January 1989, in Utah, Arizona, and Nevada*, Water-Resources Investigations Report 94-4159 (1995).

subsequently led to construction of a replacement dam downstream of the original structure. This event is treated as a serious dam incident and near-failure, not as a completed breach.[8]

Table 9: Previous Federal Dam-Failure Disaster Declaration

Year	Declaration Number	Declaration Type	Title and Description
1989	DR-820-UT	Federal	Quail Creek Dike Failure and Flooding

Probability of Future Occurrences

Using the plan-wide probability categories, dam failure is rated **Unlikely** at the regional level. The available record documents a small number of failures or serious incidents over more than a century, and available public information does not support a defensible annualized regional failure rate. Under the plan methodology, the Unlikely rating applies when an event is expected less often than once in 100 years or when available information is insufficient to support a higher category. This regional rating does not characterize the condition or likelihood of failure of any individual dam and does not reduce the significance of potential consequences from high-hazard-potential dams.

Future risk may change through both loading and consequence pathways. Extreme precipitation, rapid snowmelt, post-wildfire runoff and debris, seismic loading, aging components, operational conditions, and deferred maintenance can affect dam performance, but the direction and magnitude of change are facility specific. Population growth and development downstream can increase the population and assets exposed even if the probability of failure does not change, a process often described as hazard creep. Future dam-safety evaluations should use current hydrologic and seismic criteria, dam-specific performance studies, updated precipitation information, and current downstream-development data. This profile does not infer a county-scale change in failure probability from regional climate projections alone.

Vulnerability Assessment

This planning-level assessment identifies people, structures, critical facilities, infrastructure, economic assets, natural and cultural resources, and community activities that may be susceptible to dam failure or an uncontrolled release. Exposure is concentrated within mapped inundation areas and plausible downstream flow paths, including reservoir outlets, stream channels, washes, canyon corridors, low-lying valley areas, and transportation crossings. Actual consequences would depend on the dam and incident scenario, including breach progression, warning and arrival time, depth and velocity, debris, route availability, and the location and characteristics of exposed populations and assets. Figures 1 through 5 and the applicable jurisdictional annexes should be used with current dam-specific emergency information where authorized and available.

[8] Association of State Dam Safety Officials, "Panguitch Lake Dam (Utah, 2024)," Dam Failures and Lessons Learned case study.

BEAVER COUNTY

Beaver County's dam-failure vulnerability is concentrated downstream of the dams and available inundation areas shown in Figure 1. People who live, work, travel, farm, or recreate along affected waterways may face rapidly changing conditions, limited warning, and difficult evacuation, particularly in confined channels or locations with few alternate routes. Potentially exposed assets include residences, agricultural and accessory structures, businesses, public facilities, and recreation sites; susceptibility varies with inundation depth and velocity, scour, debris, construction type, elevation, and local topography.

Roads, bridges, culverts, irrigation works, water and wastewater components, power and communications facilities, and emergency-access routes may be damaged or made inaccessible. Direct losses could extend to crops, equipment, public infrastructure, and private property, while closures or utility interruptions could affect emergency response, commerce, agriculture, recreation, and access to services beyond the inundated area. Streams, riparian areas, habitat, historic properties, archaeological resources, and other culturally important places may also be affected by erosion, channel change, sediment, debris, or contamination.

Cascading impacts: Flooding, rapid snowmelt, wildfire-related runoff and debris, landslides, or earthquakes could initiate or worsen a dam emergency. A release could then sever transportation and utility links, isolate rural areas, impede evacuation, and mobilize sediment, ash, sewage, fuel, or agricultural materials. Damage to reservoir storage, irrigation conveyance, or access infrastructure could prolong effects on water supply, agriculture, recreation, and fire-suppression capability after floodwaters recede.

Changes in development: New residential, agricultural, commercial, or infrastructure development within downstream flow paths can increase the number of people and assets at risk even if the probability of dam failure is unchanged. Redevelopment, road improvements, utility extensions, and changes in recreational use may also alter evacuation demand and consequence estimates. Beaver County and participating jurisdictions should use current inundation information, land-use data, building inventories, and emergency routes when reviewing development and should coordinate updates with dam owners and the Utah Division of Water Rights.

GARFIELD COUNTY

Garfield County's vulnerability is concentrated along the dam locations, available inundation areas, reservoir outlets, and downstream waterways shown in Figure 2. Residents, visitors, travelers, recreationists, and workers may be exposed, and seasonal visitation or unfamiliarity with local warning and evacuation procedures can complicate protective actions. Homes, businesses, public buildings, agricultural improvements, and recreation facilities in downstream corridors may be damaged by inundation, high-velocity flow, scour, sediment, and debris.

Potentially affected infrastructure includes highways and local roads, bridges, culverts, water and wastewater systems, irrigation facilities, power and communications assets, and emergency-access routes. Closures in canyon or rural settings may lengthen detours, delay response, and temporarily restrict access

to communities, public lands, or visitor destinations. The April 2024 Panguitch Lake Dam incident demonstrates the importance of emergency action planning, reservoir drawdown capability, transportation control, downstream notification, and coordinated local, state, federal, owner, and community response.

Cascading impacts: Severe storms, rapid snowmelt, ice, wildfire-related runoff and debris, landslides, or earthquakes may compound dam-safety concerns. A dam emergency could close key routes, interrupt utilities and communications, isolate communities or recreation areas, and mobilize sediment, ash, sewage, fuel, or other contaminants into downstream waters. Loss of storage or conveyance capacity could also affect water supply, irrigation, recreation, aquatic resources, and fire-response capability.

Changes in development: Growth or redevelopment downstream of dams can increase population-at-risk, property exposure, traffic demand, and evacuation complexity without changing the likelihood of failure. Additional visitor accommodations, recreation use, utilities, and roadway improvements may create both new exposure and opportunities for safer access and warning. Garfield County and participating jurisdictions should periodically compare current development, seasonal occupancy, critical facilities, and evacuation routes with authorized inundation information and incorporate findings into land-use review and emergency planning.

IRON COUNTY

Iron County's vulnerability is concentrated within the dam locations, available inundation areas, drainage corridors, and downstream low-lying areas shown in Figure 3. Exposed populations may include residents, workers, students, travelers, and recreationists, including people who need transportation, medical, mobility, language, or other assistance to evacuate. Residential, commercial, institutional, agricultural, and accessory structures may be susceptible to inundation, velocity, scour, erosion, sediment, and debris, with consequences shaped by local terrain and warning time.

Critical exposure may include roads and bridges, emergency-response and medical access, schools and government facilities, water and wastewater systems, irrigation infrastructure, energy and communications assets, and other community lifelines. Damage or loss of access could delay warning, evacuation, response, and restoration while disrupting employment, education, commerce, agriculture, and recreation. Streams, riparian areas, habitat, historic properties, archaeological sites, and cultural landscapes in downstream corridors may experience erosion, deposition, contamination, or physical loss.

Cascading impacts: Extreme precipitation, rapid snowmelt, wildfire and post-wildfire runoff, landslides, or seismic shaking may contribute to a dam emergency. Released water and debris could then impair transportation, power, communications, water, wastewater, and hazardous-materials management, producing simultaneous lifeline disruptions and complicating evacuation. Reduced reservoir or conveyance function could create longer-term effects on municipal and agricultural water service, recreation, and wildfire response.

Changes in development: Continued residential, commercial, institutional, and infrastructure development downstream of dams may increase exposure and emergency-management demands even

where dam condition and failure probability remain unchanged. Changes in density, road networks, utility service, and occupancy can alter both consequence estimates and evacuation times. Iron County and participating jurisdictions should use updated parcel, structure, population, critical-facility, and transportation data when reviewing development in potential inundation corridors and when updating emergency procedures.

KANE COUNTY

Kane County's vulnerability is concentrated along the dam locations, available inundation areas, stream channels, washes, canyon corridors, and reservoir outlets shown in Figure 4. Residents, visitors, recreationists, workers, and travelers may be exposed, sometimes in remote areas where warning coverage, communications, route redundancy, and emergency access are limited. Buildings, campgrounds, visitor facilities, agricultural improvements, and public infrastructure in downstream flow paths may be affected by deep or fast-moving water, scour, erosion, sediment, and debris.

Roads, bridges, culverts, water and wastewater components, energy and communications systems, and emergency-access routes may be directly damaged or rendered inaccessible. Disruption may affect public safety, tourism and recreation access, local commerce, agriculture, and delivery of essential services beyond the inundated area. Natural and cultural resources—including riparian habitat, springs, archaeological sites, historic properties, trails, and culturally important landscapes—may be vulnerable to erosion, channel change, deposition, contamination, or physical loss.

Cascading impacts: Flash flooding, severe storms, rapid snowmelt, wildfire-related runoff and debris, landslides, or earthquakes may increase loading or complicate dam operations. A release could isolate remote communities and recreation areas, close canyon or highway routes, interrupt communications and utilities, and transport sediment, ash, sewage, fuel, or hazardous materials. Loss of reservoir storage or access may also affect water availability, recreation, ecosystem conditions, and fire-suppression capability during recovery.

Changes in development: New homes, visitor facilities, transportation improvements, utilities, and recreation use within downstream corridors can increase the number and diversity of people and assets requiring warning and evacuation. Seasonal and transient populations may change faster than permanent-population estimates indicate. Kane County and participating jurisdictions should compare current land use, visitor patterns, critical facilities, and access routes with authorized inundation information and avoid relying on older mapping or population data when evaluating proposed development.

WASHINGTON COUNTY

Washington County's vulnerability is concentrated downstream of the dams, reservoir outlets, washes, river corridors, and available inundation areas shown in Figure 5. Residents, workers, visitors, motorists, and recreationists may be exposed, and short-warning conditions could require rapid notification and evacuation. Residential and commercial development, public facilities, agricultural property, utilities, and

recreation assets in downstream flow paths may be susceptible to inundation, velocity, scour, erosion, sediment, and debris.

The 1989 Quail Creek Dike failure illustrates the county's potential for damage to homes, apartments, roads, bridges, utilities, and agricultural property, while also demonstrating the life-safety value of warning and evacuation. Current exposure may include emergency facilities, transportation routes, water and wastewater systems, energy and communications assets, and other community lifelines. Disruption could affect public safety, commerce, tourism, housing, agriculture, and essential services well beyond the directly inundated area.

Cascading impacts: Extreme precipitation, rapid runoff, wildfire-related debris, landslides, earthquakes, or upstream operational conditions could initiate or intensify a dam emergency. A breach or emergency release could damage key roads and utilities, impede evacuation, create hazardous rescue conditions, and mobilize sediment, ash, sewage, fuel, or agricultural chemicals. Loss of reservoir storage, conveyance, power, or access could produce continuing effects on water supply, irrigation, recreation, economic activity, and fire response.

Changes in development: Population growth and continued residential, commercial, and infrastructure development downstream of dams can substantially increase consequences even if failure probability remains unchanged. Greater density, traffic, utility dependence, and visitor activity may increase warning, evacuation, sheltering, and recovery demands, while new roads and communications systems may improve response if designed with redundancy. Washington County and participating jurisdictions should routinely reconcile current development, critical facilities, population and occupancy, and evacuation routes with authorized inundation information and dam emergency plans.

Damaging Winds

Damaging wind includes non-tornadic winds capable of causing damage, including thunderstorm straight-line winds, downbursts, microbursts, and synoptic or pressure-gradient wind events. Because National Oceanic and Atmospheric Administration (NOAA) Storm Events categories use different reporting thresholds, this profile relies on the event categories and definitions identified in the supporting datasets rather than a single universal wind threshold.

NOAA uses "straight-line wind" for thunderstorm wind not associated with tornado rotation. These winds commonly develop when a thunderstorm downdraft reaches the ground and spreads outward, although several convective processes can produce damaging winds.

People in thunderstorm-prone areas of Utah may be exposed to straight-line winds generated by thunderstorm outflow. Manufactured homes and other lightly constructed or inadequately anchored structures are especially susceptible to wind damage, structural failure, and windborne debris.

The following types of wind have the potential to cause damage (tornadic winds are profiled separately):

- **Thunderstorm Winds or Straight-Line Winds:** All winds produced by a thunderstorm not associated with the rotation of tornadoes. Straight-line winds are responsible for most thunderstorm wind damage, and speeds can exceed 100 mph.
- **Downburst:** A strong downdraft current of air from a cumulonimbus cloud, often associated with intense thunderstorms. Downdrafts may produce damaging winds at the surface. A downburst can cause damage equivalent to a strong tornado.
- **Microburst:** A downdraft with an outflow area less than 2½ miles wide and peak winds lasting less than five minutes. Microbursts may induce dangerous horizontal and/or vertical wind shears, which can adversely affect aircraft performance and cause property damage.
- **Dry Microburst:** A microburst with little or no precipitation reaching the earth. On the ground, the only visible sign might be a dust plume or a ring of blowing dust beneath an area.
- **Derecho:** Pronounced similar to "deh-REY-cho" in English, this is a widespread, long-lived windstorm that is associated with a band of rapidly moving showers or thunderstorms. Although a derecho can produce destruction similar to that of tornadoes, the damage typically is directed in one direction along a relatively straight swath. As a result, the term "straight-line wind damage" sometimes is used to describe derecho damage. If the wind damage swath extends more than 240 miles (about 400 kilometers) and includes wind gusts of at least 58 mph (93 km/h) along most of its length, then the event may be classified as a derecho.[9]

Location

Damaging wind events affect all five counties in the planning area, with spatial patterns influenced by topography, land cover, and development.

- In Beaver County, damaging winds most frequently occur across open valley floors and along major transportation corridors where unobstructed terrain allows strong pressure-gradient winds and frontal systems to accelerate, particularly during spring and fall transition seasons.
- In Garfield County, damaging winds are widely distributed but are most pronounced in higher-elevation plateaus, canyon corridors, and exposed communities where terrain-driven funneling increases wind speeds during frontal passages and windstorm outflows.
- In Iron County, damaging winds are most pronounced across the Cedar Valley, along Interstate 15 and other exposed north–south transportation corridors, and near canyon outlets and higher terrain where frontal winds, pressure-gradient winds, and thunderstorm outflows can intensify.
- In Kane County, damaging winds occur across exposed plateaus, desert basins, mesas, and canyon corridors, with localized acceleration near canyon openings and open travel routes; arid surfaces also increase the potential for blowing dust and reduced visibility.

[9] National Oceanic and Atmospheric Administration, National Severe Storms Laboratory, "Severe Weather 101 Thunderstorms, Thunderstorm Types," 2026, https://www.nssl.noaa.gov/education/svrwx101/thunderstorms/types/.

- In Washington County, damaging winds affect developed valleys, desert basins, canyon mouths, and major transportation corridors, including the Interstate 15 corridor, where thunderstorm outflows, downbursts, and regional pressure-gradient winds can affect densely developed communities and exposed infrastructure.

Magnitude and Extent

Damaging winds occur throughout southwestern Utah and can disrupt roads, utilities, communications, structures, agriculture, and emergency access. Typical effects include downed trees and power lines, roof and siding damage, windborne debris, reduced visibility from blowing dust, roadway delays or closures, and power outages. Older adults, people who rely on electrically powered medical equipment, residents of manufactured housing, travelers, outdoor recreation users, and people in remote areas may experience disproportionate consequences when outages or access disruptions occur.

The Beaufort Wind Scale (see Table 10) was developed to estimate wind speeds based on their effects via visual observations. Initially used by sailors based on sea conditions, it is still in use today to estimate wind strengths.

Table 10: Beaufort Wind Scale[10]

Force	Speed (mph)	Speed (knots)	Description	Specifications
0	0–1	0–1	Calm	Calm; smoke rises vertically.
1	1–3	1–3	Light Air	Direction of wind shown by smoke drift, but not by wind vanes.
2	4–7	4–6	Light Breeze	Wind felt on face; leaves rustle; ordinary vanes moved by wind.
3	8–12	7–10	Gentle Breeze	Leaves and small twigs in constant motion; wind extends light flag.
4	13–18	11–16	Moderate Breeze	Raises dust and loose paper; small branches are moved.
5	19–24	17–21	Fresh Breeze	Small trees in leaf begin to sway; crested wavelets form on inland waters.
6	25–31	22–27	Strong Breeze	Large branches in motion; whistling heard in telegraph wires; umbrellas used with difficulty.
7	32–38	28–33	Near Gale	Whole trees in motion; inconvenience felt when walking against the wind.

[10] National Weather Service, "The Beaufort Wind Scale," 2026, https://www.weather.gov/mfl/beaufort.

Force	Speed (mph)	Speed (knots)	Description	Specifications
8	39–46	34–40	Gale	Breaks twigs off trees; generally impedes progress.
9	47–54	41–47	Severe Gale	Slight structural damage occurs (chimney-pots and slates removed).
10	55–63	48–55	Storm	Seldom experienced inland; trees uprooted; considerable structural damage occurs.
11	64–72	56–63	Violent Storm	Very rarely experienced; accompanied by widespread damage.
12	73+	64+	Hurricane	Devastation occurs.

The most significant secondary hazards linked with damaging winds are falling and downed trees, and downed power lines and associated power outages. Power outages usually last anywhere from a few minutes to a few hours. In some extreme cases, power outages have lasted a few days or even a few weeks. Severe-weather-induced power failures can come from the following sources:

- High and moderate winds lead to power outages by blowing objects into power lines and other components, causing them to break.
- Momentary outages may occur if an object, such as a tree limb, is blown onto a power line and then falls off.
- Both high winds (more than 55 mph) and moderate winds (35 to 55 mph) may be sufficient to cause power outages.

If damaging wind coincides with warm temperatures and low humidity, it can pose an increased risk of fire danger. A Red Flag Warning may be issued to warn fire officials, firefighters, and the public of potentially dangerous fire weather conditions.

Previous Occurrences

Previous occurrences of damaging winds in southwestern Utah demonstrate that this hazard is recurrent, geographically widespread, and capable of producing both localized and regionally significant impacts. Across Beaver, Garfield, Iron, Kane, and Washington Counties, damaging wind events have included high winds, strong winds, and dust storm conditions that have disrupted transportation, damaged structures and utilities, caused power outages, and created hazardous travel conditions, particularly along exposed valley corridors, mesas, and desert landscapes. Although these events have not typically resulted in federal or statewide declarations in the region, historical records show that damaging winds have caused measurable property and crop losses, as well as injuries and fatalities, underscoring the importance of continued preparedness, response coordination, and mitigation planning.

FEDERAL DECLARATIONS

A review of FEMA disaster declarations for Beaver, Garfield, Iron, Kane, and Washington Counties from 2000 through 2025 did not identify a declaration with "damaging wind" or "high wind" as the named incident type. This does not establish that wind impacts were absent from other federally declared incidents.

STATE DECLARATIONS

The planning team did not identify a statewide Utah emergency or disaster declaration issued specifically for damaging wind or high wind from 2000 through 2025.

NATIONAL CENTERS FOR ENVIRONMENTAL INFORMATION DATABASE

According to the NOAA National Centers for Environmental Information (NCEI) Storm Events Database query used for this plan, the five-county planning area had 135 days with events categorized as High Wind, Strong Wind, or Dust Storm from 2000 through 2025, with $668,000 in reported property damage, $10,000 in reported crop damage, 1 reported death, and 10 reported injuries. Storm Events losses are reported estimates and may be incomplete; they are not a comprehensive accounting of actual losses. Table 11 provides specific data for damaging winds from 2021 to 2025 at 60 knots and over in the Five County AOG planning area.

Table 11: NCEI Storm Events Database for Damaging Winds 60 Knots or Greater

Date	Event Type	Location	Magnitude (knots)	Fatalities	Injuries	Property Damage	Crop Damage
3/21/2022	High Wind	Southwest Utah (Zone)	60	0	0	$0	$0
3/28/2022	High Wind	Southwest Utah (Zone)	62	0	0	$0	$0
4/11/2022	High Wind	Southwest Utah (Zone)	61	0	0	$0	$0
6/17/2022	High Wind	Southwest Utah (Zone)	63	0	0	$0	$0
11/8/2022	High Wind	Southwest Utah (Zone)	63	0	0	$0	$0
12/2/2022	High Wind	Southwest Utah (Zone)	61	0	0	$0	$0
2/22/2023	High Wind	Southwest Utah (Zone)	63	0	0	$0	$0

Date	Event Type	Location	Magnitude (knots)	Fatalities	Injuries	Property Damage	Crop Damage
2/22/2023	High Wind	Lower Washington County (Zone)	66	0	0	$0	$0
3/1/2024	High Wind	Southwest Utah (Zone)	68	0	0	$0	$0
5/5/2024	High Wind	Southwest Utah (Zone)	62	0	0	$0	$0

Probability of Future Occurrences

Damaging wind is categorized as **Likely** under the Five County AOG probability methodology because wind-related events recur across the planning area and multiple events are documented during most years of the period of record. The NOAA/NCEI Storm Events Database query used for this plan identified 135 event days categorized as High Wind, Strong Wind, or Dust Storm between 2000 and 2025. This historical record supports continued occurrence but does not, by itself, establish an increasing trend in frequency or intensity.[11]

- **Beaver County:** Damaging wind is Likely. Open valleys, transportation corridors, and exposure to frontal and pressure-gradient winds contribute to recurring impacts, including transportation disruption, infrastructure damage, and power outages.
- **Garfield County:** Damaging wind is Likely. Frontal winds and thunderstorm outflows—the intended wind mechanism—can be intensified locally by higher-elevation, plateau, and canyon terrain.
- **Iron County:** Damaging wind is Likely. The county's wind corridors, exposed valleys, transportation routes, and developed areas remain subject to recurring frontal winds, pressure-gradient winds, and thunderstorm outflows. County-specific claims of recurrent 70–80+ mph gusts are not retained because Table 11 does not document Iron County events and no separate supporting source was identified.
- **Kane County:** Damaging wind is Likely. Thunderstorm outflows and regional pressure-gradient winds can affect exposed plateaus, desert basins, mesas, and canyon corridors; arid surfaces can contribute to blowing dust and reduced visibility.
- **Washington County:** Damaging wind is Likely. Recurrent high winds, thunderstorm outflows, and downbursts can affect population centers, infrastructure, and major transportation corridors. The unsupported statement that gusts over 70 mph caused fatalities is not retained; the regional Storm Events record documents one fatality but does not establish that county-specific causal claim in the material reviewed.

[11] NOAA National Centers for Environmental Information, Storm Events Database

Future changes in damaging wind frequency and intensity remain uncertain and vary by wind-producing process. The Fifth National Climate Assessment does not provide a county-scale projection that supports a specific increase in damaging straight-line, thunderstorm-outflow, or pressure-gradient wind frequency in southwestern Utah. The plan therefore assumes continued occurrence at the **Likely** level rather than an increase in hazard probability. Future risk may nevertheless grow as development and infrastructure exposure increase and as wind events interact with extreme heat, drought, wildfire, blowing dust, transportation disruption, and power outages.[12]

Table 12 summarizes qualitative county-level probability and future-conditions findings. "Likely" is the plan-assigned probability category for each county; the regional event record does not establish separate quantitative annual probabilities or a defensible increasing trend for individual counties.

Table 12: Probability and Future Conditions – Damaging Winds and High Winds

County	Probability of Future Events	Primary Wind Types	Typical and Anticipated Intensity	Future Conditions and Location-Specific Risk
Beaver County	Likely. Recurring damaging and high wind events are documented within the regional record.	High winds; frontal winds; localized thunderstorm outflows	Damaging gusts are possible during strong frontal, pressure-gradient, and thunderstorm-outflow events; event intensity varies.	Open valleys and transportation corridors increase exposure. Continued occurrence is expected, but available assessments do not support a county-scale projection of increasing frequency.
Garfield County	Likely. Recurring damaging wind events are documented within the regional record.	Thunderstorm straight-line winds; frontal winds	Damaging gusts are possible, with localized acceleration in canyon, plateau, and higher-elevation terrain; event intensity varies.	Complex terrain creates localized wind-acceleration zones. Continued occurrence is expected, but available assessments do not support a county-scale projection of increasing frequency.
Iron County	Likely. Recurring damaging wind events are documented within the regional record.	High wind events; thunderstorm straight-line winds; downbursts	Damaging gusts are possible during high-wind, straight-line-wind, and downburst events; the reviewed record does not substantiate	Wind corridors, exposed valleys, and developed areas increase exposure. Continued occurrence is expected, but available assessments do not support a county-scale

[12] U.S. Global Change Research Program, Fifth National Climate Assessment, 2023.

County	Probability of Future Events	Primary Wind Types	Typical and Anticipated Intensity	Future Conditions and Location-Specific Risk
			recurrent county-specific gusts of 70–80+ mph.	projection of increasing frequency.
Kane County	Likely. Recurring damaging wind events are documented within the regional record.	Thunderstorm outflow winds; strong winds	Damaging gusts are possible during thunderstorm-outflow and strong-wind events; event intensity varies.	Arid surfaces, exposed routes, and limited visibility during blowing dust increase consequences. Continued occurrence is expected, but available assessments do not support a county-scale projection of increasing frequency.
Washington County	Likely. Recurring damaging wind events are documented within the regional record.	Thunderstorm straight-line winds; downbursts; high wind events	Damaging gusts are possible during straight-line-wind, downburst, and high-wind events; the reviewed material does not substantiate a county-specific claim linking 70+ mph gusts to fatalities.	Population centers, infrastructure, and major travel corridors increase exposure. Continued occurrence is expected, but available assessments do not support a county-scale projection of increasing frequency.

Vulnerability Assessment

Southwestern Utah is vulnerable to damaging winds because population centers, transportation corridors, utility systems, public facilities, agricultural operations, and recreation assets are widely distributed across exposed valleys, desert basins, mesas, canyon systems, and higher-elevation terrain where frontal wind events, pressure-gradient winds, thunderstorm outflows, and localized downbursts can produce damaging conditions. Across Beaver, Garfield, Iron, Kane, and Washington Counties, vulnerability is influenced by the concentration of development in open and wind-exposed settings, reliance on overhead utilities and long transportation links, and the presence of lightweight structures, manufactured housing, tourism infrastructure, and agricultural facilities that are susceptible to roof damage, broken windows, debris impacts, power outages, access disruptions, and hazardous travel conditions. Although the extent of potential losses varies by county, damaging winds have the capacity to affect people, structures, critical facilities, and essential services throughout the region, with the greatest consequences typically occurring where high winds intersect dense development, exposed infrastructure, wildfire-prone landscapes, or major travel corridors.

BEAVER COUNTY

Beaver County is vulnerable to damaging winds because its communities, infrastructure, and economic activity are concentrated in open valleys and along exposed transportation corridors where frontal winds, pressure-gradient winds, and thunderstorm outflows can accelerate. Beaver, Milford, Minersville, and surrounding unincorporated areas contain residences, agricultural buildings, businesses, public facilities, utility lines, and transportation assets susceptible to roof and siding damage, broken windows, fallen trees, debris impacts, and service interruptions.

Vulnerability is heightened along Interstate 15, State Route 21, and local roads, where crosswinds, blowing dust, and debris can reduce visibility, disrupt freight and emergency access, and contribute to crashes. Overhead utilities, older or lightly constructed buildings, manufactured housing, agricultural and ranching facilities, airport assets, and other locations dependent on uninterrupted power and access are among the county's most vulnerable assets.

Damaging winds can damage roofs, manufactured housing, barns, sheds, fences, signs, irrigation equipment, and overhead utilities. Blowing dust, airborne debris, and downed lines can create hazardous travel and road closures, delay emergency response, and interrupt agriculture, businesses, freight movement, and public services, particularly in the Milford area and along State Route 21.

Cascading Impacts: Power and communications outages can disrupt water and wastewater operations, fuel access, traffic control, schools, healthcare, and business continuity. Debris-blocked roads can isolate travelers and delay emergency response and utility repairs, while high winds during hot, dry conditions can increase wildfire potential and compound threats to residents, rangeland, and infrastructure.

Changes in Development: Continued residential, commercial, and infrastructure development in Beaver, Milford, Minersville, along Interstate 15, and near other exposed transportation and utility corridors may increase the number and value of assets subject to damaging winds. New manufactured housing, agricultural facilities, utility extensions, and development at the wildland–urban interface may also increase outage, debris, access, and wildfire-related consequences unless current wind-resistant construction, anchoring, vegetation management, and utility-protection practices are applied.

GARFIELD COUNTY

Garfield County is vulnerable to damaging winds because its communities, transportation corridors, utilities, and visitor-serving facilities are widely dispersed across exposed plateaus, open valleys, canyon systems, and high-elevation terrain where topographic funneling and limited windbreaks can increase wind intensity. In communities such as Panguitch, Escalante, Boulder, Tropic, Hatch, Cannonville, and surrounding unincorporated areas, residences, schools, public buildings, lodging, campgrounds, small businesses, agricultural facilities, and utility infrastructure may be affected by roof and siding damage, broken windows, damaged signs, impacts to outbuildings, and service interruptions during high-wind events.

Garfield County's vulnerability is also shaped by its dependence on long transportation links and destination travel, including U.S. Highway 89, State Route 12, and roads serving Bryce Canyon National Park, Grand Staircase–Escalante National Monument, and Lake Powell access areas, where damaging winds can create hazardous driving conditions, blow debris into roadways, reduce visibility, and interrupt emergency access, tourism activity, and freight movement. Overhead electrical distribution, communications systems, and isolated facilities are especially susceptible to disruption where access is limited and repair times may be extended by distance, weather, or terrain. Agricultural lands, ranch infrastructure, fences, irrigation equipment, recreation sites, and lightweight or older structures in exposed locations are among the most vulnerable assets.

In Garfield County, damaging winds can damage residences, lodging, public buildings, agricultural facilities, signs, outbuildings, and overhead utilities. Windblown debris and reduced visibility can disrupt travel on U.S. Highway 89, State Route 12, and recreation access roads, delaying emergency response and interrupting visitor-serving businesses. Dispersed development and long travel distances can complicate restoration of services.

Cascading Impacts: Power and communications outages can interrupt utility-dependent public services and business operations. Road debris and access restrictions can delay utility repairs and emergency response to isolated facilities and recreation areas. When winds coincide with hot, dry conditions, increased wildfire potential can compound these disruptions.

Changes in Development: Future development is expected to remain concentrated in and around established communities and visitor-serving corridors, while recreation-related facilities and dispersed rural development may expand in exposed plateau, valley, and canyon settings. Additional housing, lodging, utility extensions, and transportation improvements may increase exposed assets and service dependencies, particularly where long access routes and limited redundancy can prolong outages or repairs.

IRON COUNTY

Iron County's dispersed residences, manufactured homes, agricultural buildings, public facilities, communications sites, utilities, and transportation corridors are vulnerable to damaging winds. Cedar City concentrates homes, businesses, schools, Southern Utah University, healthcare and public safety facilities, airport and industrial assets, and utilities. Enoch's neighborhoods, schools, municipal facilities, construction sites, and developing areas are also exposed. In Brian Head, lodging, resort facilities, ski-area infrastructure, utilities, forested slopes, and the limited State Route 143 access corridor are susceptible to high winds. Kanarraville, Paragonah, and Parowan contain exposed homes, agricultural assets, utilities, and community facilities.

Damaging winds could damage roofs, outbuildings, signs, trees, vehicles, agricultural equipment, and power and communications infrastructure. Debris and downed lines could block county roads, state highways, Interstate 15 access routes, and State Route 143, disrupting emergency response, education, healthcare, business activity, agricultural operations, airport operations, and visitor travel.

Cascading Impacts: Utility outages and blocked transportation routes can extend wind impacts beyond directly damaged buildings. Disruption of power, communications, and access can interrupt public services and delay restoration, while downed trees or lines along the limited Brian Head access corridor can restrict movement of residents, visitors, responders, and utility crews.

Changes in Development: Continued growth in Cedar City, Enoch, and other communities, together with new residential subdivisions, commercial and industrial development, campus and airport-area investment, and expansion of recreation and resort facilities, may increase exposure to wind damage and utility interruption. Development along Interstate 15, State Route 143, and other constrained or exposed corridors may also increase the consequences of debris, crosswinds, blocked access, and service outages unless new construction and infrastructure incorporate appropriate wind-resistant design and redundancy.

KANE COUNTY

Kane County's exposed desert basins, mesas, canyon systems, and open plateaus contain dispersed housing, utilities, recreation sites, agricultural and ranching assets, and visitor-serving facilities vulnerable to thunderstorm outflows, pressure-gradient winds, blowing dust, and debris. Long utility lines and limited alternate routes increase sensitivity to service interruptions. Kanab concentrates residents, businesses, schools, public buildings, and community services, while Alton, Big Water, Glendale, Orderville, and unincorporated areas contain exposed homes, local roads, utilities, and agricultural or recreation-related assets.

Damaging winds could damage roofs, manufactured housing, sheds, barns, fences, signs, utility lines, and recreation facilities. Crosswinds, blowing dust and sand, debris, and downed lines could create hazardous travel, road closures, power and communications outages, and delays in emergency response. These disruptions could interrupt tourism, recreation, agriculture, businesses, and access to remote areas.

Cascading Impacts: Power and communications interruptions can disrupt fuel access, visitor services, and community operations. Debris-blocked roads and limited alternate routes can delay emergency response and service restoration, extending consequences for dispersed residents, travelers, and recreation users.

Changes in Development: Growth in Kanab and other communities, expansion of visitor-serving and recreation facilities, and dispersed residential development may increase the number of people and structures exposed to damaging winds, blowing dust, and service interruption. New utility extensions and development along highways or remote access routes may further increase dependence on long, exposed infrastructure systems and limited alternate routes unless wind-resistant construction, anchoring, and infrastructure redundancy are incorporated.

WASHINGTON COUNTY

Washington County's neighborhoods, roads, bridges, overhead utilities, public safety facilities, schools, parks, agricultural lands, and recreation assets are vulnerable in exposed valleys, desert basins, canyon

mouths, and travel corridors. St. George's concentrated residential and commercial development, medical facilities, airport-related infrastructure, and regional services increase potential consequences. Washington City and Hurricane contain growing development and exposed infrastructure, while smaller communities and Zion gateway communities contain homes, visitor-serving facilities, utilities, and constrained access routes susceptible to wind damage and debris.

Damaging winds can down trees and power lines, damage roofs and outbuildings, disrupt utilities and communications, and create hazardous travel on Interstate 15 and regional roads. Potentially affected facilities include St. George Regional Hospital, the St. George 911 Communications Center, schools, public safety and government buildings, St. George Regional Airport, and water and wastewater systems. Impacts can include emergency response and service-delivery interruptions, business and agricultural losses, recreation access restrictions, and debris removal and repair costs.

Cascading Impacts: Power outages and transportation disruptions can affect healthcare access, emergency communications, schools, businesses, and other regional services. In constrained gateway corridors, debris and utility damage can interrupt visitor access and local commerce. Strong winds during hot, dry conditions can increase wildfire potential and compound service and access disruptions.

Changes in Development: Rapid residential, commercial, institutional, and infrastructure growth in St. George, Washington City, Hurricane, and surrounding communities is increasing the number and value of assets exposed to damaging winds. Continued development along Interstate 15, near canyon mouths, in desert basins, and within visitor gateway corridors may increase demands on utilities, transportation systems, emergency services, and debris management. Applying current wind-resistant construction, anchoring, utility-protection, and access-planning practices can help limit growth in future vulnerability.

Drought

Drought is a slow-onset hazard caused by an extended period of below-normal precipitation or other moisture deficits that reduce water availability. Drought can affect precipitation, soil moisture, snowpack, streamflow, reservoir storage, groundwater, vegetation, agriculture, and water-dependent communities and economies. Meteorological, agricultural, hydrologic, and socioeconomic effects may emerge at different times and recover at different rates.

Meteorological drought refers primarily to precipitation deficits relative to local climate. Agricultural drought occurs when soil moisture and available water are insufficient for crops, rangelands, or livestock. Hydrologic drought reflects reduced streamflow, snowpack, reservoir storage, spring discharge, or groundwater levels and may persist after precipitation returns closer to normal. Socioeconomic drought occurs when water shortage affects the supply of goods, services, or activities that depend on water.

Utah's water supply depends substantially on winter mountain precipitation, snowpack accumulation, spring runoff, reservoir storage, and groundwater. Reduced snowpack, altered runoff timing, low reservoir carryover, and groundwater decline can therefore contribute to prolonged hydrologic effects.

Location

Drought can occur throughout Utah and must be evaluated relative to local climate and water-supply conditions. In the five-county planning area, drought is a regional hazard rather than one confined to a single community or watershed. Severity and impacts vary by elevation, precipitation pattern, snowpack, soil moisture, streamflow, reservoir and groundwater conditions, water-source redundancy, and seasonal demand.

Southwestern Utah's arid baseline climate, precipitation variability, population and development patterns, irrigated agriculture, tourism, recreation, and dependence on surface-water and groundwater systems shape drought exposure. Prolonged precipitation deficits and high evaporative demand can reduce soil moisture, forage, streamflow, spring discharge, reservoir inflow, and groundwater recharge while increasing demand during warm periods. Drought may also compound wildfire, smoke, dust, ecosystem, and water-quality stresses.

BEAVER COUNTY

Beaver County is broadly exposed to drought across valley and upland areas. Potential effects are concentrated in irrigated agricultural areas, rangelands, livestock operations, municipal and domestic water systems, groundwater-dependent uses, watersheds, and communities with limited supply redundancy. Weekly U.S. Drought Monitor conditions provide dated snapshots of location and intensity; they are not treated as permanent population or asset counts in this profile.

Figure 6 presents a long-term precipitation-based drought indicator for Beaver County. It illustrates substantial variation between wet and dry periods but does not, by itself, measure reservoir storage, groundwater, water demand, agricultural loss, or community impact.

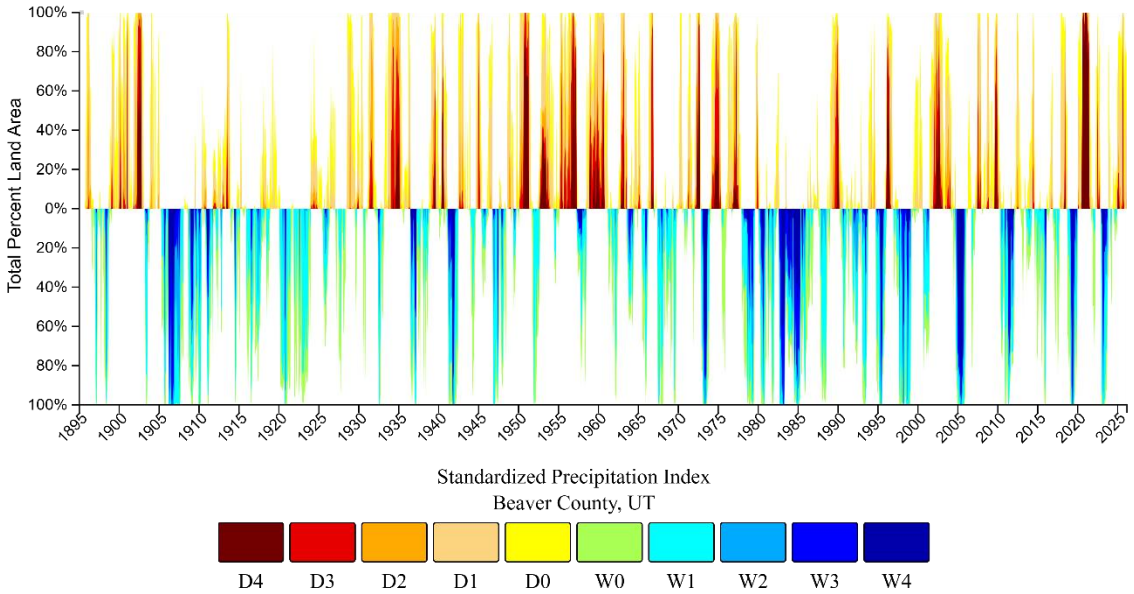


Figure 6: Standardized Precipitation Index for Beaver County, 1895–2025

GARFIELD COUNTY

Garfield County is broadly exposed to drought across high-elevation watersheds, valleys, communities, rangelands, and agricultural areas. Reduced snowpack and runoff can affect streamflow, springs, soil moisture, irrigation supply, grazing conditions, recreation resources, and small water systems. The 2022 Census of Agriculture identifies 297 farms, 85,397 acres in farms, and 15,721 irrigated acres, illustrating the county's agricultural exposure to water shortage.

Hydrologic effects may lag meteorological drought because snowpack, reservoirs, streams, springs, and groundwater respond and recover at different rates. Drought impacts in Garfield County should therefore be evaluated using multiple indicators and alongside local water-supply and land-management information.

IRON COUNTY

Iron County is broadly exposed to drought across developed valleys, agricultural areas, rangelands, upland watersheds, and groundwater-dependent systems. Water-supply reliability depends on the performance and management of stored surface water, groundwater, springs, and delivery infrastructure. The 2022 Census of Agriculture identifies 542 farms, 475,348 acres in farms, and 64,987 irrigated acres, indicating substantial agricultural exposure to prolonged shortage.

KANE COUNTY

Kane County is broadly exposed to drought across upland watersheds, rangelands, communities, and recreation landscapes. Reduced winter precipitation and snowpack can contribute to lower runoff, diminished soil moisture, stressed vegetation, and reduced reliability of surface-water, spring, and groundwater supplies. Weekly drought-monitoring products show intensity at a point in time and should not be interpreted as fixed population exposure.

Figure 7 presents a long-term precipitation-based drought indicator for Kane County. It provides historical context but does not independently measure water supply, agricultural losses, or community consequences.

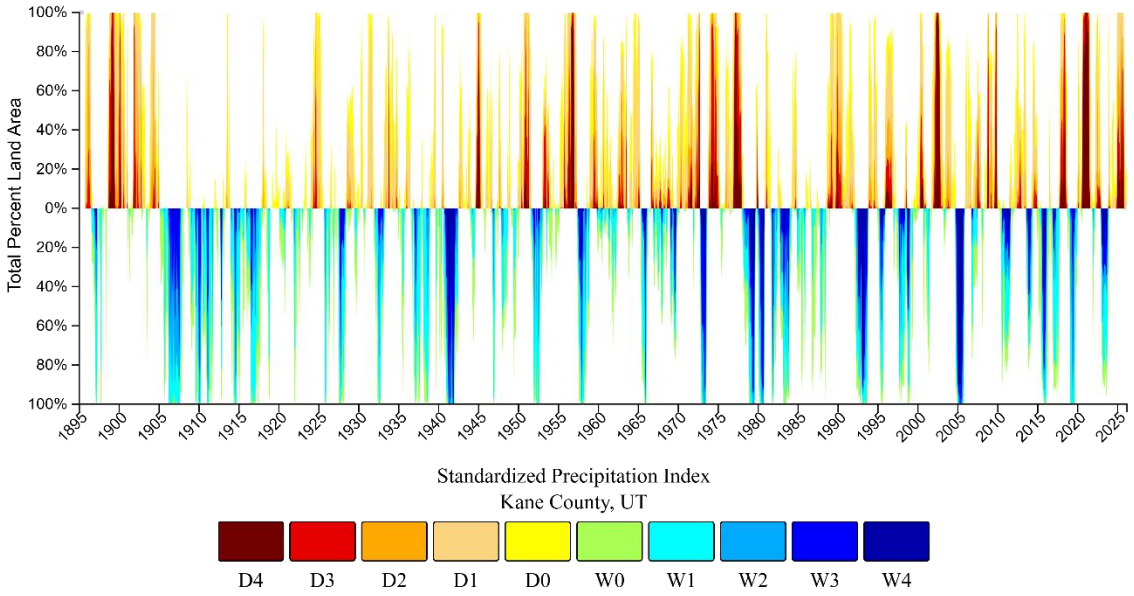


Figure 7: Standardized Precipitation Index for Kane County, 1895–2025

The 2022 Census of Agriculture identifies 189 farms, 125,662 acres in farms, and 6,436 irrigated acres in Kane County. These data indicate exposure of agricultural and grazing systems to reduced forage, stock-water limitations, and irrigation shortages. Drought may also affect visitor-serving communities, recreation access, wildfire conditions, and natural resources.

WASHINGTON COUNTY

Washington County is broadly exposed to drought across the Virgin River Basin, developed communities, agricultural areas, recreation resources, and desert ecosystems. The Washington County Water Conservancy District's regional conservation planning identifies the area's aridity, dependence on basin water supplies, seasonal irrigation demand, and population growth as important water-management considerations. Drought risk reflects both reduced supply and elevated demand.

Reduced snowpack and runoff, high evapotranspiration, low reservoir carryover, groundwater stress, and sustained warm-season demand can affect municipal water reliability, landscaping, agriculture, recreation, ecosystems, and fire-suppression capability. Conservation, reuse, storage, source diversification, and demand management can reduce vulnerability but do not eliminate exposure to prolonged regional drought.

Magnitude and Extent

Drought extent is characterized with the U.S. Drought Monitor categories D0 through D4 and, where available, supporting precipitation, snowpack, soil-moisture, streamflow, reservoir, and groundwater indicators. D0 represents abnormal dryness and is not a drought category; D1 through D4 represent Moderate, Severe, Extreme, and Exceptional Drought. Because impacts vary by sector and water system, the U.S. Drought Monitor is used for consistent regional characterization rather than as a stand-alone estimate of physical or economic loss.

D1 conditions can signal emerging moisture deficits and stress to vegetation or water supplies. D2 conditions indicate more persistent deficits and increasing agricultural or water-supply impacts. D3 conditions are associated with major, widespread impacts, and D4 represents exceptional and extensive drought impacts. These categories communicate relative intensity; local consequences depend on season, duration, antecedent conditions, water storage, groundwater, demand, and management capacity.

Previous Occurrences

Utah has experienced recurrent drought over the instrumental record, including prolonged episodes in the twentieth and early twenty-first centuries. The 2024 Utah Enhanced State Hazard Mitigation Plan identifies 1999 to 2006 as a long modern statewide drought and describes severe statewide impacts during the early 2000s. These events demonstrate that drought may persist across multiple seasons and affect the entire planning area even when local intensity varies.

FEDERAL DECLARATIONS

A review of FEMA disaster declarations did not identify a major disaster declaration issued specifically for drought in the five-county planning area. This does not mean drought impacts were absent or ineligible for other federal or state assistance, because agricultural disaster designations and drought-response authorities use different programs and criteria.

U.S. Department of Agriculture (USDA) agricultural disaster designations have included one or more of the five counties during recent drought periods.

STATE DECLARATIONS

Utah governors have issued drought-related executive orders during recent statewide drought periods. These orders document state response and coordination but are not used as a complete occurrence inventory or as the sole basis for the regional probability rating.

Table 13: Utah Drought Executive Orders Affecting the Planning Area

Year	State Executive Order Number	Title and Description
2026	2026-02	Severe Drought in 29 Counties, 22 Counties in Extreme Drought
2025	2025-04	Washington, Iron, Beaver, Garfield, Kane Counties in Extreme or Severe Drought
2022	2022-04	All 29 counties under severe drought
2021	2021-07	Statewide extreme drought
2021	2021-13	Statewide extreme drought

Probability of Future Occurrences

Drought is a recurring regional hazard. Its likelihood is evaluated using the plan-wide probability categories, historical drought records, repeated U.S. Drought Monitor coverage, state drought response, and agricultural disaster designations. A single week's drought footprint is not used to estimate annual probability or permanent population exposure.

Future conditions may increase drought severity and water-supply stress even where long-term precipitation projections remain uncertain. The Fifth National Climate Assessment identifies warming, reduced western snowpack, greater evaporative demand, and declining summer soil moisture as relevant western and southwestern risks. In the planning area, these influences may affect runoff timing, reservoir and groundwater recovery, agricultural demand, ecosystem stress, wildfire conditions, and peak municipal demand. The effect on any particular water system depends on source, storage, redundancy, conservation, infrastructure, and operating rules.

The probability rating for future occurrences is **Highly Likely**. Drought conditions occur repeatedly within the planning area and may develop in any year. This rating describes regional occurrence under the Five County AOG methodology and does not imply that every county or water system will experience the same intensity or consequences in a given year.

The probability rating is supported by the long historical record, repeated U.S. Drought Monitor observations, state drought actions, and USDA agricultural designations.

Vulnerability Assessment

Drought vulnerability in the five-county planning area is determined by the interaction of water shortage with exposed people, water systems, agriculture, critical facilities, infrastructure, economies, and natural resources. Buildings are generally affected indirectly through water-use restrictions, subsidence where groundwater decline occurs, reduced fire-flow capability, landscape loss, or interruption of water-dependent operations. More sensitive systems include small or single-source water systems, power-dependent wells and pumps, irrigation delivery systems, livestock watering facilities, fire-protection water supplies, healthcare and congregate-care facilities, and communities with limited financial or technical capacity.

BEAVER COUNTY

Beaver County's principal drought vulnerabilities include irrigated agriculture, livestock and grazing operations, municipal and domestic water supplies, groundwater-dependent users, irrigation delivery, fire-protection water, and drought-stressed rangelands and watersheds. The 2022 Census of Agriculture identifies 267 farms, 119,496 acres in farms, and 26,787 irrigated acres. Drought can reduce yields and forage, increase feed and pumping costs, constrain stock water, stress small water systems, and increase wildfire and dust impacts. County-specific actions and capabilities should be read with the Beaver County and participating-jurisdiction annexes.

- **Hay and Corn Production Acreage:** An estimated 31,858 acres of hay and 2,140 acres of corn were within drought-affected areas.
- **Livestock Inventory:** An estimated 14,735 cattle and 638 sheep were within drought-affected areas, indicating exposure to forage loss and stock-water limitations.[13]
- **County Agricultural Land Base:** USDA 2022 Census of Agriculture data indicate 267 farms and approximately 119,496 acres in farms in Beaver County, including about 26,787 irrigated acres that may be especially sensitive to prolonged water shortage.[14]
- **Water-Dependent Infrastructure and Systems:** Municipal and domestic water systems, irrigation delivery systems, livestock watering infrastructure, and groundwater-dependent supplies are vulnerable even where direct structural damage is limited.
- **Natural Resource Assets:** Rangelands, watersheds, stream corridors, habitat areas, and drought-stressed vegetation are vulnerable to productivity loss, ecological stress, and elevated wildfire conditions.

Beaver County agricultural impacts arise because crop production, pasture, hay, and livestock operations depend on reliable seasonal water supplies, soil moisture, and forage conditions. County conditions reported by Drought.gov estimate that 31,858 acres of hay, 2,140 acres of corn, 14,735 cattle, and 638

[13] Drought.gov, "Drought Conditions for Beaver County," 2026, https://www.drought.gov/states/utah/county/beaver.
[14] United States Department of Agriculture, "2022 Census of Agriculture County Profile, Beaver County, Utah," 2022, https://www.nass.usda.gov/Publications/AgCensus/2022/Online_Resources/County_Profiles/Utah/cp49001.pdf.

sheep were located in drought-affected areas in Beaver County as of May 2026.[15] These figures demonstrate that drought can affect a substantial share of the county's agricultural base at the same time, increasing the likelihood of reduced yields, poorer forage quality, increased feed costs, stock-water stress, and economic losses for producers. Rural households and communities are also vulnerable where water systems rely on limited surface water, springs, or groundwater sources that may decline during prolonged dry periods.

Water shortages can interrupt drinking water supply, irrigation delivery, livestock watering, dust control, and fire suppression even where buildings remain physically intact.

Cascading Impacts: Reduced soil moisture and streamflow can stress vegetation, lower rangeland productivity, degrade habitat conditions, and increase susceptibility to erosion and invasive species establishment. Drought can also elevate wildfire potential by drying fuels and extending the period during which ignition and fire spread are more likely. Reduced water availability may constrain fire protection, interrupt agricultural and water-dependent operations, increase pumping and operating costs, and place added pressure on transportation and emergency access where wildfire or dust conditions worsen. At the county scale, these impacts are magnified by Utah's dry baseline climate and dependence on winter snowpack and spring runoff, which the 2024 Utah Enhanced State Hazard Mitigation Plan identifies as key controls on hydrologic drought and lagged recovery.

Changes in Development: Future vulnerability may increase where new homes, businesses, agricultural uses, or infrastructure add demand to limited municipal, domestic, groundwater, or irrigation supplies. Conversely, conservation, water-system improvements, source redundancy, protective development standards, and land-use decisions that account for available supply may reduce vulnerability. Where the location or scale of future development is uncertain, drought exposure should be reassessed as growth and water-management projects proceed.

GARFIELD COUNTY

Garfield County's principal drought vulnerabilities include ranching and grazing, irrigated agriculture, small community and domestic water supplies, springs and groundwater-dependent systems, visitor-serving communities, recreation resources, rangelands, and upland watersheds. The 2022 Census of Agriculture identifies 297 farms, 85,397 acres in farms, and 15,721 irrigated acres. Limited alternate supplies and long distances can increase operational consequences where drought affects water availability, wildfire conditions, or access to recreation resources.

- **Hay and Haylage Production Acreage:** An estimated 12,611 acres of hay and 237 acres of haylage were within drought-affected areas.[16]

[15] Drought.gov, "Drought Conditions for Beaver County," 2026, https://www.drought.gov/states/utah/county/beaver.
[16] Drought.gov, "Drought Conditions for Garfield County," 2026, https://www.drought.gov/states/utah/county/garfield.

- **Livestock Inventory:** An estimated 10,229 cattle and 652 sheep were within drought-affected areas, indicating exposure to forage loss and stock-water limitations.[17]
- **County Agricultural Land Base:** Approximately 297 farms and 85,397 acres in farms, including about 15,721 irrigated acres, may be sensitive to prolonged water shortage.[18]
- **Water-Dependent Infrastructure and Systems:** Municipal and domestic water systems, irrigation delivery systems, livestock watering infrastructure, springs, and groundwater-dependent supplies are vulnerable even where direct structural damage is limited.
- **Natural Resource and Recreation Assets:** Rangelands, watersheds, stream corridors, habitat areas, drought-stressed vegetation, and tourism-dependent landscapes are vulnerable to productivity loss, ecological stress, and elevated wildfire conditions.

Garfield County ranching, grazing, and irrigated agriculture are affected because livestock operations, hay production, and irrigated lands depend on reliable seasonal water supplies, soil moisture, and forage conditions. County conditions reported by Drought.gov estimate that 12,611 acres of hay, 237 acres of haylage, 10,229 cattle, and 652 sheep were located in drought-affected areas in Garfield County in May 2026.[19] These figures demonstrate that drought can affect a substantial share of the county's agricultural base at the same time, increasing the likelihood of reduced yields, poorer forage quality, increased feed costs, stock-water stress, and economic losses for producers. Rural households, small communities, and visitor-oriented areas are also vulnerable where water systems rely on limited surface water, springs, or groundwater sources that may decline during prolonged dry periods.

In Garfield County, reduced water availability can limit drinking water supply, irrigation delivery, livestock watering, dust control, landscaping, and fire suppression without directly damaging buildings.

Cascading Impacts: Reduced soil moisture and streamflow can stress vegetation, lower rangeland productivity, degrade habitat conditions, and increase susceptibility to erosion and invasive species establishment. Drought can also elevate wildfire potential by drying fuels and extending the period during which ignition and fire spread are more likely. Water shortages may interrupt agricultural and visitor-serving operations, constrain fire-protection supplies, affect recreation access, and increase economic pressure on producers and communities. These impacts are magnified by Garfield County's dependence on seasonal runoff, limited local water supplies in some areas, and the importance of scenic and recreation-based landscapes to the county economy.

Changes in Development: Growth or redevelopment in communities and visitor-serving areas may increase seasonal water demand and reliance on small or limited-source systems. Expansion of transportation, recreation, utility, or water infrastructure may either increase exposure or improve reliability, depending on design and available supply. Conservation, source redundancy, infrastructure

[17] Drought.gov, "Drought Conditions for Garfield County," 2026, https://www.drought.gov/states/utah/county/garfield.
[18] U.S. Department of Agriculture, "2022 Census of Agriculture County Profile, Garfield County, Utah," 2022, https://www.nass.usda.gov/Publications/AgCensus/2022/Online_Resources/County_Profiles/Utah/cp49017.pdf.
[19] Drought.gov, "Drought Conditions for Garfield County," 2026, https://www.drought.gov/states/utah/county/garfield.

upgrades, and development standards aligned with demonstrated water availability may reduce future vulnerability.

IRON COUNTY

Iron County's principal drought vulnerabilities include irrigated agriculture, livestock operations, groundwater-dependent municipal and domestic supplies, pumping and conveyance infrastructure, growing developed areas, rangelands, and watersheds. The 2022 Census of Agriculture identifies 542 farms, 475,348 acres in farms, and 64,987 irrigated acres. Prolonged drought can increase competition among uses, pumping and treatment costs, agricultural losses, ecosystem stress, and wildfire risk. Growth and new development can increase demand, while recharge, conservation, reuse, storage, and infrastructure projects may reduce vulnerability where implemented.

- **Population and Households Dependent on Reliable Water Supply:** Approximately 46,163 residents were located in drought-affected areas as of May 2026.[20]
- **Hay, Haylage, and Corn Production Acreage:** An estimated 58,661 acres of hay, 3,171 acres of haylage, and 1,506 acres of corn were within drought-affected areas.[21]
- **Livestock Inventory:** An estimated 42,525 sheep and 23,165 cattle were within drought-affected areas, indicating exposure to forage loss and stock-water limitations.[22]
- **County Agricultural Land Base:** Approximately 542 farms and 475,348 acres in farms, including about 64,987 irrigated acres, may be sensitive to prolonged water shortage.[23]
- **Water-Dependent Infrastructure and Systems:** Municipal and domestic water systems, irrigation delivery systems, livestock watering infrastructure, groundwater-dependent supplies, and small community water systems are vulnerable even where direct structural damage is limited.
- **Natural Resource Assets:** Rangelands, watersheds, stream corridors, habitat areas, and drought-stressed vegetation are vulnerable to productivity loss, ecological stress, and elevated wildfire conditions.

Iron County agricultural impacts reflect the dependence of production on water: hay, haylage, corn, pasture, and livestock operations depend on reliable seasonal water supplies, soil moisture, and forage conditions. County conditions reported by Drought.gov estimate that 58,661 acres of hay, 3,171 acres of haylage, 1,506 acres of corn, 42,525 sheep, and 23,165 cattle were located in drought-affected areas in Iron County in May 2026.[24] These figures demonstrate that drought can affect a substantial share of the county's agricultural base at the same time, increasing the likelihood of reduced yields, reduced forage quality, increased feed costs, stock-water stress, and economic losses for producers. Residents, rural

[20] Drought.gov, "Drought Conditions for Iron County," 2026, https://www.drought.gov/states/utah/county/iron.
[21] Drought.gov, "Drought Conditions for Iron County," 2026, https://www.drought.gov/states/utah/county/iron.
[22] Drought.gov, "Drought Conditions for Iron County," 2026, https://www.drought.gov/states/utah/county/iron.
[23] United States Department of Agriculture, "2022 Census of Agriculture County Profile, Iron County, Utah," 2022, https://www.nass.usda.gov/Publications/AgCensus/2022/Online_Resources/County_Profiles/Utah/cp49021.pdf.
[24] Drought.gov, "Drought Conditions for Iron County," 2026, https://www.drought.gov/states/utah/county/iron.

households, and communities are also vulnerable where water systems rely on limited surface water, springs, or groundwater sources that may decline during prolonged dry periods.

Iron County infrastructure can remain physically intact while shortages reduce the reliability of drinking water, irrigation, livestock watering, landscaping, dust control, and fire suppression.

Cascading Impacts: Reduced soil moisture and streamflow can stress vegetation, lower rangeland productivity, degrade habitat conditions, and increase susceptibility to erosion and invasive species establishment. Drought can also elevate wildfire potential by drying fuels and extending the period during which ignition and fire spread are more likely. Declining supplies may increase pumping demands and utility costs, constrain fire protection and water-dependent operations, and compound transportation or emergency-access limitations during wildfire and dust events. These impacts are magnified by Iron County's dependence on snowpack-driven runoff, groundwater supplies, and a large agricultural land base that is sensitive to prolonged water shortages.

Changes in Development: Continued growth and infrastructure expansion in developed valleys may increase municipal, domestic, and landscaping demand and place additional pressure on groundwater-dependent systems. Agricultural conversion or changes in irrigation practice may alter where and when water demand occurs. Recharge, conservation, reuse, storage, conveyance improvements, source diversification, and water-sensitive development standards may reduce vulnerability where they are implemented and maintained.

KANE COUNTY

Kane County's principal drought vulnerabilities include ranching and grazing, limited irrigated agriculture, springs and small water systems, groundwater-dependent users, visitor-serving communities, recreation resources, rangelands, and watersheds. The 2022 Census of Agriculture identifies 189 farms, 125,662 acres in farms, and 6,436 irrigated acres. Drought can reduce forage and stock water, increase operating costs, constrain small supplies, stress recreation landscapes, and compound wildfire, dust, and public-health concerns.

- **Population and Households Dependent on Reliable Water Supply:** Approximately 7,125 residents were located in drought-affected areas as of late April 2026, reflecting the county-specific Drought.gov reporting date.
- **Hay Production Acreage:** An estimated 3,331 acres of hay were within drought-affected areas.[25]
- **Livestock Inventory:** An estimated 5,675 cattle and 353 sheep were within drought-affected areas, indicating exposure to forage loss and stock-water limitations.[26]

[25] Drought.gov, "Drought Conditions for Kane County," 2026, https://www.drought.gov/states/utah/county/kane.
[26] Drought.gov, "Drought Conditions for Kane County," 2026, https://www.drought.gov/states/utah/county/kane.

- **County Agricultural Land Base:** Approximately 189 farms and 125,662 acres in farms, including about 6,436 irrigated acres, may be sensitive to prolonged water shortage.[27]
- **Water-Dependent Infrastructure and Systems:** Municipal and domestic water systems, springs, small community water systems, irrigation delivery infrastructure, and groundwater-dependent supplies are vulnerable even where direct structural damage is limited.
- **Natural Resource and Tourism-Dependent Assets:** Rangelands, watersheds, stream corridors, habitat areas, drought-stressed vegetation, park gateway communities, and recreation-oriented landscapes are vulnerable to ecological stress, reduced water availability, and elevated wildfire conditions.

In Kane County, ranching, grazing, and limited irrigated agriculture are affected because livestock operations, hay production, and irrigated lands depend on reliable seasonal water supplies, soil moisture, and forage conditions. County conditions reported by Drought.gov estimate that 3,331 acres of hay, 5,675 cattle, and 353 sheep were located in drought-affected areas in Kane County in late April 2026.[28] These figures demonstrate that drought can affect a meaningful share of the county's agricultural base at the same time, increasing the likelihood of reduced forage quality, higher feed costs, stock-water stress, and economic losses for producers. Residents, rural households, and gateway communities are also vulnerable where water systems rely on limited surface water, springs, or groundwater sources that may decline during prolonged dry periods.

Kane County water-dependent services may be disrupted as supplies for drinking water, irrigation, livestock watering, dust control, landscaping, and fire suppression decline. Natural resources are similarly vulnerable. Reduced soil moisture and streamflow can stress vegetation, lower rangeland productivity, degrade habitat conditions, and increase susceptibility to erosion and invasive species establishment. Drought also elevates wildfire potential by drying fuels and extending the period during which ignition and fire spread are more likely. These impacts are magnified by Kane County's dependence on variable snowpack and seasonal runoff, limited local water supplies in some communities, and the importance of recreation and tourism to the county economy.

Cascading Impacts: In Kane County, water shortage can set off interconnected environmental, economic, and operational impacts. Prolonged dry conditions can increase wildfire likelihood and severity, reduce air quality through smoke and windblown dust, affect wildlife and habitat conditions, disrupt recreation access and visitor-serving activity, and place additional pressure on emergency response and public health systems. Economic effects can compound as ranchers and producers absorb higher operating costs, utilities and small systems manage tighter supplies, and communities face increased conservation and drought-response demands. Transportation and emergency access may also be constrained when wildfire, smoke, or dust affects travel conditions.

[27] United States Department of Agriculture, "2022 Census of Agriculture County Profile, Kane County, Utah," 2022, https://www.nass.usda.gov/Publications/AgCensus/2022/Online_Resources/County_Profiles/Utah/cp49025.pdf.
[28] Drought.gov, "Drought Conditions for Kane County," 2026, https://www.drought.gov/states/utah/county/kane.

Changes in Development: Growth or redevelopment in gateway communities and visitor-serving areas may increase seasonal demand on springs, groundwater, and small community water systems. Expansion of recreation, transportation, utility, or water infrastructure may increase exposure if it relies on constrained supplies, but may reduce vulnerability when it improves redundancy, storage, efficiency, or emergency access. Land-use and development decisions that account for demonstrated water availability and wildfire-related access needs may limit future vulnerability.

WASHINGTON COUNTY

Washington County's principal drought vulnerabilities include municipal and domestic water demand, Virgin River Basin supplies, storage and conveyance systems, irrigation and landscaping demand, agriculture, recreation and tourism, fire-protection water, and desert and riparian ecosystems. The 2022 Census of Agriculture identifies 553 farms, 105,541 acres in farms, and 11,366 irrigated acres. Continued growth can increase exposure and demand; conservation, reuse, storage, source diversification, and updated development standards can reduce vulnerability. The Washington County Water Conservancy District conservation plan provides additional locally specific context.

- **Crop and Livestock Exposure:** An estimated 8,288 acres of hay, 220 acres of haylage, 8,583 cattle, and 766 sheep were within drought-affected areas, indicating exposure to reduced forage, higher feed costs, and stock-water limitations.
- **County Agricultural Land Base:** Approximately 553 farms and 105,541 acres in farms, including about 11,366 irrigated acres, may be sensitive to prolonged water shortage.[29]
- **Water-Dependent Infrastructure and Systems:** Municipal and domestic water systems, irrigation delivery systems, groundwater-dependent supplies, regional water infrastructure, and landscaping irrigation systems are vulnerable even where direct structural damage is limited.
- **Natural Resource and Tourism-Dependent Assets:** Rangelands, watersheds, stream corridors, habitat areas, parks, outdoor recreation areas, and drought-stressed vegetation are vulnerable to reduced water availability, ecological stress, and elevated wildfire conditions.

Washington County municipal water supply and demand management are affected because the county is highly arid, population growth continues to increase demand, and irrigation and landscaping uses place additional pressure on limited supplies during hot, dry periods. Agriculture remains vulnerable as well. County conditions reported by Drought.gov estimate that 8,288 acres of hay, 220 acres of haylage, 8,583 cattle, and 766 sheep were located in drought-affected areas in Washington County in May 2026.[30] These figures demonstrate that drought can affect a meaningful share of the county's agricultural base at the same time, increasing the likelihood of reduced forage quality, higher feed costs, stock-water stress, and economic losses for producers. Residents, businesses, visitor-serving areas, and communities are also

[29] United States Department of Agriculture, "2022 Census of Agriculture County Profile, Washington County, Utah," 2022, https://www.nass.usda.gov/Publications/AgCensus/2022/Online_Resources/County_Profiles/Utah/cp49053.pdf.
[30] Drought.gov, "Drought Conditions for Washington County," 2026, https://www.drought.gov/states/utah/county/washington.

vulnerable where water systems rely on limited supplies from the Virgin River Basin and associated storage and conveyance systems.

In Washington County, shortages can constrain drinking water, irrigation, landscaping, dust control, cooling, and fire suppression even without direct building damage. Natural resources are similarly vulnerable. Reduced soil moisture and streamflow can stress vegetation, degrade habitat conditions, and increase susceptibility to erosion and invasive species establishment. Drought also elevates wildfire potential by drying fuels and extending the period during which ignition and fire spread are more likely. These impacts are magnified by Washington County's arid baseline climate, dependence on limited basin supplies, and strong seasonal demand pressures.

Cascading Impacts: Washington County can experience secondary environmental, economic, and operational consequences as drought persists. Prolonged dry conditions can increase wildfire likelihood and severity, reduce air quality through smoke and windblown dust, affect outdoor recreation and tourism conditions, constrain fire-protection water, and place additional pressure on emergency response and public health systems. Economic effects can compound as utilities and water providers face increased conservation and operating demands, producers absorb higher costs, businesses experience interruption, and communities confront tighter water-management decisions during peak season. Wildfire, smoke, or dust may also disrupt transportation and emergency access.

Changes in Development: Continued population growth, redevelopment, and expansion of housing, businesses, recreation facilities, and supporting infrastructure may increase municipal, landscaping, cooling, and seasonal water demand. Additional storage, reuse, conservation, source diversification, conveyance improvements, and updated development standards may reduce future vulnerability where they produce reliable capacity and demand reductions. Land-use patterns and project approvals that account for available water supply, fire-flow needs, and long-term system reliability may further limit exposure.

Earthquake

An earthquake is the sudden release of energy in Earth's crust when rocks rupture and slip along a fault. Seismic waves generated by this movement can cause ground shaking, surface fault rupture, liquefaction, lateral spreading, landslides, rockfall, and other ground failure. Consequences may include deaths and injuries; structural and nonstructural building damage; hazardous-material releases; and disruption of transportation, water, wastewater, electric power, natural gas, fuel, and communications systems.

The Five County AOG planning area lies within the Intermountain Seismic Belt, a broad zone of earthquake activity associated in part with crustal extension in the Basin and Range Province. Although Utah is not on a tectonic plate boundary, active faults and distributed seismicity can generate damaging earthquakes. Earthquake sources include mapped faults capable of surface rupture and earthquakes that do not rupture the ground surface.

Southwestern Utah's earthquake hazard is influenced by active fault systems, including the Hurricane, Washington, and Sevier–Toroweap fault zones. Ground-shaking severity depends on magnitude, distance, rupture characteristics, wave-propagation effects, and local site conditions. Susceptible soils may amplify shaking or experience liquefaction and lateral spreading, while steep slopes may fail as landslides or rockfall. The September 2, 1992, St. George earthquake and the earthquake-triggered Springdale landslide demonstrate that secondary geologic hazards can drive substantial consequences during a moderate earthquake.

Location

Comparatively higher probabilistic shaking hazard is mapped in portions of Washington, Iron, Garfield, and Beaver Counties; however, damaging earthquakes may originate from sources other than nearby mapped faults. Relative exposure should therefore be evaluated using shaking, ground-failure susceptibility, development patterns, and asset distribution rather than fault proximity alone.

All participating jurisdictions may experience earthquake ground shaking. Valley and river-corridor deposits may amplify shaking, and susceptible sediments may experience liquefaction or lateral spreading. Steep canyon and mountain terrain may experience landslides or rockfall. Figure 8 shows selected epicenters and Quaternary faults.

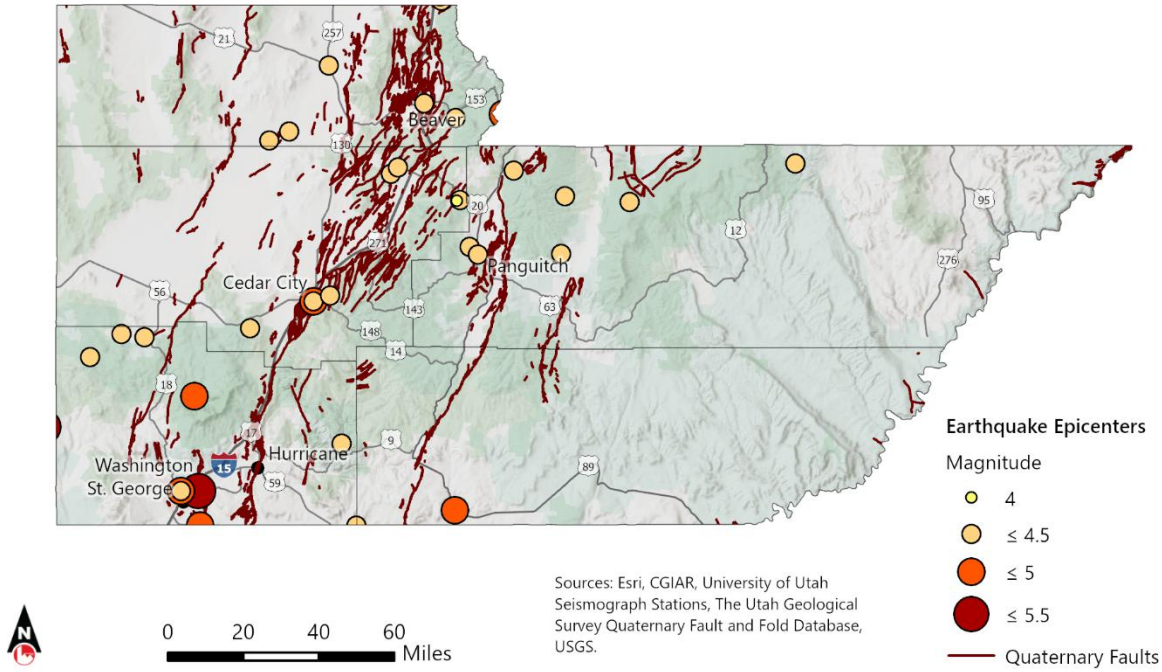


Figure 8: Map of Five Counties Previous Earthquakes Locations and Magnitude

Magnitude and Extent

Extent describes the range of anticipated intensities (i.e., how strong shaking could be) that may affect the planning area. Earthquake extent is described using commonly recognized scientific technical measures of shaking, including the Modified Mercalli Intensity (MMI) scale (observed effects and damage at a location) and instrument-based ground-motion measures (e.g., peak ground acceleration and spectral acceleration) that are used to develop USGS ShakeMaps and probabilistic hazard maps.

Earthquakes are described by magnitude, a source-based measure, and intensity, a location-specific description of shaking effects. Moment magnitude is commonly used for moderate and large earthquakes. The magnitude scale is logarithmic: each whole-number increase represents approximately 32 times more energy release, so an increase from magnitude 4.6 to 6.7 corresponds to approximately 1,400 times more energy. Intensity varies with distance, rupture and wave-path effects, and local site conditions. For mitigation planning, MMI and engineering ground-motion measures can connect hazard extent to expected effects on buildings and lifelines.[31]

Table 14: Modified Mercalli Intensity (MMI) Scale

MMI	General Description of Felt Shaking and Typical Effects
I–II	Not felt to weak shaking; felt by a few people under favorable conditions; little to no damage.
III–IV	Weak to light shaking; felt indoors by many; rattling of dishes/windows; minor non-structural effects possible.
V–VI	Moderate to strong shaking; felt by nearly everyone; some items fall; minor to moderate damage in vulnerable buildings; plaster cracking and small cracks in walls possible.
VII–VIII	Very strong to severe shaking; damage negligible in well-designed buildings but considerable in poorly built structures; chimneys and masonry may be damaged; some structural damage possible.
IX–XII	Violent to extreme shaking; heavy damage to many buildings and lifelines; ground cracking/landslides may occur; at the highest levels, near-total destruction.

Small earthquakes below magnitude 4 occur relatively frequently in the Utah region. Historical and instrumental records should be distinguished from paleoseismic evidence: the absence of a large instrumentally recorded event does not limit the magnitude of credible future earthquakes. Published geologic and seismic studies indicate that faults in southwestern Utah are capable of larger earthquakes than those in the short instrumental record.[32]

[31] U.S. Geological Survey, How much bigger is a magnitude 8.7 earthquake than a magnitude 5.8 earthquake? Energy ratio = 10^(1.5 × magnitude difference); for 6.7 minus 4.6, the ratio is approximately 1,413. https://earthquake.usgs.gov/education/how_much_bigger.php.

[32] Utah Geological Survey, The September 2, 1992 St. George Earthquake, Washington County, Utah, Circular 88, 1993, pp. 1–2 and 21, https://ugspub.nr.utah.gov/publications/circular/c-88.pdf.

Damaging shaking can extend beyond mapped fault traces. Its intensity varies with the earthquake source, distance, local soils, and building vulnerability; an illustrative regional map does not establish the percentage of any county exposed above a defined threshold.

Figure 9 is an illustrative regional intensity map identified in the supplied plan materials with the 2023 U.S. National Seismic Hazard Model (NSHM). The NSHM is a time-independent probabilistic ground-shaking model.

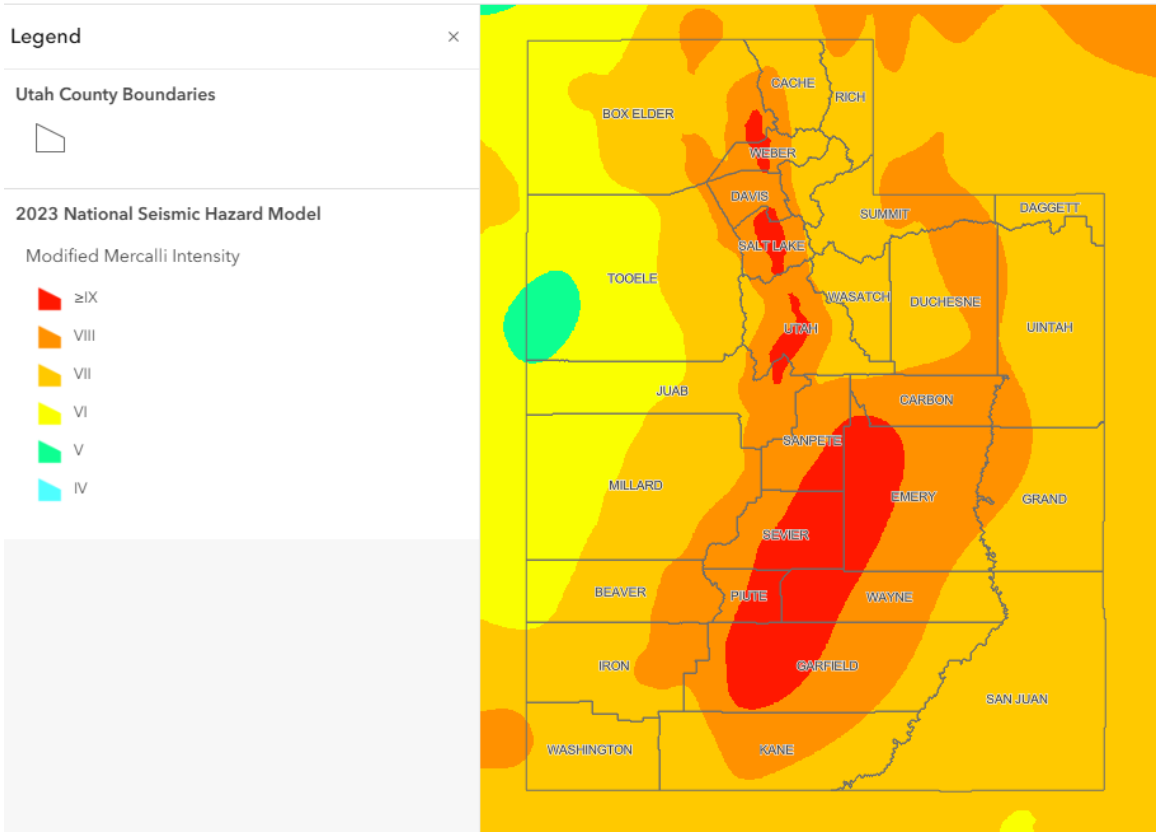


Figure 9: 2023 National Seismic Hazard Model and Utah Counties and Extent of Hazard[33]

BEAVER COUNTY EARTHQUAKE EXTENT

Potentially damaging shaking can affect Beaver County, including locations away from mapped fault traces. Effects depend on local soils, building construction, and the functionality of transportation and utility lifelines.

[33] USGS National Seismic Hazard Model. Earthquake Hazards Program. 2023, https://www.usgs.gov/programs/earthquake-hazards/science/national-seismic-hazard-model.

GARFIELD COUNTY EARTHQUAKE EXTENT

Potentially damaging shaking can affect Garfield County. Local site conditions and susceptible buildings influence damage; the available map does not establish that this county has the region's highest intensity.

IRON COUNTY EARTHQUAKE EXTENT

Potentially damaging shaking can affect Iron County. Population centers and lifelines along the Interstate 15 corridor may experience building damage and transportation or utility disruption.

KANE COUNTY EARTHQUAKE EXTENT

Regional earthquake sources can produce ground shaking in Kane County. Building vulnerability, local soils, and access to response services influence consequences.

WASHINGTON COUNTY EARTHQUAKE EXTENT

Potentially damaging shaking can affect Washington County. The 1992 St. George earthquake demonstrates building damage and earthquake-triggered slope failure; these secondary hazards can compound damage to structures, roads, and utilities.

Previous Occurrences

Earthquakes occur regularly in and near the five-county region, although most are small and cause little or no damage. The USGS Earthquake Catalog and Utah earthquake catalogs should be used to document location, origin time, magnitude type, depth, and source uncertainty. Figure 8 maps selected local earthquakes, whereas Figure 10 is a broader Utah-region mainshock map through 2012. The figures represent separate datasets; the Point ID column in Table 15 corresponds to Figure 10.

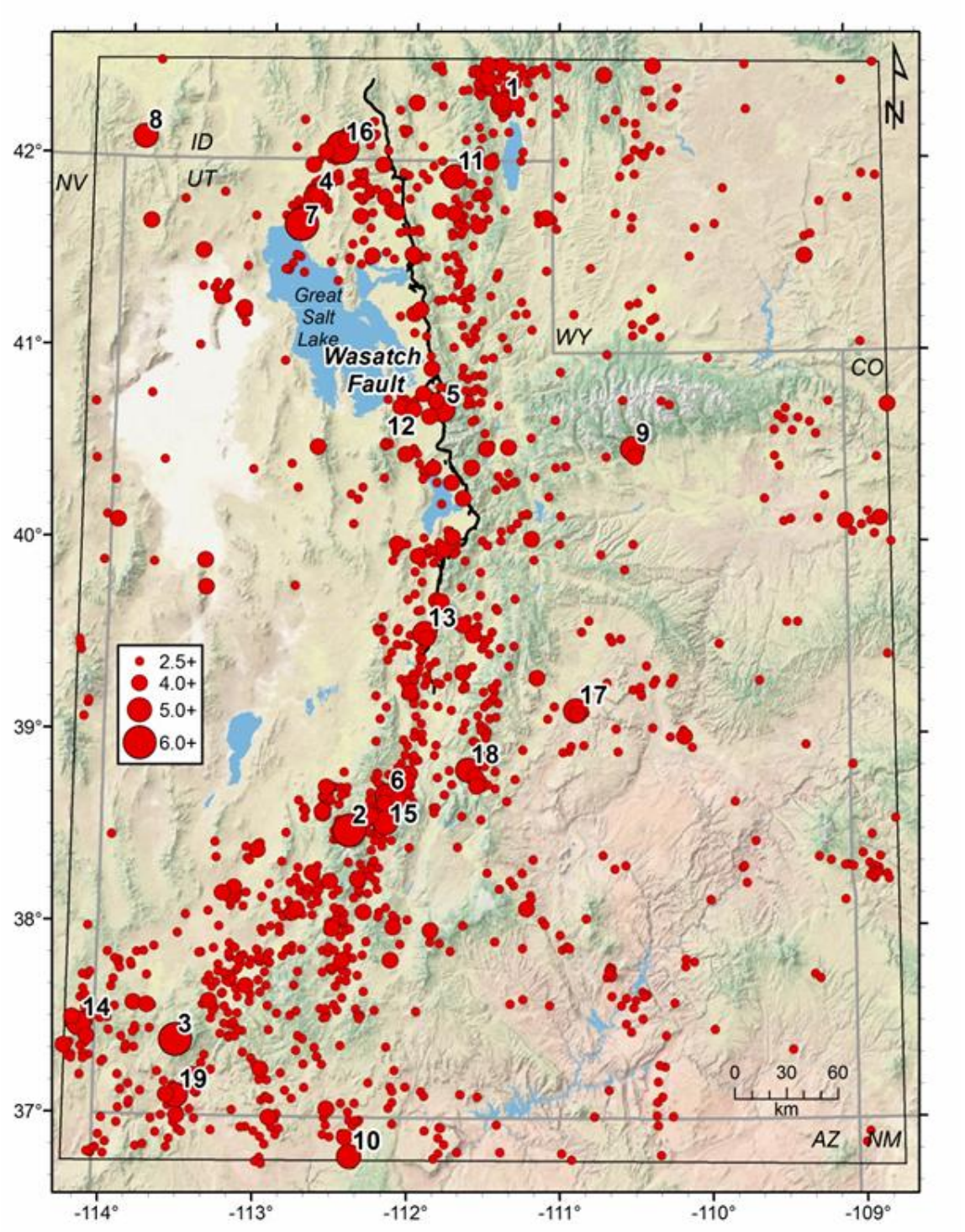


Figure 10: Epicenter Map of Independent Mainshocks in the Utah Region, 1850–2012[34]

[34] Earthquake Probabilities for the Wasatch Front Region in Utah, Idaho, and Wyoming. Working Group on Utah Earthquake Probabilities, Utah Geological Survey Misc Publication 16-3, 2016, https://ugspub.nr.utah.gov/publications/misc_pubs/mp-16-3/mp-16-3.pdf.

Table 15: Earthquake History Magnitude 5 and Over

Point ID*	Year	Region	Magnitude	County
2	1901	Tushar Mountains	6.63	Beaver
3	1902	Pine Valley	6.34	Washington/Iron
10	1959	Arizona–Utah Border	5.55	Washington/Kane
14	1966	Nevada–Utah Border	5.22	Washington
19	1992	Approximately 5 miles east-southeast of St. George	5.8	Washington

*Point ID column relates to Figure 10.

Table 16: Additional Earthquake Events[35]

Incident Date (year)	Location	Magnitude	Description (if available)
1873	Beaver City, Beaver County	4.05	A magnitude 4.05 earthquake recorded within the Beaver City municipal boundary.
1908	Milford, Beaver County	4.05	A magnitude 4.05 earthquake recorded within the Milford municipal boundary.
1923	Minersville, Beaver County	4.05	A magnitude 4.05 earthquake recorded 21.5 miles southwest of Minersville.
1966	Minersville, Beaver County	4.17	A magnitude 4.17 earthquake recorded 16.2 miles southwest of Minersville.
1998	Beaver City, Beaver County	4.48	A magnitude 4.48 earthquake recorded 9 miles southeast of Beaver City.
1963	Boulder, Garfield County	4.3	A magnitude 4.3 earthquake recorded 14 miles northeast of Boulder.
1966	Antimony, Garfield County	4.1	A magnitude 4.1 earthquake recorded 8.6 miles southeast of Antimony.
1991	Escalante, Garfield County	4.0	A magnitude 4.0 earthquake recorded 17.2 miles southeast of Escalante.
1994	Antimony, Garfield County	4.03	A magnitude 4.03 earthquake recorded 16.3 miles west of Antimony.
2012	Bryce Canyon City, Garfield County	4.13	A magnitude 4.13 earthquake recorded 9 miles north of Bryce Canyon City.

[35] *Five County Association of Governments (FCAOG), Hazard Mitigation Plan 2022–2027 and Utah Enhanced State Hazard Mitigation Plan, 2024.*

Incident Date (year)	Location	Magnitude	Description (if available)
2015	Panguitch, Garfield County	4.09	A magnitude 4.09 earthquake recorded 1.5 miles northwest of Panguitch.
1981	Cedar City, Iron County	4.18	A magnitude 4.18 earthquake recorded 7.2 miles southwest of Cedar City.
1991	Paragonah, Iron County	4.63	A magnitude 4.63 earthquake recorded 12.2 miles north of Paragonah.
1992	Cedar City, Iron County	4.19	A magnitude 4.19 earthquake recorded 2 miles northwest of Cedar City.
1992	Cedar City, Iron County	4.17	A magnitude 4.17 earthquake recorded 1.8 miles northwest of Cedar City.
1999	Paragonah, Iron County	4.11	A magnitude 4.11 earthquake recorded 13.7 miles north of Paragonah.
2010	Cedar City, Iron County	4.12	A magnitude 4.12 earthquake recorded 3.8 miles southeast of Cedar City.
1887	Kanab, Kane County	4.8	A magnitude 4.8 earthquake recorded near Kanab.
1881	Enterprise, Washington County	4.05	A magnitude 4.05 earthquake recorded near Enterprise.
1891	St. George, Washington County	4.81	A magnitude 4.81 earthquake recorded near St. George.
1902	Washington County	4.81	A magnitude 4.81 earthquake recorded in Washington County.
1903	St. George, Washington County	4.05	A magnitude 4.05 earthquake recorded near St. George.
1914	Enterprise, Washington County	4.05	A magnitude 4.05 earthquake recorded near Enterprise.
1920	St. George, Washington County	4.05	A magnitude 4.05 earthquake recorded near St. George.
1936	Washington County	4.05	A magnitude 4.05 earthquake recorded in Washington County.
1992	Approximately 5 miles east-southeast of St. George, Washington County	5.8	The September 2 event damaged structures in Hurricane, La Verkin, Washington, and St. George; the earthquake-triggered Balanced Rock Hills landslide near Springdale destroyed three homes, disrupted utilities, and closed State Route 9.
2016	Enterprise, Washington County	4.35	A magnitude 4.35 earthquake recorded near Enterprise.

At 4:26 a.m. MDT on September 2, 1992, an earthquake occurred approximately 5 miles east-southeast of St. George. The University of Utah assigned local magnitude 5.8. Investigators considered a buried projection of the Hurricane fault a possible source, rather than establishing a definitive fault association. Building damage was documented in Hurricane, La Verkin, Washington, and St. George. The Balanced Rock Hills landslide in Springdale destroyed three homes, disrupted utilities, and closed State Route 9 at the southwest entrance to Zion National Park.[36]

Probability of Future Occurrences

Earthquake probability is rated Occasional for damaging earthquake impacts, consistent with the plan's approximate 10- to 100-year category. This is a qualitative planning classification based on the historical damaging-event record, including the 1992 earthquake; it is not a calculated annual probability or a classification of all small earthquakes.

The historical event list is a selected record, not a complete earthquake catalog from which an annual damaging-event rate can be calculated. National Risk Index values are not used as direct annual earthquake probabilities in this assessment.

The supplied regional shaking map illustrates potential shaking consequences. Its undocumented probability level and site condition preclude using it to derive annual event probability.

The historical record is consistent with an Occasional likelihood when focusing on earthquakes that produce damage rather than the more frequent, low-impact seismicity that occurs statewide. As summarized in Table 15 and the previous discussion, the five-county area has experienced recurring moderate earthquakes (many in the magnitude 4 range) and at least one notable damaging event in Washington County (1992) that produced structural damage and triggered secondary hazards (e.g., landsliding). This pattern, frequent felt events punctuated by less frequent damaging earthquakes, supports the qualitative Occasional classification without assigning a numerical annual probability.

Development growth in Washington County and portions of Iron County increases the number and value of people, buildings, and infrastructure exposed to earthquake effects. Future conditions for earthquake risk should focus on changes in exposure and vulnerability, including development near faults or susceptible soils, aging infrastructure, code adoption and enforcement, retrofit activity, and lifeline interdependencies. NCA5-based climate projections are not applicable to the probability of tectonic earthquakes and are not added to this hazard profile.

Vulnerability Assessment

Earthquake vulnerability in the five-county planning area reflects the interaction of ground shaking and secondary hazards with people, buildings, critical facilities, infrastructure, economic activity, and natural,

[36] Utah Geological Survey, The September 2, 1992 St. George Earthquake, Washington County, Utah, Circular 88, 1993, pp. 1–2 and 21, https://ugspub.nr.utah.gov/publications/circular/c-88.pdf.

historic, and cultural resources. Consequences vary with shaking intensity, local soils and slopes, construction type and age, code level, retrofit status, occupancy, access and functional needs, and the availability and redundancy of transportation, utilities, communications, emergency response, and medical services. Older unreinforced masonry, weak or unbraced parapets, nonductile construction, heavy roof systems, and inadequately anchored contents and equipment can increase losses, while liquefaction, lateral spreading, surface rupture, landslides, and rockfall may compound direct shaking damage in susceptible locations.

Unreinforced Masonry: Table 4 summarizes identified or likely unreinforced masonry in school facilities. These entries describe the school inventory and do not constitute a complete inventory of all unreinforced masonry buildings in each county. Jurisdiction-specific building inventories and current retrofit or replacement information are needed to characterize this vulnerability more fully.

Table 17: FCAOG Counties with Unreinforced Masonry Structures (URM)

County	Number of Unreinforced Masonry Structures
Beaver	No unreinforced masonry structure (URM) schools[37]
Garfield	Campuses with URM, 2 buildings or additions with identified URM: Escalante School and Panguitch School. Current retrofit or replacement status is not established by this inventory
Iron	1 campus and 1 building or addition with identified URM (Cedar City High)
Kane	2 campuses with identified URM, 2 buildings or additions with identified URM, 1 campus with likely URM (Kanab School and Valley High)
Washington	1 campus with likely URM

BEAVER COUNTY

Beaver County and its participating municipalities—Beaver City, Milford, and Minersville—are susceptible to damaging ground shaking, including shaking from earthquakes outside the county. The county's communities, dispersed development, public facilities, businesses, and road and utility networks may experience falling contents, nonstructural damage, structural damage, or service interruption. Table 2 identifies the 1901 magnitude 6.63 Tushar Mountains event in Beaver County, and Table 3 lists additional earthquakes near Beaver City, Milford, and Minersville.

Vulnerability is greatest where older or otherwise vulnerable buildings, unanchored equipment, and critical services coincide with stronger shaking or adverse site conditions. Table 4 identifies no unreinforced masonry schools in Beaver County, but that finding does not represent a complete

[37] Utah K-12 Public Schools Unreinforced Masonry Inventory. 2022, Applied Technology Council for Utah Division of Emergency Management, https://earthquakes.utah.gov/wp-content/uploads/Utah-K-12-Public-Schools-URM-Inventory-2022.pdf.

countywide URM inventory. Rural distances and limited alternate routes may delay response, access to medical care, inspections, utility restoration, and delivery of materials needed for recovery.

Cascading Impacts: Damage to roads, bridges, power, communications, fuel, water, or wastewater systems could restrict emergency response and isolate communities or outlying properties. Utility interruption or transportation damage could close schools and public facilities, disrupt local businesses and supply chains, and affect agricultural, mining, tourism, and recreation activity. Ground failure, landslides, or rockfall in susceptible terrain could further block routes and damage infrastructure.

Changes in Development: New development increases the number and value of exposed people, buildings, and infrastructure even when modern seismic provisions reduce damage potential. Growth near mapped faults, susceptible soils, steep terrain, or lifeline corridors may increase consequences, while code adoption and enforcement, retrofit activity, anchored nonstructural components, and replacement of vulnerable facilities may reduce vulnerability. Available information does not support a quantitative determination of how development since the prior plan has changed countywide earthquake vulnerability.

GARFIELD COUNTY

Garfield County and its participating municipalities—Antimony, Boulder, Bryce Canyon City, Cannonville, Escalante, Hatch, Henrieville, Panguitch, and Tropic—are susceptible to damaging ground shaking and earthquake-triggered ground failure. Communities are distributed across extensive rural terrain, and consequences may include damage to residences, businesses, schools, public buildings, roads, utilities, and visitor-serving facilities. Table 16 documents magnitude 4-range events near Boulder, Antimony, Escalante, Bryce Canyon City, and Panguitch.

Older buildings, unreinforced masonry, unanchored contents, steep slopes, and limited route redundancy increase vulnerability. Table 17 identifies URM at Escalante School and Panguitch School, although current retrofit or replacement status is not established and the table is not a complete building inventory. Residents with access and functional needs and visitors unfamiliar with local conditions may require additional assistance, while long travel distances may delay emergency response, inspection, sheltering, and restoration.

Cascading Impacts: Shaking-related landslides or rockfall could close canyon and mountain routes, isolate communities, and restrict access to schools, healthcare, public safety facilities, parks, and recreation destinations. Damage to electric power, communications, water, wastewater, or fuel systems could interrupt government and business operations and prolong closures. Transportation and utility disruption could also reduce tourism activity, delay supply deliveries, and complicate mutual-aid access across the county.

Changes in Development: Residential, commercial, public, and visitor-serving development adds exposed assets, including in communities dependent on a limited number of routes and utility connections. Modern codes and replacement of vulnerable buildings can reduce life-safety risk, but new development remains exposed to shaking and secondary hazards. Siting near unstable slopes or

susceptible soils, infrastructure expansion, retrofit activity, and the condition of older facilities will shape future vulnerability; available data do not quantify the net change since the prior plan.

IRON COUNTY

Iron County and its participating municipalities—Brian Head, Cedar City, Enoch, Paragonah, and Parowan—are susceptible to damaging ground shaking. Concentrated development and lifelines along the Interstate 15 corridor create the potential for correlated building, transportation, and utility losses, while mountain communities and outlying areas may have fewer alternate access routes. Table 16 records several magnitude 4-range earthquakes near Cedar City and Paragonah, demonstrating recurring local seismicity.

People, residences, businesses, schools, emergency facilities, government buildings, utilities, and transportation assets may be affected by structural and nonstructural damage. Table 17 identifies one building or addition with URM at Cedar City High; it is not a complete countywide URM inventory. Vulnerability also depends on building age and condition, anchorage of equipment and contents, local soils, slope conditions, and the ability of critical facilities and service providers to continue operating after an event.

Cascading Impacts: Damage along the Interstate 15 corridor could impede regional emergency response, freight movement, commuting, and access between communities. Failure of power, communications, natural gas, fuel, water, or wastewater systems could interrupt healthcare, education, government, and business operations, while fire or hazardous-material releases could create additional response demands. Landslides or rockfall may affect steep routes and mountain access, potentially isolating Brian Head or other outlying areas.

Changes in Development: Continued growth in and around Cedar City, Enoch, and the Interstate 15 corridor increases the population, building stock, and infrastructure exposed to earthquake effects. Code-compliant construction may perform better than older vulnerable buildings, but growth can increase absolute losses and dependence on interconnected lifelines. Redevelopment, infrastructure aging, retrofit and replacement decisions, nonstructural anchorage, and development on susceptible soils or slopes will determine whether overall vulnerability increases or decreases; available data do not quantify the net change since the prior plan.

KANE COUNTY

Kane County and its participating municipalities—Alton, Big Water, Glendale, Kanab, and Orderville—are susceptible to regional earthquake ground shaking. The 1887 magnitude 4.8 event near Kanab listed in Table 16 and the Arizona–Utah border event identified in Table 15 illustrate that earthquakes in and near the county can affect its communities. Dispersed settlement, extensive public lands, visitor activity, and long travel distances shape the county's vulnerability.

Damage may affect residences, businesses, schools, public and emergency facilities, roads, communications, and utility systems. Table 17 identifies two campuses and two buildings or additions with URM, plus one campus with likely URM, at Kanab School and Valley High; this is not a complete countywide inventory. Older construction, unanchored contents, limited response and medical resources, and dependence on a small number of transportation and utility connections may extend disruption.

Cascading Impacts: Road damage, rockfall, or slope failure could restrict access between communities and to remote recreation areas, delay mutual aid, and strand residents or visitors. Interruption of electric power, communications, fuel, water, or wastewater service could close public facilities and businesses and complicate emergency operations. Reduced highway access and prolonged utility outages could also disrupt tourism, supply deliveries, household recovery, and continuity of government.

Changes in Development: New residential and visitor-serving development increases exposed assets and may increase demand on routes, utilities, and emergency services with limited redundancy. Modern seismic design, replacement or retrofit of vulnerable schools and public buildings, and secured nonstructural components can reduce consequences, while development near steep slopes, susceptible soils, or constrained access routes may increase them. Available information does not establish a quantified countywide change in earthquake vulnerability since the prior plan.

WASHINGTON COUNTY

Washington County and its participating municipalities—Apple Valley, Enterprise, Hildale, Hurricane, Ivins, La Verkin, Leeds, New Harmony, Rockville, Santa Clara, Springdale, St. George, Toquerville, Virgin, and Washington City—have substantial exposure to damaging shaking and secondary hazards. The 1992 St. George earthquake caused building damage in Hurricane, La Verkin, Washington, and St. George, while the earthquake-triggered Balanced Rock Hills landslide in Springdale destroyed three homes, disrupted utilities, and closed State Route 9.

The county's comparatively large and growing population, concentrated urban development, schools, healthcare and public-safety facilities, businesses, tourism assets, and interconnected lifelines create the potential for significant direct and indirect losses. Table 17 identifies one school campus with likely URM, but this does not represent a complete county URM inventory. Vulnerability is also influenced by active fault zones, susceptible soils, steep terrain, older buildings, nonstructural components, high visitor populations, and reliance on major transportation and utility corridors.

Cascading Impacts: Strong shaking may trigger landslides, rockfall, liquefaction, lateral spreading, fires, hazardous-material releases, and failures of water, wastewater, power, natural gas, fuel, transportation, or communications systems. Simultaneous damage could constrain emergency response and healthcare access, displace households, close schools and government facilities, and interrupt regional commerce and tourism. Route closures near Zion National Park or along Interstate 15 and other key corridors could compound economic losses and isolate communities.

Changes in Development: Rapid growth and redevelopment, particularly in the St. George urban area and other communities along major corridors, increase the number and value of people and assets

exposed to earthquake effects. Newer code-compliant buildings may reduce relative life-safety risk, but expansion onto susceptible soils, near mapped faults, or beneath unstable slopes may create additional exposure, while greater reliance on interdependent lifelines can increase cascading consequences. Code enforcement, retrofit of older and critical facilities, nonstructural anchorage, infrastructure redundancy, and risk-informed siting will influence future vulnerability; available information does not quantify the net countywide change since the prior plan.

LOSS ESTIMATES

The Hazus analysis models an M5.9 earthquake scenario. Although similar in magnitude to the 1992 St. George earthquake (local magnitude 5.8), the scenario represents a planning-level modeled event rather than an exact recurrence. The results provide illustrative estimates of potential damage, economic loss, displacement, debris, and lifeline impacts and should be interpreted in light of model and inventory uncertainty.

Building-stock counts, occupancy proportions, and replacement valuations cannot be reconciled to an archived inventory in the supplied materials and are not reported here. The displayed scenario losses do not establish the total replacement value of regional assets.

The county maps distinguish general building-stock losses from user-defined-facility losses. A dated facility inventory and documented update method are unavailable, so facility counts and inventory-completeness claims are not assigned.

The following results summarize modeled building damage, economic loss, displacement, shelter needs, debris, critical-facility effects, and transportation and utility impacts. Hazus estimates are planning-level results, not predictions. Results depend on hazard inputs, inventory completeness, vulnerability functions, occupancy assumptions, and other model parameters and should be interpreted with appropriate uncertainty.

SCENARIO 1: MODELED M5.9 EARTHQUAKE

Hazus estimates that about 62 buildings would be at least moderately damaged, about 88% of those are projected to be single-family or other residential structures, and 10.5% commercial buildings. The damage modeled did not indicate that any households were expected to be displaced from their homes or require temporary public shelter.

The model did not indicate any damage or loss of functionality to critical facilities, nor any loss of functionality to transportation or utility systems. An estimated $2.38 million in economic loss was modeled to transportation systems, including $2.06 million to airport facilities, $300,000 to bus facilities, and $18,000 to highway bridges. Utility systems were modeled to experience $36.85 million in economic losses, including $31.2 million to electric power facilities, $4.8 million to wastewater systems, $417,900 to natural gas systems, $378,800 in losses to potable water systems, and $58,700 to communication facilities. An estimated 2,000 tons of debris would be generated, which would require 80 truckloads to remove.

The total economic loss estimated for this earthquake is $105.43 million, which includes building and lifeline-related losses. Building losses include direct building losses and losses from business interruption. Direct building losses are the estimated costs to repair or replace the damage caused to a building and its contents. Business interruption losses are associated with the inability to operate a business due to earthquake damage. Total building-related economic losses are estimated at $66.2 million, with $64.8 million due to direct losses and $1.36 million from business interruption or income losses.

As shown in Figure 11, non-structural and content losses account for the largest proportion of economic losses. Residences experience the highest value of building-related economic losses, followed by commercial. Table 18 shows both direct and business interruption losses for each major occupancy type.

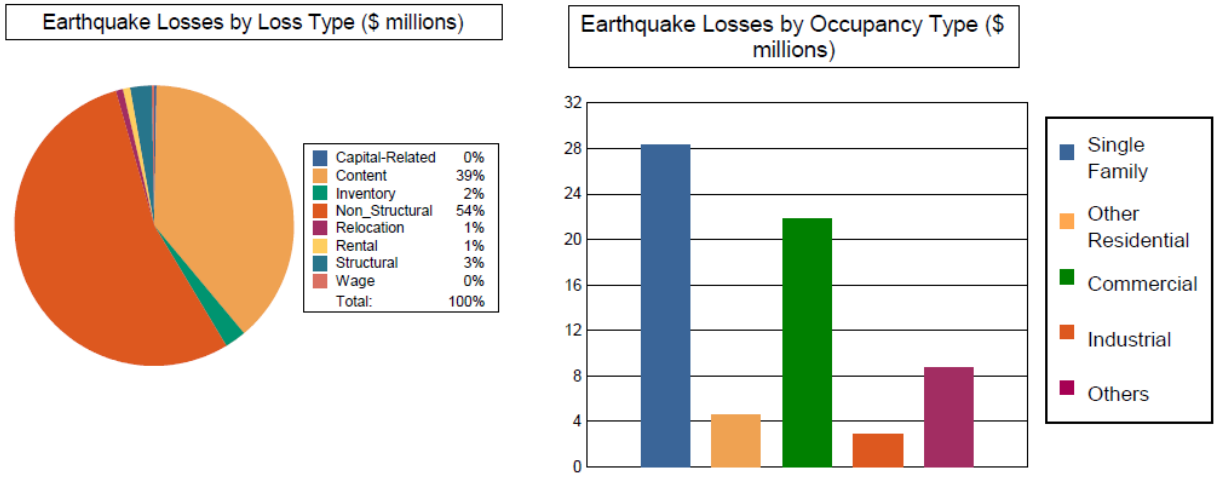


Figure 11: Earthquake Losses

Table 18: Building-Related Economic Loss by Occupancy Type (Millions of Dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses	Wage	0.0000	0.0106	0.1333	0.0027	0.0516	0.1982
	Capital-related	0.0000	0.0045	0.1587	0.0016	0.0203	0.1851
	Rental	0.1125	0.0522	0.2272	0.0016	0.0145	0.4080
	Relocation	0.2770	0.0310	0.1624	0.0061	0.0927	0.5692
	Subtotal	**0.3895**	**0.0983**	**0.6816**	**0.0120**	**0.1791**	**1.3605**
Capital Stock Losses	Structural	1.1244	0.1234	0.3626	0.0262	0.0792	1.7158
	Non-Structural	16.7585	3.0453	10.7825	1.5244	3.8428	35.9535
	Content	10.0442	1.2405	8.6327	1.0950	4.5272	25.5396
	Inventory	0.0000	0.0000	1.3662	0.2234	0.0419	1.6315

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
	Subtotal	**27.9271**	**4.4092**	**21.1440**	**2.8690**	**8.4911**	**64.8404**
Total		**28.32**	**4.51**	**21.83**	**2.88**	**8.67**	**66.20**

Figure 12 through Figure 17 show the supplied magnitude-5.9 scenario's economic-loss displays; Figure 18 through Figure 20 show its shaking displays. Additional county shaking maps and a second analysis are not supplied. The maps are illustrative model outputs, not verified inventories or independent loss estimates.

Readable map legend: general building-stock loss classes have upper limits of $89,923, $431,616, $894,602, $2,842,646, and $8,204,989, from light to dark shading. User-defined-facility symbols have upper limits of $983,556, $8,081,945, $36,693,012, $95,722,288, and $240,011,024. These are class limits, not county totals. The shaking legends progress from weakest (light blue) through weaker (light green), light (pale yellow), strong (pale orange), and strongest (orange); no calibrated MMI values are supplied.

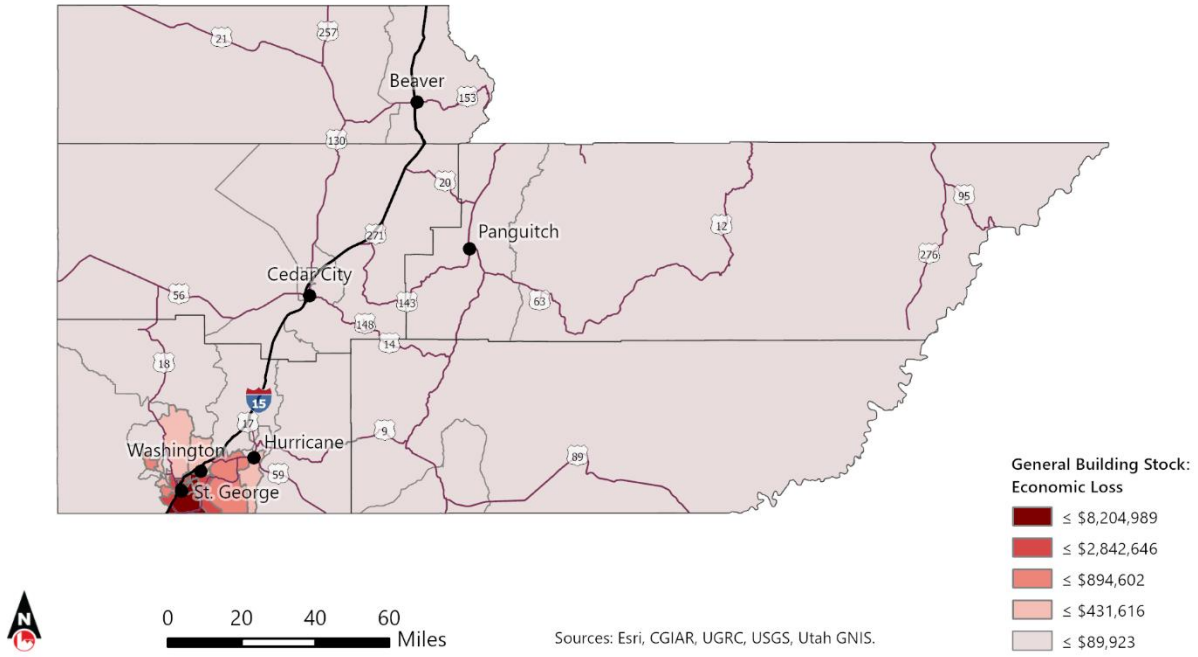


Figure 12: Economic Loss in Five-County Area for Modeled M5.9 Earthquake Scenario

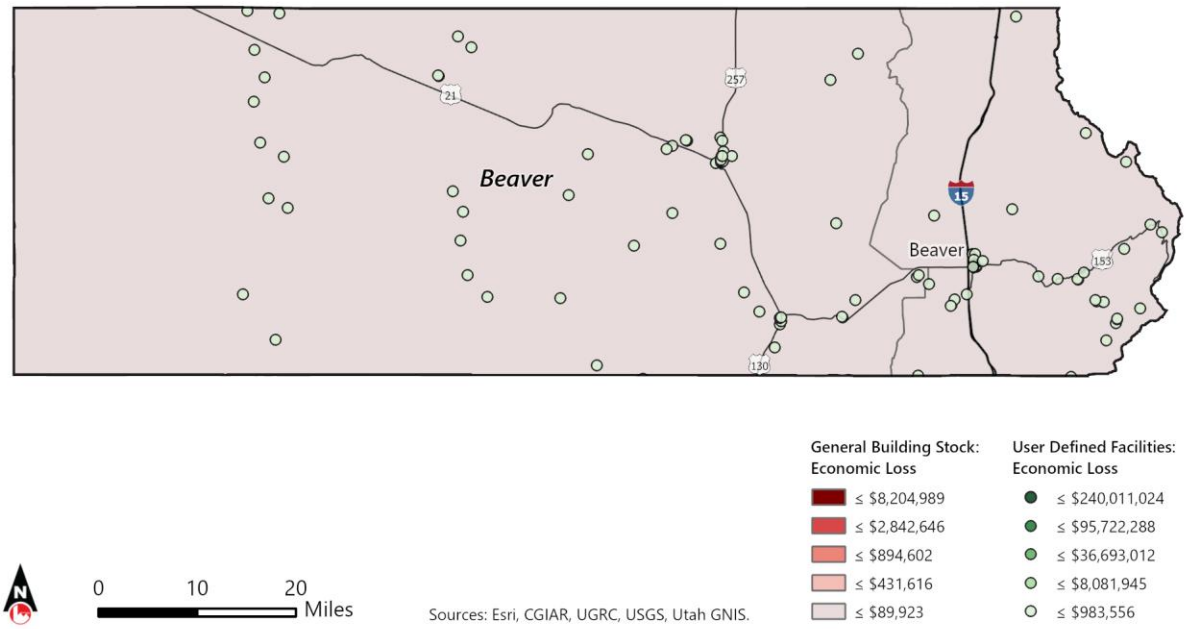


Figure 13: Economic Loss and User-Defined Facilities in Beaver County for M5.9 Scenario

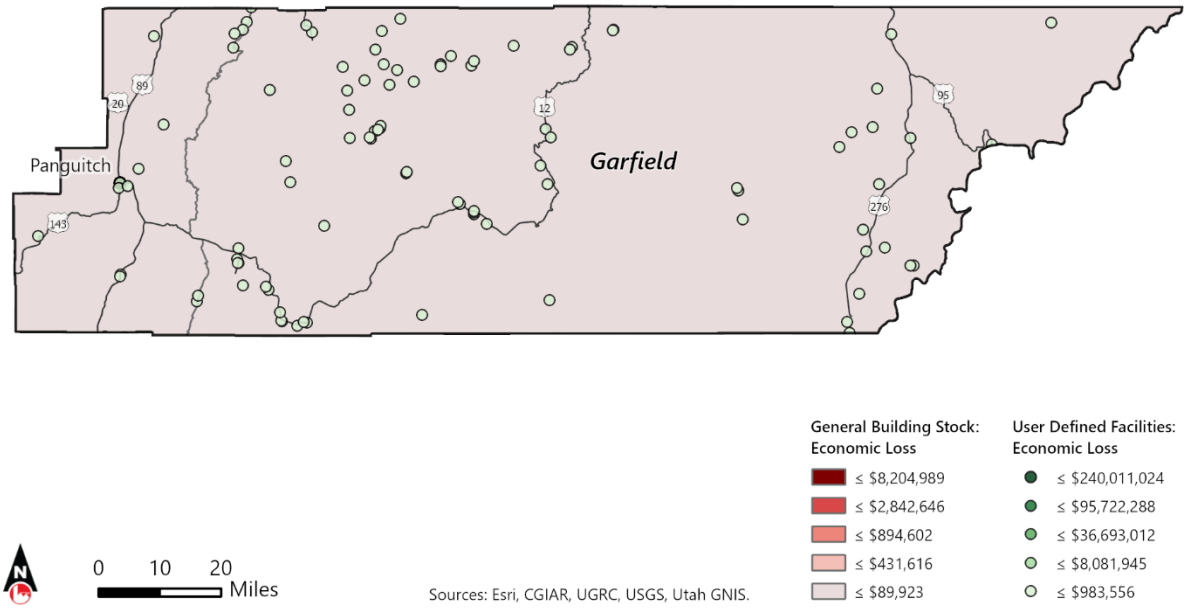


Figure 14: Economic Loss and User-Defined Facilities in Garfield County for M5.9 Scenario

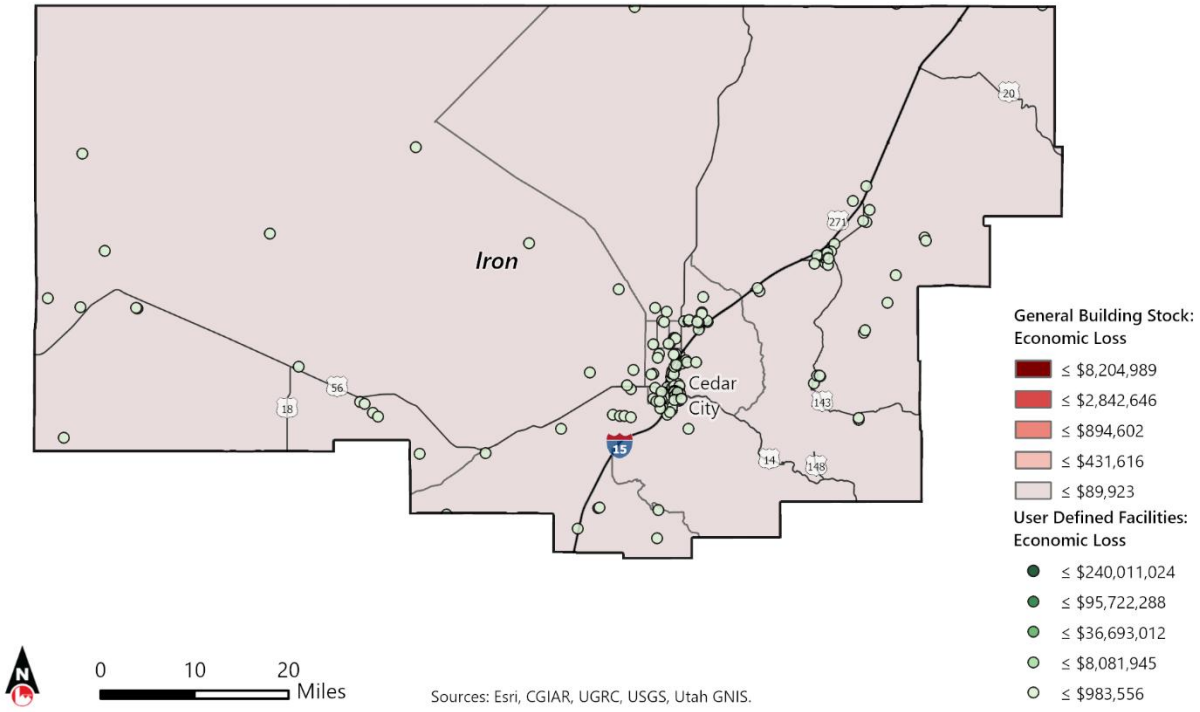


Figure 15: Economic Loss and User-Defined Facilities in Iron County for M5.9 Scenario

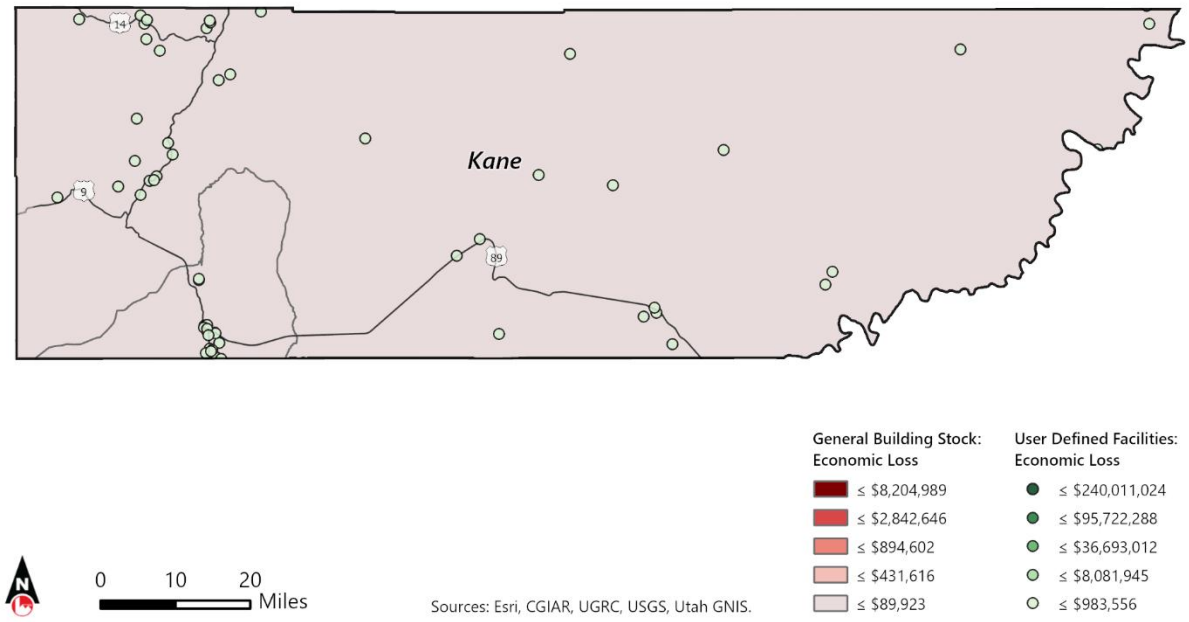


Figure 16: Economic Loss and User-Defined Facilities in Kane County for M5.9 Scenario

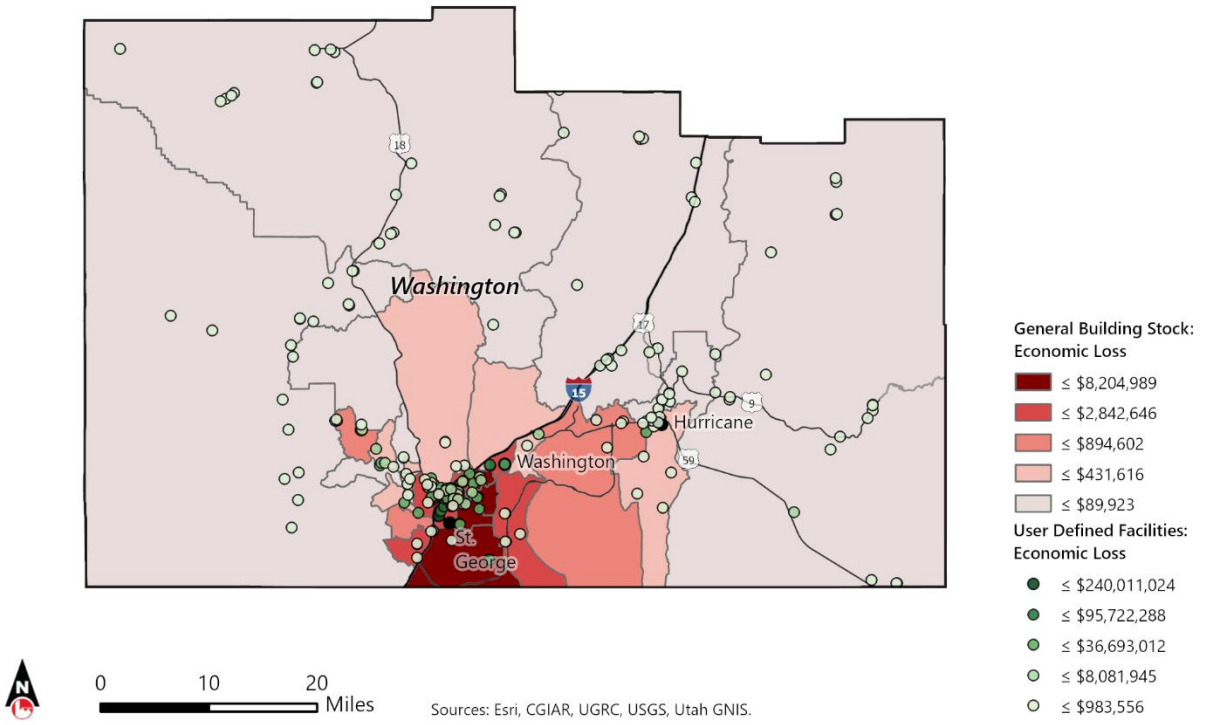


Figure 17: Economic Loss and User-Defined Facilities in Washington County for M5.9 Scenario

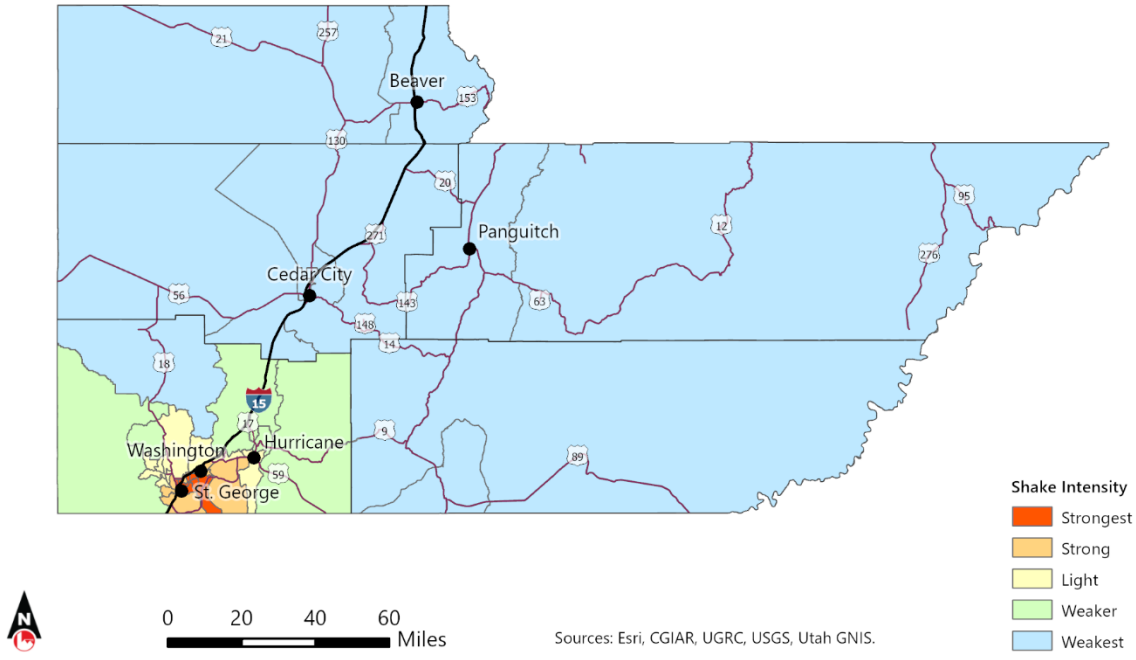


Figure 18: Shake Intensity for Five-County Region M5.9 Scenario

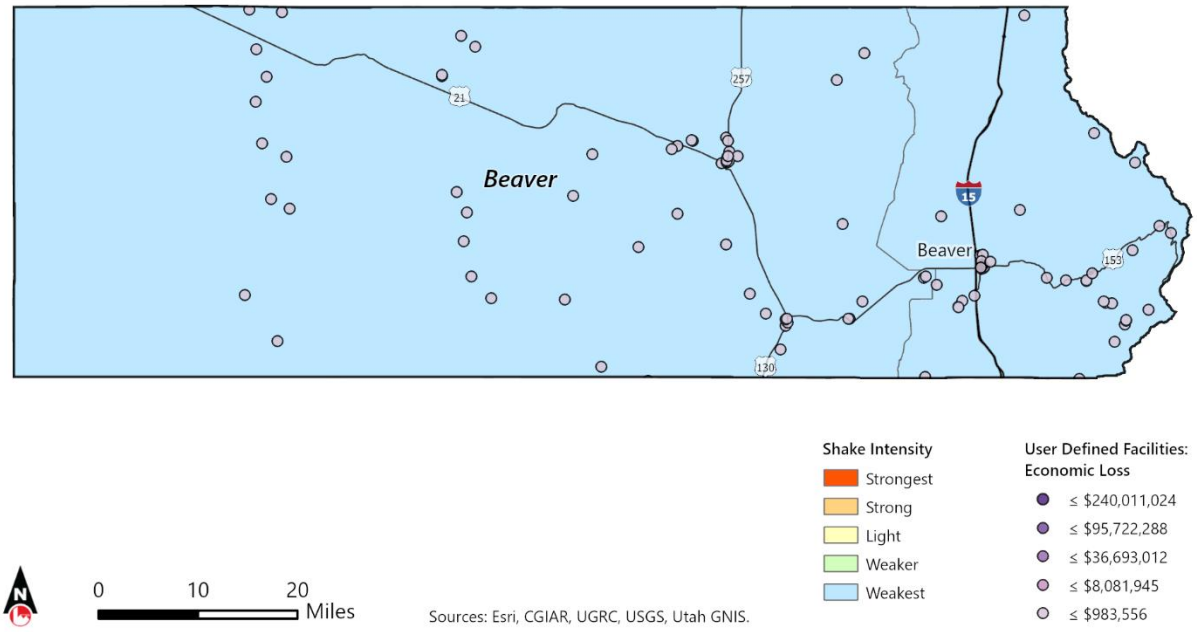


Figure 19: Shake Intensity for Beaver County for M5.9 Scenario

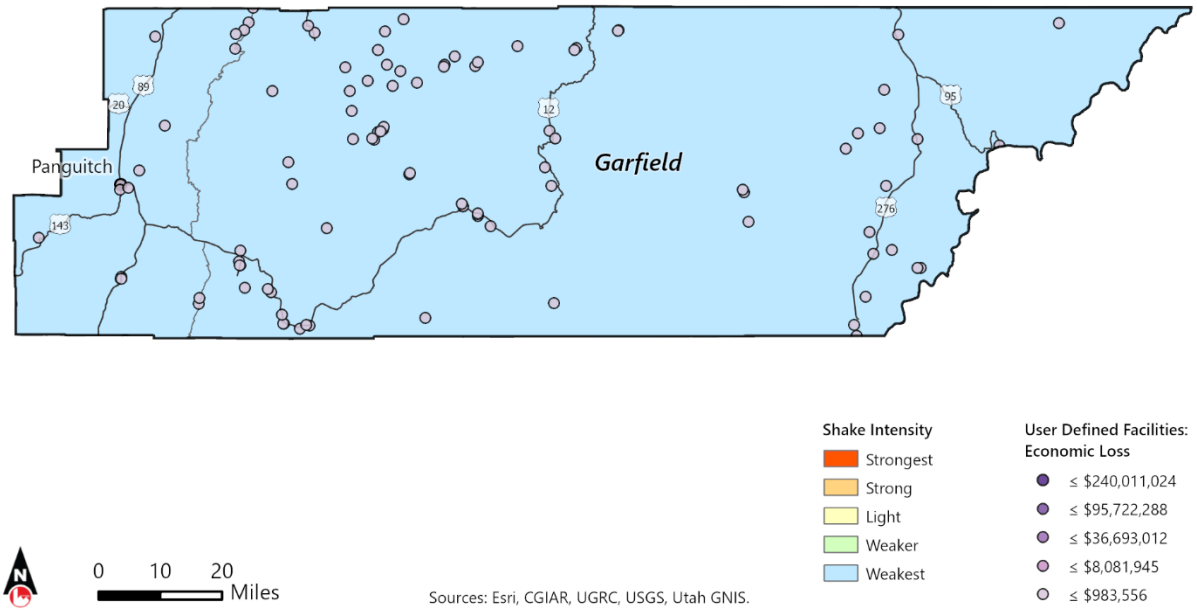


Figure 20: Shake Intensity for Garfield County for M5.9 Scenario

Extreme Heat

Extreme heat occurs when local weather conditions are substantially hotter than normal and create increased risk to health, infrastructure, ecosystems, or community functions. Because risk depends on local climate, season, duration, nighttime temperatures, humidity, solar exposure, wind, and population sensitivity, no single air-temperature threshold defines extreme heat throughout the planning area. A heat wave is a period of abnormally hot weather generally lasting more than two days. A persistent high-pressure pattern can trap warm air and contribute to a heat dome, but these terms describe related meteorological conditions rather than separate hazards.[38]

Extreme heat can cause serious illness and death. The body can become unable to dissipate heat fast enough, leading to dehydration, heat cramps, heat exhaustion, or life-threatening heat stroke. Humidity can reduce evaporative cooling, while direct sun, exertion, limited air movement, warm nights, inadequate hydration, and lack of access to cooling also increase risk. Health impacts can occur below fixed temperature thresholds because risk is relative to local conditions and individual susceptibility.[39]

Although much of the planning area is rural, developed communities may experience urban heat-island effects where roofs, pavement, and other built surfaces absorb and retain heat and where limited shade and vegetation reduce cooling. Higher nighttime temperatures can limit recovery from daytime heat and increase health risks. The magnitude of this effect varies by land cover, development pattern, elevation, and local weather and should not be represented by one uniform temperature difference without local analysis.[40]

NOAA NCEI 1991–2020 Climate Normals provide the current standard 30-year baseline for describing typical station conditions. July is generally the hottest month at the selected stations, although hazardous heat can occur from late spring into early fall. Figures 1 through 5 show monthly normals for one observation station in each county; Table 19 includes additional stations to illustrate substantial local variation associated primarily with elevation and terrain.[41]

The July normal maximum temperature at Milford Municipal Airport is 95°F, as shown in Figure 21.

[38] National Weather Service, During a Heat Wave; heat-wave definition and heat safety guidance. https://www.weather.gov/safety/heat-during

[39] CDC/NIOSH, Heat-related Illnesses, March 3, 2026; National Weather Service, Heat Safety. https://www.cdc.gov/niosh/heat-stress/about/illnesses.html ; https://www.weather.gov/safety/heat

[40] U.S. Environmental Protection Agency, Heat Island Effects, March 12, 2026. https://www.epa.gov/heatislands/heat-island-effects

[41] NOAA NCEI, U.S. Climate Normals, 1991–2020 standard normals. https://www.ncei.noaa.gov/products/land-based-station/us-climate-normals

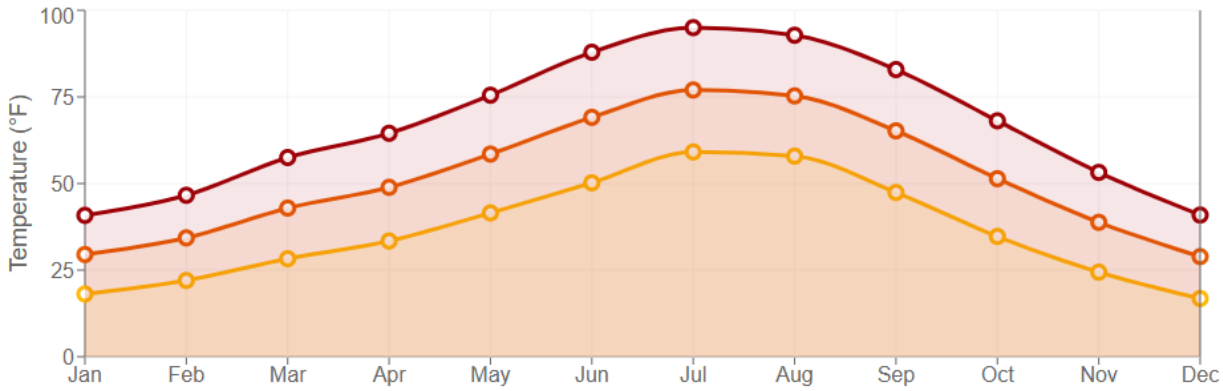


Figure 21: Average Temperature, Milford Municipal Airport, Utah, 1991–2020[42]

The July normal maximum temperature at Panguitch is 86.1°F, as shown in Figure 22.

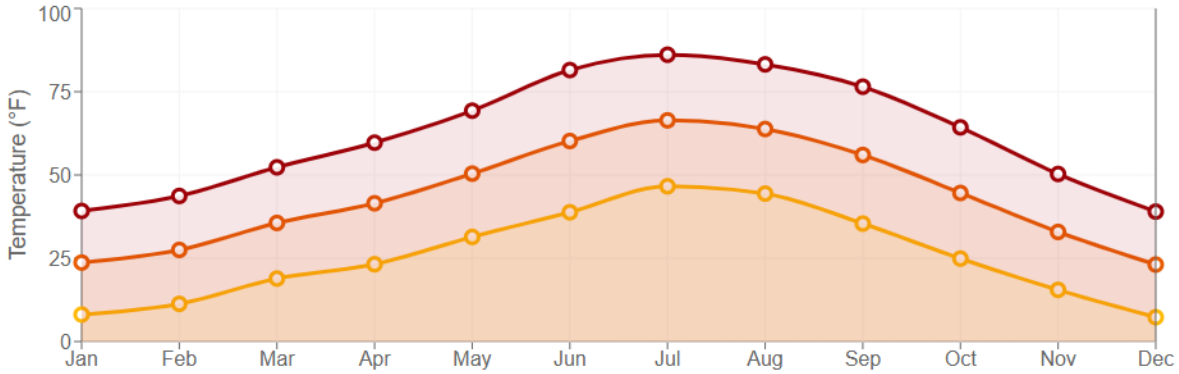


Figure 22: Average Temperature, Panguitch, Utah, 1991–2020

The July normal maximum temperature at Kanab is 94.2°F, as shown in Figure 23.

[42]National Oceanic and Atmospheric Administration, National Centers for Environmental Information, U.S. Climate Normals, 1991–2020 monthly normals, Milford Municipal Airport (USW00023176). https://www.ncei.noaa.gov/access/us-climate-normals/#dataset=normals-monthly&timeframe=30&location=UT&station=USW00023176.

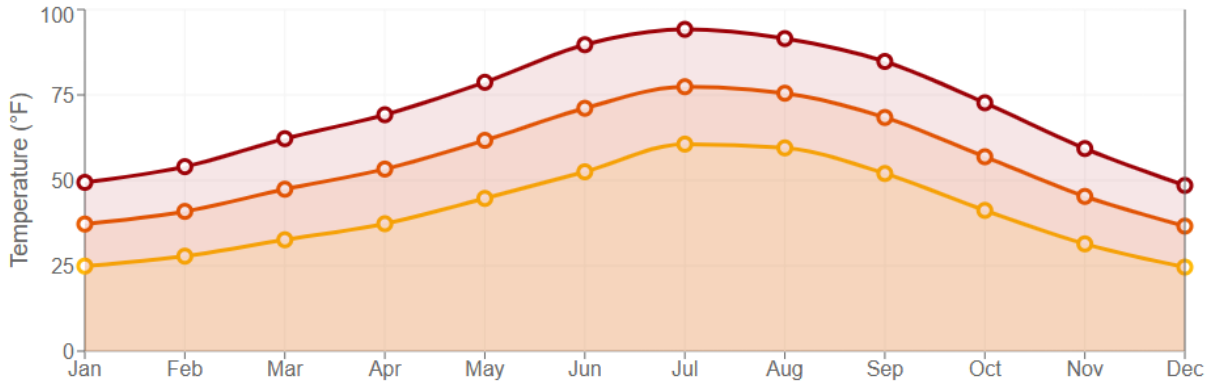


Figure 23: Average Temperature, Kanab, Utah, 1991–2020

The Cedar City Municipal Airport station (NOAA USW00093129) has a July normal maximum temperature of 91.0°F, minimum of 57.1°F, and mean of 74.0°F for 1991–2020.[43]

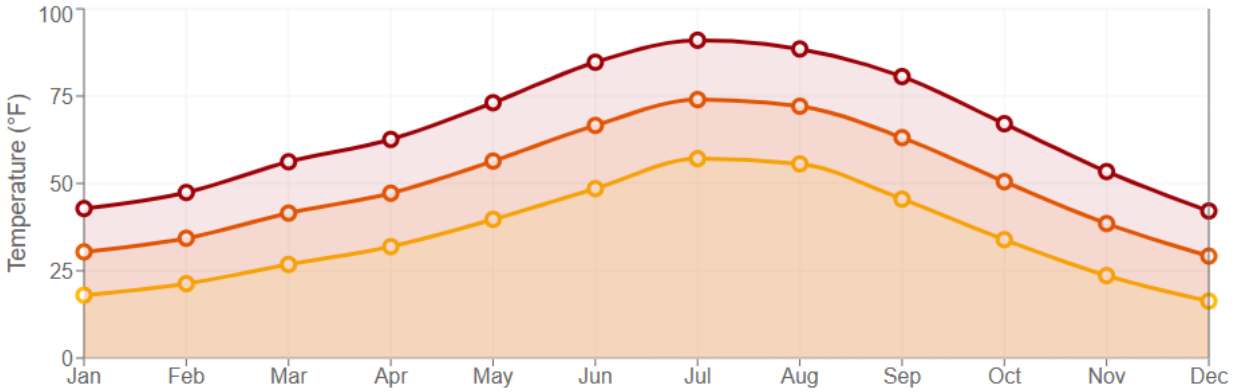


Figure 24: Average Temperature, Cedar City, Utah, 1991–2020

The July normal maximum temperature at St. George is 101.9°F, as shown in Figure 25.

[43] NOAA NCEI, 1991–2020 Monthly Climate Normals, Cedar City Municipal Airport, station USW00093129; July MLY-TMAX-NORMAL 91.0°F, MLY-TMIN-NORMAL 57.1°F, MLY-TAVG-NORMAL 74.0°F; retrieved October 10, 2026. https://www.ncei.noaa.gov/data/normals-monthly/1991-2020/access/USW00093129.csv

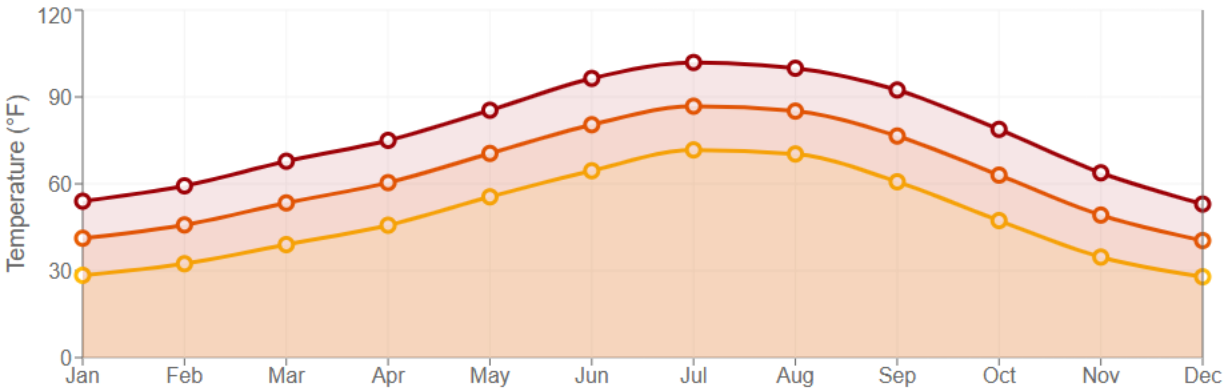


Figure 25: Average Temperature, St. George, Utah, 1991–2020

Location

Table 19 summarizes 1991–2020 July normals for selected stations. The values demonstrate that one countywide temperature does not represent all communities. For example, the listed July normal maximum temperatures for Beryl Junction and Brian Head differ by 24.4°F. Station values describe conditions at the observation site and should not be interpreted as countywide averages.

Table 19: Normal July Temperatures, 1991–2020

Station Location	County	Max Temp (°F)	Min Temp (°F)	Average Temp (°F)
Milford Municipal Airport	Beaver	95.0	59.1	77.0
Beaver Canyon Power House	Beaver	79.7	51.5	65.6
Panguitch	Garfield	86.1	46.6	66.4
Bryce Canyon National Park HQRS	Garfield	80.0	52.1	66.0
Boulder	Garfield	83.6	61.2	72.4
Escalante	Garfield	92.3	57.1	74.7
Cedar City Municipal Airport	Iron	91.0	57.1	74.0
Brian Head	Iron	68.5	42.7	55.6
Beryl Junction	Iron	92.9	50.2	71.6
Kanab	Kane	94.2	60.6	77.4
Orderville	Kane	91.0	55.3	73.2
Big Water	Kane	97.8	67.1	82.4
Paria	Kane	96.2	65.1	80.7

Station Location	County	Max Temp (°F)	Min Temp (°F)	Average Temp (°F)
St. George	Washington	101.9	71.7	86.8
La Verkin	Washington	98.3	67.6	83.0
Zion National Park	Washington	100.3	69.5	84.9
Enterprise	Washington	89.7	56.0	72.9
Veyo	Washington	92.1	63.8	77.9

The selected station normals demonstrate substantial local variation in summer temperatures; lower-elevation southern locations generally experience hotter conditions than higher-elevation locations. Heat consequences also depend on population sensitivity and access to cooling.

The CDC/ATSDR Heat and Health Index combines historical temperature, heat-related illness, and community characteristics to compare potential heat-health impacts at the ZIP-code level. Figure 26 displays the supplied 2024 rank classes, from low to high, including the top 10%. These relative ranks describe potential health impacts rather than air temperature or projected days above a threshold.[44]

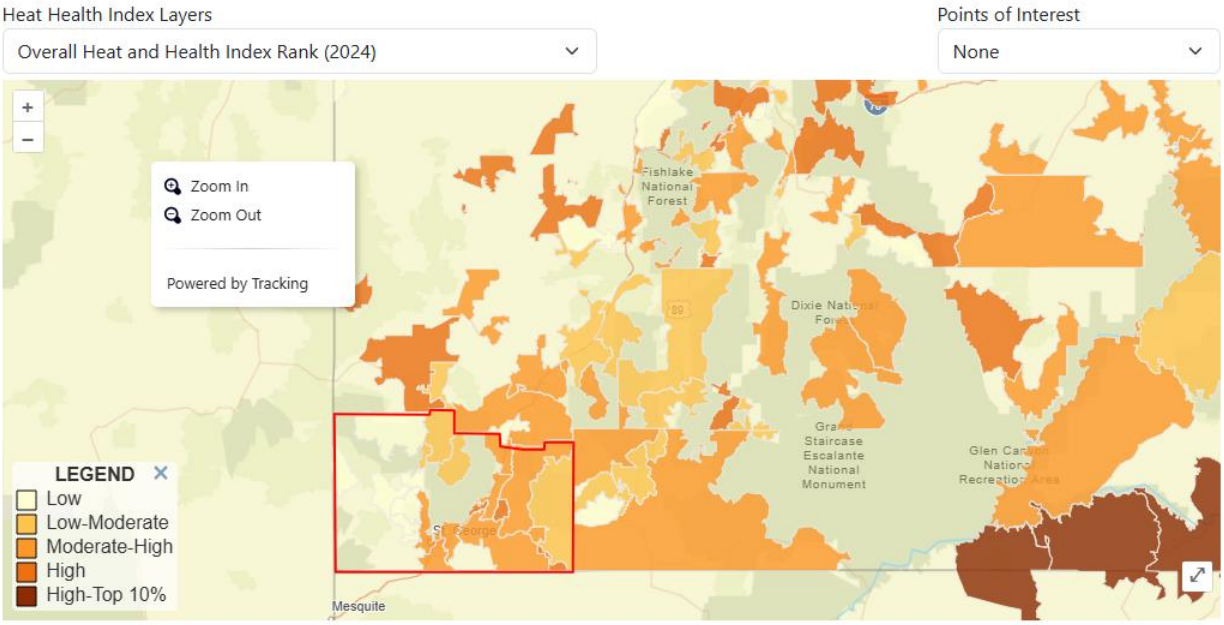


Figure 26: CDC/ATSDR Heat and Health Index Ranks, 2024 (ZIP-Code Level)

[44]Centers for Disease Control and Prevention / Agency for Toxic Substances and Disease Registry, "Heat & Health Index," September 4, 2025, https://atsdr.cdc.gov/place-health/php/hhi/index.html.

Magnitude and Extent

The NWS Heat Index estimates how hot conditions feel when air temperature and relative humidity are combined. It was developed for shady, light-wind conditions; direct sunlight can increase heat stress. Because humidity is often low in southwestern Utah, Heat Index should be used with air temperature, warm-night indicators, HeatRisk, and Wet Bulb Globe Temperature when evaluating impacts to outdoor workers, athletes, and recreation users.

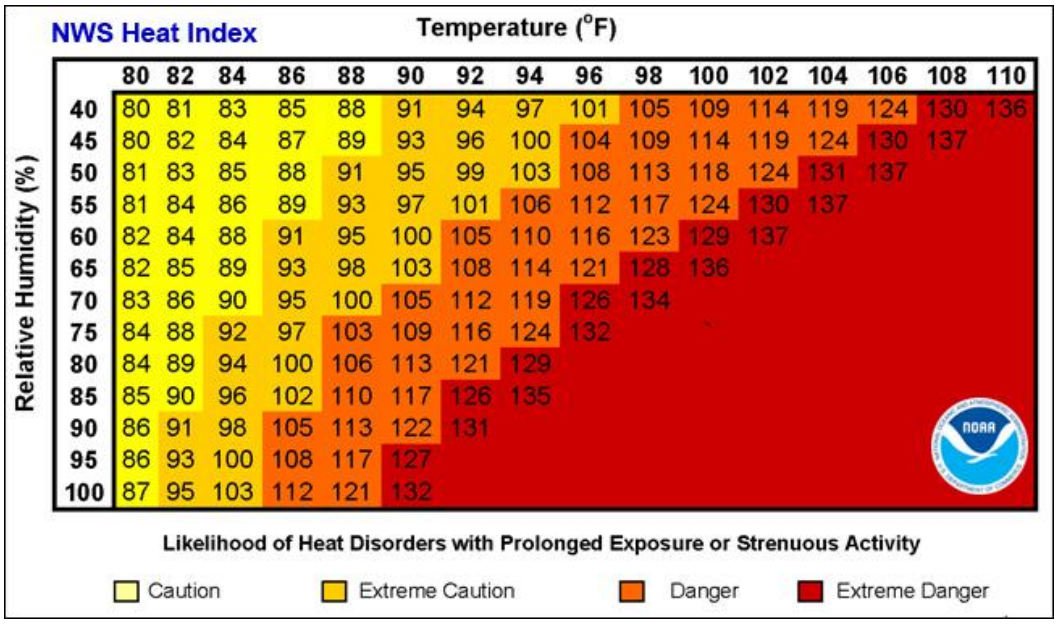


Figure 27: NWS Heat Index Scale[45]

NWS's experimental HeatRisk product provides a color and numeric forecast of the potential for heat-related impacts over a 24-hour period and identifies groups most likely to be affected. HeatRisk supplements, rather than replaces, official NWS watches, warnings, and advisories.[46]

Table 20: NWS HeatRisk Scale[47]

Category	Risk of Heat-Related Impacts
Green - 0	Little to no risk from expected heat.
Yellow - 1	Minor – Primarily affects those who are extremely sensitive to heat and without cooling/hydration.
Orange - 2	Moderate – Affects those who are sensitive to heat, especially those without cooling/hydration, and some health systems and industries.

45National Weather Service, "Heat Forecast Tools," Heat Index chart and explanation, accessed October 9, 2026, https://www.weather.gov/safety/heat-index.
46National Weather Service, Weather Prediction Center, "NWS HeatRisk Overview," accessed October 9, 2026, https://www.wpc.ncep.noaa.gov/heatrisk/overview.html. The documentation identifies HeatRisk as experimental.
47 NWS HeatRisk. https://www.wpc.ncep.noaa.gov/heatrisk/.

Category	Risk of Heat-Related Impacts
Red - 3	Major – Affects anyone without cooling/hydration as well as health systems and industries.
Magenta - 4	Extreme – Rare and/or long-duration extreme heat with no overnight relief affecting anyone without cooling/hydration as well as health systems, industries, and infrastructure.

Previous Occurrences

A search of OpenFEMA Disaster Declarations Summaries for Utah through October 10, 2026, found no federal major-disaster or emergency declaration identified specifically as heat. This finding does not establish the absence of heat events or heat as a contributing condition in declarations for other incident types; state declarations were not evaluated.[48]

On July 10, 2021, the St. George Cooperative Observer station recorded 117°F, tying Utah's official maximum-temperature record first established in St. George on July 5, 1985.[49]

The NOAA NCEI Storm Events Database documents selected excessive-heat episodes and associated impacts reported by National Weather Service forecast zones. It is not a complete inventory of every hot day or every heat-related illness or death.[50]

Table 21 lists selected verified Excessive Heat records from 2021 and 2024 within the 2021–2025 review period. They are reported by NWS forecast zone, whose boundaries may extend beyond the planning counties; the event impacts are not allocated to individual jurisdictions. Capitol Reef National Park and Vicinity and Western Canyonlands are regional forecast zones, not county boundaries.

Table 21: NCEI Storm Events Database for Excessive Heat[51]

Date	Event Type	Location	Fatalities	Injuries	Property Damage	Crop Damage
6/3/2021	Excessive Heat	Lower Washington County (Zone)	0	0	$0	$0

[48] FEMA, OpenFEMA Disaster Declarations Summaries, version 2; Utah records retrieved October 10, 2026, https://www.fema.gov/openfema-data-page/disaster-declarations-summaries-v2.
[49] NOAA NCEI, State Climate Extremes Committee Memorandum, June 27, 2022, Potential Record-tying Utah Maximum Temperature Event at St. George, UT, pp. 1–2, https://www.ncei.noaa.gov/monitoring-content/extremes/scec/reports/20220708-Utah-Maximum-Temperature.pdf.
[50] NOAA NCEI, Storm Events Database, Excessive Heat records for Utah, 2021 and 2024; details files d2021_c20260323 and d2024_c20260728, retrieved October 10, 2026, Events 968648, 968655, 968736, 968745, 968746, 968748, 968749, 968751, 1182539, and 1192724, https://www.ncei.noaa.gov/pub/data/swdi/stormevents/csvfiles/.
[51] National Centers for Environmental Information (NCEI), "Storm Events Database: Excessive Heat," 2026. https://www.ncei.noaa.gov/access/storm-events-database.

Date	Event Type	Location	Fatalities	Injuries	Property Damage	Crop Damage
6/4/2021	Excessive Heat	Glen Canyon Recreation Area/Lake Powell (Zone)	0	0	$0	$0
6/14/2021	Excessive Heat	Lower Washington County (Zone)	0	0	$0	$0
6/14/2021	Excessive Heat	Zion National Park (Zone)	0	0	$0	$0
6/14/2021	Excessive Heat	South Central Utah (Zone)	0	0	$0	$0
6/14/2021	Excessive Heat	Capitol Reef National Park and Vicinity (Zone)	0	0	$0	$0
6/14/2021	Excessive Heat	Western Canyonlands (Zone)	0	0	$0	$0
6/14/2021	Excessive Heat	Glen Canyon Recreation Area/Lake Powell (Zone)	0	0	$0	$0
7/13/2024	Excessive Heat	Lower Washington County (Zone)	1	2	$0	$0
7/21/2024	Excessive Heat	Lower Washington County (Zone)	1	0	$0	$0

Probability of Future Occurrences

Extreme heat is rated Highly Likely as a recurring summer hazard somewhere in the planning area. The rating is qualitative, supported by the 1991–2020 station normals, the documented St. George extreme, and the selected NOAA Excessive Heat episodes; it does not imply annual excessive-heat events in every jurisdiction or a calculated threshold-exceedance probability.

The plan's Highly Likely category means expected occurrence at least once per year. The Fifth National Climate Assessment identifies increasing heat risks across the Southwest, including effects on health, infrastructure, water, ecosystems, and outdoor activities.[52]

The available figures do not establish a reproducible county-specific projection of annual days above 95°F or 100°F. Quantitative threshold-day estimates are therefore omitted; future conditions are described qualitatively.

The Climate Explorer charts display temperature change from a 1961–1990 observed baseline, as labeled on their axes. That anomaly baseline differs from the 1991–2020 NOAA station normals used above.

[52] U.S. Global Change Research Program, Fifth National Climate Assessment, Chapter 28: Southwest, 2023, https://nca2023.globalchange.gov/chapter/28/.

Because the supplied exports do not establish complete scenario and geographic metadata, the charts are illustrative and are not used for county-specific quantitative conclusions.

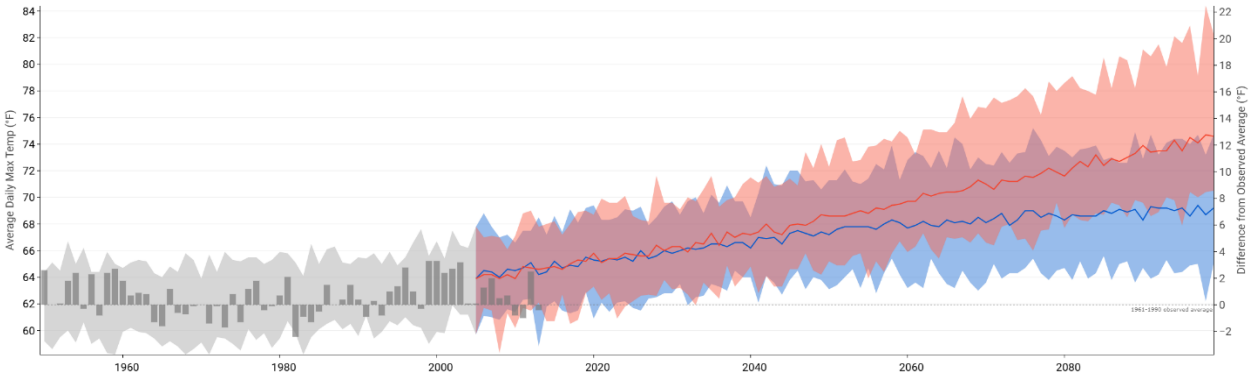


Figure 28: Climate Explorer Average Daily Maximum Temperature Change from the 1961–1990 Observed Baseline

Vulnerability Assessment

Extreme heat can affect all participating jurisdictions, but vulnerability varies substantially with elevation, typical summer temperature, nighttime cooling, land cover, housing condition, access to air conditioning, outdoor activity, and the reliability of electricity and water systems. People at elevated risk include older adults, infants and children, people with chronic medical conditions or disabilities, outdoor workers, athletes and recreation users, people experiencing homelessness, visitors unfamiliar with local conditions, and households with limited transportation or cooling access. Buildings may remain structurally intact while becoming unsafe to occupy when indoor temperatures rise. The following county assessments apply the temperature data and event information presented above without treating individual weather stations as countywide averages.

BEAVER COUNTY

Beaver County, Beaver City, Milford, and Minersville are exposed to episodes of extreme heat, although elevation and terrain produce meaningful local differences. Table 1 shows a July normal maximum of 95.0°F at Milford Municipal Airport compared with 79.7°F at Beaver Canyon Power House, illustrating why conditions at one station should not be applied uniformly. Residents without effective cooling, agricultural and construction workers, travelers, and people participating in outdoor recreation are particularly susceptible during prolonged hot periods.

Critical facilities, homes, schools, businesses, and community gathering places can experience unsafe indoor temperatures if cooling is absent or power is interrupted. Agricultural operations may face worker-safety constraints, greater livestock heat stress, and increased water demand. Transportation incidents or vehicle failures in remote areas can expose occupants to dangerous heat, while limited healthcare capacity and travel distances may delay treatment for heat illness.

Cascading impacts. Extreme heat can increase electricity demand at the same time that electrical equipment operates under added stress; an outage can then disable air conditioning, refrigeration, communications, well pumps, and electrically powered medical devices. Higher water demand can strain local supplies or distribution systems, and heat combined with dry vegetation can worsen wildfire conditions and smoke exposure. These linked effects can increase calls for emergency medical service and place additional demands on public-safety personnel.

Changes in development. New housing, commercial activity, renewable-energy facilities, transportation use, and outdoor employment can increase the number of people and assets exposed to heat, especially where development is distant from cooling centers or emergency services. Development that adds paved and roofed surfaces with limited shade can retain heat locally. Conversely, current codes, efficient cooling, backup power for critical facilities, drought-appropriate shade, and adequate water and electric capacity can reduce the vulnerability of new development.

GARFIELD COUNTY

Garfield County and the participating communities of Antimony, Boulder, Bryce Canyon City, Cannonville, Escalante, Hatch, Henrieville, Panguitch, and Tropic experience varied heat exposure because of large differences in elevation and terrain. Table 1 lists July normal maximum temperatures of 80.0°F at Bryce Canyon National Park Headquarters, 83.6°F at Boulder, 86.1°F at Panguitch, and 92.3°F at Escalante. Even in cooler high-elevation locations, unusual heat can affect people unaccustomed to high temperatures, while lower-elevation communities and canyon environments may experience greater heat stress.

Tourism and outdoor recreation increase exposure among visitors, park and hospitality workers, guides, road crews, and emergency responders. Remote travel, rugged terrain, limited shade, variable cellular coverage, and long transport times can complicate rescue and medical treatment. Homes and lodging without adequate cooling can become unsafe, and local clinics, public buildings, water systems, and visitor services may face increased demand during regional heat episodes.

Cascading impacts. Heat can coincide with drought and dry fuels, increasing wildfire potential and compounding outdoor health risks through smoke. High visitor volumes can amplify water and electricity demand, while a power interruption can disable cooling, refrigeration, communications, and pumping systems. Road closures, vehicle breakdowns, or wildfire evacuations during hot weather can leave residents and visitors exposed for longer periods and stretch law-enforcement, fire, emergency medical, and search-and-rescue resources.

Changes in development. Additional housing, lodging, visitor facilities, and recreation use can increase the exposed population, particularly in remote locations with limited utility redundancy or emergency-service access. Expansion of paved areas and buildings may create localized heat retention where shade is limited. Heat-aware site design, efficient cooling, shaded public spaces, reliable backup power and communications, and utility-capacity planning can reduce vulnerability as communities and tourism facilities develop.

IRON COUNTY

Iron County and the participating communities of Brian Head, Cedar City, Enoch, Paragonah, and Parowan have sharply different heat exposure across developed valleys and high-elevation terrain. Table 1 lists a July normal maximum of 91.0°F at Cedar City Municipal Airport, 92.9°F at Beryl Junction, and 68.5°F at Brian Head. The wide range demonstrates that vulnerability depends on local conditions; residents and visitors in cooler locations may also be less acclimated when unusually hot weather occurs.

Cedar City and nearby growing communities concentrate residents, healthcare facilities, schools, businesses, transportation corridors, and outdoor activities that can be affected by prolonged heat. Outdoor workers, university students and event attendees, older adults, children, and households without dependable cooling are susceptible. In rural and recreation areas, distance from medical care, limited shade, and delayed discovery of a person in distress may increase consequences.

Cascading impacts. Increased cooling demand can stress the electric system, and outages can quickly create unsafe conditions in residences, care settings, and public facilities. Heat can raise water demand, affect agricultural workers and livestock, worsen drought stress, and contribute to dry fuels and wildfire conditions. Wildfire smoke, road closures, or evacuations during a heat episode can further burden healthcare, emergency response, shelters, and transportation systems.

Changes in development. Continued residential and commercial growth in and around Cedar City and Enoch can increase the number of people dependent on electric cooling and can add heat-retaining roofs and pavement. New recreation, resort, industrial, and transportation-related development may also add outdoor workers and visitors. Enforcing energy and life-safety standards, preserving or adding shade, providing cooling access, and sizing electric, water, healthcare, and emergency-service capacity for peak conditions can limit added vulnerability.

KANE COUNTY

Kane County and the participating communities of Alton, Big Water, Glendale, Kanab, and Orderville face substantial but locally variable heat exposure. Table 1 lists July normal maximum temperatures of 94.2°F at Kanab, 91.0°F at Orderville, 97.8°F at Big Water, and 96.2°F at Paria. Lower-elevation desert and canyon areas can become especially hazardous, while elevation, terrain, and nighttime temperatures influence risk in other communities.

Residents, outdoor workers, visitors, and recreation users may be exposed far from shade, potable water, mobile service, or rapid medical assistance. Glen Canyon National Recreation Area and other remote destinations can place visitors in severe conditions for extended periods, and the NOAA records in Table 3 include Excessive Heat episodes for the Glen Canyon forecast zone. Homes, lodging, public facilities, and vehicles are vulnerable when cooling fails or is unavailable.

Cascading impacts. Extreme heat can combine with drought, low water availability, and dry fuels to increase pressure on water systems and worsen wildfire conditions. High recreation demand can coincide with peak electric and water use, while outages or communications failures can complicate warnings,

rescue, and sheltering. Vehicle failures, road disruptions, or emergency incidents in remote areas can lengthen exposure and require resource-intensive search, rescue, and medical transport.

Changes in development. Growth in Kanab, Big Water, and other communities, together with additional tourism facilities and recreation use, can increase exposure and seasonal demand on utilities and emergency services. Development in remote or unshaded settings may place more people far from cooling and medical care, while added pavement and roofs can increase localized heat retention. Reliable cooling, shade, backup power and communications, water planning, and clear emergency access can reduce the susceptibility of new development.

WASHINGTON COUNTY

Washington County and its participating municipalities experience the planning area's most consistently high heat exposure, although conditions still vary with elevation. Table 1 lists July normal maximum temperatures of 101.9°F at St. George, 100.3°F at Zion National Park, 98.3°F at La Verkin, 92.1°F at Veyo, and 89.7°F at Enterprise. St. George also recorded 117°F on July 10, 2021, tying Utah's official maximum-temperature record.

The county's concentration of population, older adults, visitors, construction activity, outdoor recreation, healthcare facilities, and developed property increases the number of people and systems exposed. Warm nights can limit physical recovery and keep indoor temperatures elevated. The verified 2024 Lower Washington County Excessive Heat records in Table 3 include two fatalities and two injuries across two events, demonstrating that severe consequences can occur even when reported property and crop damage is zero.

Cascading impacts. Sustained heat can produce very high electricity and water demand; a power outage can disable cooling, refrigeration, traffic controls, communications, pumps, and medical equipment. Heat can also worsen drought and wildfire conditions, while smoke or evacuation can increase demand for cooled public spaces and medical care. Heavy recreation and visitor use, transportation incidents, or search-and-rescue calls during extreme heat can compound staffing and resource demands across emergency services.

Changes in development. Continued residential, commercial, and tourism growth can increase the exposed population, cooling demand, water use, traffic, and the extent of heat-retaining roofs and pavement, particularly in the lower county. Development near recreation areas or at the urban fringe can add outdoor exposure and emergency-response needs. Compact shade networks, reflective or lower-heat materials where appropriate, efficient cooling, backup power for critical facilities, and utility and healthcare capacity matched to peak demand can reduce added vulnerability.

Flooding

Flooding is the overflow or accumulation of water on normally dry land. It can occur along rivers and streams, in mapped floodplains, at canyon mouths and alluvial fans, within ephemeral washes and slot

canyons, and where runoff exceeds drainage capacity. Flood risk is not limited to areas shown on FEMA Flood Insurance Rate Maps.

In southwestern Utah, flooding, erosion, and sedimentation can cause loss of life, damage to infrastructure, impacts to reservoirs, and degradation of natural habitats. Understanding the types of flooding that occur in the five-county region helps communities identify appropriate mitigation actions. Common flood types include the following:

- **Riverine Flooding:** Overbank flooding occurs when rivers rise and flow beyond their banks and main channels. Major river systems in the region include the Virgin, Colorado, Sevier, Paria, and Escalante Rivers.
- **Flash Flooding (Including Dry-Wash Flooding):** Rapid flooding in a normally dry area or a quick rise of water in a stream or wash, typically developing within hours of intense rainfall. In southwestern Utah, summer monsoon storms can generate fast-moving flows in washes, slot canyons, and canyons.
- **Post-Wildfire Flooding and Debris Flows:** Wildfire can remove vegetation and alter soil properties, increasing runoff, erosion, sediment transport, and debris-flow potential during subsequent rainfall. Flooding and debris flows are related but distinct processes; post-fire assessments distinguish their locations and potential effects.
- **Ice and Debris Jams:** Flooding occurs when ice or debris blocks a channel and causes water to back up and spill into surrounding areas, sometimes compounding ongoing flooding by restricting flow at bridges, culverts, or narrow channel sections.
- **Snowmelt (and Rain-On-Snow) Flooding:** Flooding that occurs when warming temperatures rapidly melt snowpack (often on already saturated ground), increasing runoff into creeks and rivers and potentially causing overbank flooding.
- **Dam or Levee Incident or Failure:** Overtopping, excessive seepage, operational releases, or structural failure can release water downstream. Dam failure is profiled separately in this plan; this flood profile addresses resulting inundation only as a cascading or related mechanism.

This profile focuses on the flood mechanisms most relevant to the Five County AOG region: riverine flooding along perennial rivers and streams, flash flooding in ephemeral washes and slot canyons, and post-wildfire flooding and debris flows in burn-scarred watersheds.

Flood characteristics and impacts vary by setting. Riverine floods can inundate floodplains for hours to days, with depth and duration influenced by watershed size, antecedent moisture, snowmelt, and rain-on-snow conditions. Flash floods develop rapidly (often from short-duration, high-intensity rainfall) and can be high-velocity and debris-laden, damaging roads, culverts, channels, and structures. In burn-scarred watersheds, vegetation loss and soil changes can increase peak flows and sediment loads, raising the likelihood of debris flows, channel aggradation, and clogged drainage infrastructure.

Southern Utah experiences recurring flash flooding from short-duration, high-intensity storms, including warm-season convective and monsoonal storms. Moisture sources and storm tracks vary by event; the

combination of intense rainfall, steep terrain, exposed rock, narrow canyons, and ephemeral drainage networks can produce rapid runoff and little warning.

Flash flooding can erode channels, transport sediment and debris, damage or block roads, inundate structures, and isolate communities. Outdoor recreation users in slot canyons, washes, and remote terrain are particularly susceptible because flooding may develop rapidly upstream of the affected location.

Location

Flooding in the Five County AOG planning area (Beaver, Garfield, Iron, Kane, and Washington Counties) occurs in and near river corridors, canyon mouths, alluvial fans, and ephemeral washes that can remain dry for long periods. Flash flooding can also occur across small, steep basins during short-duration, high-intensity storms and in burn-scarred watersheds following wildfires.

Mapped 1% annual chance floodplains (Special Flood Hazard Areas, or SFHAs) shown on FEMA Flood Insurance Rate Maps (FIRMs) identify many riverine-risk areas and support local floodplain management and National Flood Insurance Program (NFIP) administration. Because much of the region's damaging flooding is driven by localized convective storms, flood impacts may also occur outside mapped SFHAs, particularly along washes, in slot canyons, and downstream of recent burn areas. Reliance on mapped floodplains alone may underestimate risk in areas subject to localized storm-driven flooding.[53]

Overall, flood risk in southwestern Utah is concentrated along the Virgin River system and other major drainages, as well as in normally dry washes where runoff can rapidly concentrate. In Washington County, the three largest flooding sources, the Virgin River, Santa Clara River, and Fort Pearce Wash, converge in the St. George area near the I-15 corridor, creating a focal point for riverine inundation, wash flows, and stormwater system exceedance during major events. Across Beaver, Garfield, Iron, Kane, and Washington Counties, this same pattern repeats at canyon mouths, alluvial fans, and ephemeral wash networks where steep terrain and short-duration, high-intensity storms can produce fast-moving flows and debris-laden flooding, including downstream of recent burn areas. This location context is used in the following section to describe the magnitude and consequences of flooding across the planning area.

Magnitude and Extent

Flood severity is described using likelihood and intensity. A 1%-annual-chance flood has a 1% chance of being equaled or exceeded in any year; a 0.2%-annual-chance flood has a 0.2% annual chance. These probabilities do not establish a schedule, and multiple events can occur within the nominal return period. Assuming independent annual probabilities, the chance of one or more 1%-annual-chance events during 30 years is approximately 26%.

[53] FEMA, Flood Maps; National Weather Service, Flood Related Hazards (flash flooding, dry washes, and post-fire conditions). https://www.fema.gov/flood-maps ; https://www.weather.gov/safety/flood-hazards.

For planning purposes, the 1%-annual-chance flood provides a consistent benchmark through FEMA FIRMs, Flood Insurance Studies, and Special Flood Hazard Areas. The profile also considers flash flooding, alluvial-fan flooding, drainage exceedance, and post-wildfire runoff that may occur outside mapped Special Flood Hazard Areas.

Extent also considers the range of anticipated flood intensities that may occur in the planning area (e.g., depth, velocity, duration, and debris and sediment load). In southwestern Utah, intensity can range from shallow overland flooding and ponding when stormwater systems are exceeded, to deep and sustained riverine inundation along major channels, to high-velocity, debris-laden flash flooding in washes, slot canyons, and canyon mouths, especially downstream of burn scars.

BEAVER COUNTY

Available FEMA mapping and the county's physical setting indicate that Beaver County's flood hazard is concentrated primarily along discrete river and creek corridors, agricultural bottoms, alluvial channels, normally dry washes, and roadway crossings rather than across broad, contiguous portions of the county. Flood magnitude can nevertheless be substantial at affected locations: rapid snowmelt, rain-on-snow conditions, or short-duration high-intensity rainfall can produce overbank flow, erosion, sediment transport, culvert overtopping, and temporary loss of access, while recently burned slopes in the eastern mountain watersheds can increase runoff and debris-flow potential. Mapped and documented flood-prone areas are generally narrow and dispersed, and a single event would be expected to affect a relatively small share of the county, although local depths and velocities may be damaging.

GARFIELD COUNTY

Garfield County's flood hazard is dominated by high-velocity flash flooding in steep tributaries, narrow canyons, slot canyons, and washes associated with the Sevier, Escalante, and Colorado River drainage systems, with additional exposure at roadway crossings, developed canyon mouths, low-lying valley areas, and watersheds affected by wildfire. Individual inundation areas are commonly narrow, but flood magnitude can be severe where confined topography rapidly concentrates runoff and entrained sediment, leaving little warning and threatening transportation routes, recreation areas, utilities, and isolated communities. During broad monsoonal or frontal storm systems, intense rainfall may affect multiple drainage basins during the same operational period, expanding consequences beyond one channel even though much of the county remains outside the active flood footprint. The countywide distribution of susceptible drainages, canyon environments, and post-fire watersheds supports the potential for severe localized flooding and concurrent impacts across multiple basins.

IRON COUNTY

Iron County is subject to riverine, drainage, and flash flooding generated by snowmelt, intense convective rainfall, and post-wildfire runoff, with exposure concentrated along channels and washes, at canyon mouths and alluvial fans, and across developed valley floors near Cedar City, Enoch, Parowan, and other communities. The county's effective regulatory mapping is based largely on older studies, while

preliminary studies and the ongoing 2022–2028 county mapping project provide improved hydrologic and topographic information; accordingly, mapped Special Flood Hazard Areas alone may not depict the full planning-scale footprint. Recent events illustrate the potential magnitude of localized flooding: July–August 2021 storms repeatedly affected Enoch, Cedar City, and the Parowan area, with reported residential flooding, road inundation, erosion, and substantial property losses.

KANE COUNTY

Kane County's flood magnitude is driven principally by rapid-onset flash flooding in steep watersheds, slot canyons, confined channels, and normally dry washes, together with riverine and drainage flooding along the Virgin and Paria systems and other tributaries. Intense localized rainfall can produce abrupt rises, high velocities, channel erosion, and debris-laden flows that threaten low-water crossings, state and local roads, utilities, developed drainage outlets, and heavily visited recreation areas; post-wildfire runoff can further increase peak flow and sediment loads. Although an individual event's inundation footprint is typically confined to drainage corridors, the county contains an extensive network of susceptible canyons and washes, and a widespread storm can generate concurrent incidents across separate basins, as demonstrated by recurring damaging and fatal flash floods in southern Kane County and canyon settings.

WASHINGTON COUNTY

Washington County has the region's greatest documented flood consequences and the broadest intersection of flood-prone waterways with developed areas. The Virgin and Santa Clara Rivers, Fort Pearce Wash, and numerous tributary and urban wash systems cross or converge near the county's principal population centers, transportation corridors, utilities, and other community lifelines; intense rainfall, rain-on-snow conditions, or post-fire runoff can therefore produce deep riverine inundation, high-velocity wash flows, erosion, sediment deposition, and drainage-system exceedance across multiple jurisdictions during the same event. FEMA-supported Risk MAP work in the Upper Virgin, Fort Pearce, and Escalante Desert watersheds has evaluated numerous stream reaches, and state project documentation reports more than 60 damaging flood events from 1996 through 2020, including seven events exceeding $1 million in losses and 25 fatalities. This distributed network of studied rivers and washes, the concentration of people and assets along those corridors, and the potential for multi-community impacts indicate that Washington County can experience extensive and high-consequence flooding during major events.

Previous Occurrences

Southwestern Utah has experienced damaging riverine floods, flash floods, post-wildfire runoff, and debris flows. Historical records demonstrate repeated transportation disruption, infrastructure damage, erosion, isolation, and life-safety consequences. In more recent decades, southwestern Utah has experienced some of the most damaging floods in the state, including the January 2005 floods in Washington County, which caused hundreds of millions of dollars in damage and overwhelmed rivers and stormwater systems across the St. George area. Flooding associated with short-duration, high-intensity

storms has repeatedly closed state highways (such as SR-9, SR-12, SR-14, and SR-143), isolated rural communities, and caused fatalities, especially in canyons and burn-scarred landscapes. Post-wildfire flooding and debris flows, notably following the 2017 Brian Head Fire, have further amplified flood risk by increasing runoff and sediment transport. Overall, historical flooding in southwestern Utah reflects a pattern of frequent flash floods with episodic high-consequence events, reinforcing the region's ongoing need for floodplain management, warning systems, and infrastructure adaptation planning.

January 2005: Rain falling on snow contributed to major flooding in southern Utah, including Washington and Kane Counties. High flows and erosion affected the Virgin and Santa Clara River corridors, damaging homes, roads, bridges, utilities, and agricultural lands.

Table 22: Previous Federal Flood-Related Disaster Declarations[54]

Year	Declaration Number	Event Description	Planning-Area Counties Designated
1983	DR-680-UT	Severe storms, landslides, and flooding; declared April 30, 1983.	Beaver, Garfield
1984	DR-720-UT	Severe storms, mudslides, landslides, and flooding; declared August 17, 1984.	None of the five planning-area counties designated.
2005	DR-1576-UT	Severe storms and flooding; incident period January 8–12, 2005; declared February 1, 2005.	Kane, Washington
2005	DR-1598-UT	Flood and landslide; incident period April 28–June 29, 2005. This declaration is separate from the January 2005 floods.	Beaver, Iron, Kane
2011	DR-1955-UT	Severe winter storm and flooding; incident period December 20–24, 2010; declared February 11, 2011.	Garfield, Kane, Washington
2011	DR-4011-UT	Flooding; incident period April 18–July 16, 2011; declared August 8, 2011.	Beaver
2012	DR-4053-UT	Severe storm, November 30–December 1, 2011; declared February 1, 2012. Included for statewide context.	None of the five planning-area counties designated.

54 FEMA, OpenFEMA Disaster Declarations Summaries, version 2; Utah records retrieved October 10, 2026. https://www.fema.gov/openfema-data-page/disaster-declarations-summaries-v2 Table years are declaration years; designated counties reflect FEMA records, not a complete inventory of physical impacts.

Year	Declaration Number	Event Description	Planning-Area Counties Designated
2012	DR-4088-UT	Severe storm and flooding on September 11, 2012; declared November 3, 2012.	Washington

September 14, 2015: Strong thunderstorms produced deadly flash flooding in Hildale and Zion National Park. NOAA records distinguish 20 fatalities in Utah from the combined events and one additional fatality in Arizona. Thirteen people died near Hildale and seven died in Keyhole Canyon in Zion National Park.

2017, Brian Head area: Brian Head Town's May 2025 newsletter documents that flooding destroyed the 5-Mile Picnic Area near Yankee Meadows in 2017.

The National Centers for Environmental Information (NCEI) provides historical data on severe storms and their related or cascading hazards in designated locations. Table 23 provides specific data for Flood and Flash Flood events that caused $100,000 or greater in damage from 2021 to 2025 in the Five County AOG planning area.

Table 23: NCEI Storm Events Database Flood and Flash Flood Events $100,000 and Greater for 2021–2025[55]

Date	Event Type	Location	Fatalities	Injuries	Property Damage	Crop Damage
7/14/2021	Flash Flood	Enoch	0	0	$270,000	$0
7/14/2021	Flood	St. George	0	0	$100,000	$0
7/15/2021	Flash Flood	Lund	0	3	$1,000,000	$0
7/25/2021	Flash Flood	Parowan Arpt	0	0	$100,000	$0
7/25/2021	Flash Flood	Parowan Arpt	0	0	$300,000	$0
7/31/2021	Flash Flood	Enoch	0	0	$300,000	$0
8/1/2021	Flash Flood	Enoch	0	0	$9,000,000	$0
8/18/2021	Flash Flood	Cedar City	0	0	$200,000	$0

[55] National Centers for Environmental Information (NCEI), "Storm Events Database: Flood and Flash Flood," 2026, https://www.ncei.noaa.gov/access/storm-events-database.

Date	Event Type	Location	Fatalities	Injuries	Property Damage	Crop Damage
8/17/2023	Flash Flood	(CDC)Cedar City Arpt	0	0	$1,000,000	$0
10/10/2025	Flash Flood	Pine Valley	0	0	$125,000	$0

RECENT EVENTS

August 1, 2021, Enoch: A severe rainstorm caused substantial residential flooding and led the city to issue a local emergency declaration.

July 26, 2021, Cedar City: NOAA event 974481 documents flash flooding across roads, including Interstate 15 near milepost 59. The record reports $0 in property damage, so it is not included in Table 2's selected high-damage events.[56]

Probability of Future Occurrences

Flooding is rated Likely under the Five County AOG probability methodology because damaging flood and flash-flood events recur within the planning area, but the available record does not support an annualized probability for every jurisdiction or location. This regional rating is distinct from the 1% annual chance assigned to a mapped floodplain location.

FEMA flood-hazard probabilities describe the likelihood of flooding at mapped locations and should not be used as the sole basis for a regionwide occurrence rating. Flash flooding, drainage exceedance, and post-wildfire runoff may occur outside mapped floodplains.

Future flood risk may change through both hazard and exposure pathways. More intense precipitation can increase runoff and drainage exceedance, while wildfire can increase post-fire erosion and debris-flow potential. Growth and development can add exposed people and assets or alter runoff where drainage, floodplain, and low-impact-development measures are insufficient. The direction and magnitude of change vary by watershed and storm type.

The plan uses the following probability categories:

- **Highly Likely:** Expected to occur at least once per year, based on the source and period of record identified in the applicable hazard profile.
- **Likely:** Expected to occur more than once in 10 years but less than annually, based on the source and period of record identified in the applicable hazard profile.

[56] NOAA NCEI Storm Events Database, Utah Flash Flood event 974481, July 26, 2021; details file d2021_c20260323, retrieved October 10, 2026. https://www.ncei.noaa.gov/pub/data/swdi/stormevents/csvfiles/.

- **Occasional:** Expected to occur approximately once in 10 to 100 years, based on the source and period of record identified in the applicable hazard profile.
- **Unlikely:** Expected to occur less often than once in 100 years, or available information is insufficient to support a higher category.

Mapped 1%- and 0.2%-annual-chance flood zones describe flood likelihood at particular locations, not the annual probability of a damaging flood somewhere in the planning area. The regional Likely rating reflects recurring documented Flood and Flash Flood events rather than mapped return periods alone.[57]

Collectively, the documented history of intermittent but impactful floods supports a probability classification of **Likely**, reflecting a hazard that must be planned for regularly but does not affect the region uniformly from year to year. This classification is further supported by the frequency of recent flood and flash flood events documented in the NOAA Storm Events Database.

Vulnerability Assessment

Flood vulnerability varies by flood mechanism, depth, velocity, duration, warning time, sediment and debris load, erosion potential, building characteristics, access, and the location and redundancy of community lifelines. Across the five-county region, exposure is concentrated in mapped and unmapped drainage paths, river and creek corridors, low areas, canyon mouths, alluvial fans, stormwater-constrained developed areas, recreation settings, and watersheds affected by wildfire. The county assessments below are qualitative and identify the people, structures, infrastructure, economic activities, and natural or cultural resources most susceptible to flooding; they do not establish that every asset or municipal area lies within a mapped floodplain.

BEAVER COUNTY

Beaver County and its participating municipalities—Beaver City, Milford, and Minersville—are vulnerable where people and development intersect river and creek corridors, agricultural bottoms, alluvial channels, normally dry washes, and roadway crossings. Flooding may result from rapid snowmelt, rain-on-snow conditions, short-duration high-intensity rainfall, or runoff from recently burned mountain watersheds. Although exposed areas are generally narrow and dispersed, localized water depth, velocity, erosion, and debris can create serious life-safety and property consequences.

Homes, businesses, public buildings, agricultural facilities, and other structures in low-lying areas or near channels may experience inundation, foundation undermining, sediment deposition, and damage to electrical, plumbing, and mechanical systems. Residents and travelers may be exposed at low-water

[57] FEMA, Guidance for Flood Risk Analysis and Mapping: Riverine Mapping and Floodplain Boundaries, November 2024. Special Flood Hazard Areas use the 1%-annual-chance flood; moderate-hazard areas include the area between the 1% and 0.2% floodplain boundaries. https://www.fema.gov/sites/default/files/documents/fema_guidance_riverine_mapping_and_floodplain_boundaries_nov2024.pdf.

crossings or on roads that follow or cross drainages, and rural or dispersed communities may have limited alternate access when a bridge, culvert, or road is closed.

Roads, bridges, culverts, water and wastewater systems, power and communications facilities, and emergency-service access are important sources of vulnerability. Flood-related closures can interrupt agricultural activity, commerce, public services, and travel between communities. Riparian areas, agricultural soils, recreation sites, and historic or cultural resources near waterways may be eroded, buried by sediment, or temporarily inaccessible.

Cascading impacts: Flooding can accelerate channel erosion, slope instability, landslides, and debris flows, particularly on steep, saturated, or recently burned slopes. Sediment and woody debris can block culverts and bridges, redirect flows, and damage downstream roads or utilities. Loss of transportation or communications links can isolate communities, delay emergency response, and interrupt water, wastewater, and power service.

Changes in development: New homes, businesses, roads, and utilities placed in or near floodplains, washes, alluvial channels, or drainage crossings can increase the number and value of exposed assets and may alter runoff if drainage capacity is insufficient. Conversely, floodplain avoidance, preserved conveyance areas, properly sized culverts and detention, elevation or floodproofing, and site-scale runoff controls can limit additional vulnerability. Available regional materials do not establish participant-specific changes in flood-prone development since the prior plan; absence of those records is not a finding of no change.

GARFIELD COUNTY

Garfield County and its participating municipalities—Antimony, Boulder, Bryce Canyon City, Cannonville, Escalante, Hatch, Henrieville, Panguitch, and Tropic—are vulnerable to high-velocity flash flooding in steep tributaries, narrow canyons, slot canyons, washes, developed canyon mouths, and low-lying areas associated with the Sevier, Escalante, and Colorado River drainage systems. Intense rainfall can rapidly concentrate runoff and debris with little warning, while wildfire-affected watersheds can produce increased runoff and sediment. Visitors unfamiliar with local conditions may be especially exposed in canyons and normally dry channels.

Residential, commercial, lodging, public, and agricultural structures near drainages or on low ground may be damaged by inundation, erosion, sediment deposition, and debris impact. The county's dispersed settlement pattern and extensive public lands increase reliance on a limited road network; flooding at crossings or through confined corridors may isolate communities, strand recreation users, and restrict access to emergency services.

State and local roads, bridges, culverts, utilities, communications systems, and visitor-serving facilities are particularly important to community function and the tourism economy. Closures affecting recreation areas, scenic routes, parks, trails, or community gateways can cause business interruption beyond the immediate flood footprint. Riparian habitat, park lands, historic resources, and cultural sites near channels may be altered by erosion, channel migration, and sediment or debris deposition.

Cascading impacts: Flooding can trigger rockfall, landslides, bank failure, and debris flows on steep or fire-affected slopes. Sediment and woody debris may plug drainage structures, overtop roads, redirect water into developed areas, and damage downstream water or wastewater facilities. Concurrent incidents in separate basins can stretch search-and-rescue capacity, close multiple access routes, and disrupt tourism and supply movement across the county.

Changes in development: Additional development at canyon mouths, along valley bottoms, near washes, or beside constrained transportation corridors can increase exposure and place more demand on drainage and emergency-access systems. Growth in visitor facilities and recreation use can also increase the number of people present in flash-flood settings. Avoidance of active channels, preservation of natural conveyance, drainage improvements, flood-resistant design, warning systems, and redundant access can reduce added vulnerability. Available regional materials do not establish participant-specific changes in flood-prone development since the prior plan.

IRON COUNTY

Iron County and its participating municipalities—Brian Head, Cedar City, Enoch, Paragonah, and Parowan—are vulnerable to riverine, drainage, and flash flooding along channels and washes, at canyon mouths and alluvial fans, and across developed valley floors. Snowmelt, intense convective rainfall, and post-wildfire runoff can produce rapid surface flow, ponding, erosion, and debris-laden flooding. The July–August 2021 events in Enoch, Cedar City, and the Parowan area demonstrate that repeated storms can affect homes, roads, and multiple communities within a short period.

Homes, businesses, public buildings, and other structures may be exposed where development occupies low-lying areas, drainage paths, alluvial fans, or locations where stormwater capacity can be exceeded. Floodwater can damage contents and building systems, erode supporting soils, and deposit sediment. Residents may be displaced, and people traveling through flooded roadways or recreating in canyons and mountain drainages may face fast-moving water with limited warning.

Roads, Interstate 15 connections, bridges, culverts, drainage facilities, water and wastewater systems, power, communications, schools, and emergency facilities are central to countywide vulnerability. Damage or closure can delay response and interrupt services across a larger area than the inundation footprint. Business interruption, cleanup costs, and reduced access to recreation and tourism destinations can compound direct property losses; natural and cultural resources may also be affected by erosion and sedimentation.

Cascading impacts: Flooding can mobilize sediment and debris, undermine roads and utilities, destabilize slopes, and initiate debris flows or landslides, especially below burn scars such as those in the Brian Head area. Blocked culverts or channels can redirect water into neighborhoods or across transportation corridors. Infrastructure damage can interrupt water, wastewater, power, and communications service and can isolate communities or delay emergency response.

Changes in development: Continued growth on valley floors and near washes, drainage corridors, canyon outlets, and alluvial fans can increase exposed population and property and can increase runoff

where impervious cover is added without adequate detention or conveyance. Up-to-date mapping, preserved drainage corridors, site-specific hydrologic review, properly designed stormwater systems, elevation or floodproofing, and redundant access can limit added risk. Available materials identify improved mapping efforts but do not establish participant-specific changes in flood-prone development since the prior plan.

KANE COUNTY

Kane County and its participating municipalities—Alton, Big Water, Glendale, Kanab, and Orderville—are vulnerable to rapid-onset flash flooding in steep watersheds, slot canyons, confined channels, and normally dry washes, as well as riverine and drainage flooding along the Virgin and Paria systems and other tributaries. Intense localized rainfall can generate abrupt rises, high velocities, erosion, and debris-laden flow. Residents, motorists, and the large number of recreation users in canyon settings may have little warning and limited escape options.

Homes, businesses, public buildings, visitor facilities, and other structures near washes, drainage outlets, river corridors, and canyon mouths may experience inundation, foundation erosion, debris impact, and sediment deposition. Rural and dispersed communities can be especially vulnerable when a single road or low-water crossing provides primary access. Flash flooding can also strand visitors in remote locations and create extensive search-and-rescue demands.

State and local roads, bridges, culverts, utilities, communications, water and wastewater systems, and recreation infrastructure support both residents and the visitor economy. Damage or closures may interrupt emergency access, commerce, park and recreation activity, and travel between communities. Riparian corridors, park lands, historic properties, and cultural resources near channels may be eroded, buried, or made inaccessible.

Cascading impacts: Flooding can trigger bank failure, rockfall, landslides, and debris flows and can move sediment or woody debris into culverts, bridges, and channels. Obstructions may back up or redirect water, damage roads and utilities, and create additional downstream hazards. Simultaneous incidents in separate canyons or basins can strain warning, rescue, transportation, and communications resources and prolong isolation of affected areas.

Changes in development: Development near washes, canyon mouths, river corridors, low-water crossings, or constrained drainage outlets can increase exposure and place more people in rapid-onset flood settings. Increased recreation use can similarly increase transient exposure even without permanent construction. Floodplain and wash avoidance, protected conveyance, drainage improvements, warning and closure procedures, flood-resistant design, and redundant access can reduce added vulnerability. Available regional materials do not establish participant-specific changes in flood-prone development since the prior plan.

WASHINGTON COUNTY

Washington County and its participating municipalities—Apple Valley, Enterprise, Hildale, Hurricane, Ivins, La Verkin, Leeds, New Harmony, Rockville, Santa Clara, Springdale, St. George, Toquerville, Virgin, and Washington City—have the region's broadest intersection of flood-prone waterways with developed areas. The Virgin and Santa Clara Rivers, Fort Pearce Wash, and numerous tributary and urban wash systems cross or converge near population centers, transportation corridors, utilities, and recreation destinations. Riverine flooding, high-velocity wash flow, drainage-system exceedance, and post-fire runoff can affect multiple jurisdictions during the same event.

Residents, visitors, homes, businesses, public buildings, and community facilities are vulnerable in river corridors, washes, low areas, canyon outlets, and locations where drainage capacity is exceeded. The January 2005 floods and the fatal September 2015 flash floods demonstrate both major property consequences and severe life-safety risk in developed river corridors, normally dry channels, and confined recreation settings. Flooding can displace households, damage building systems and foundations, and restrict access to emergency services.

Interstate and local transportation routes, bridges, culverts, stormwater systems, water and wastewater facilities, power, communications, schools, public-safety facilities, and other community lifelines face direct damage and loss-of-access risk. Because the county's economy depends heavily on tourism, recreation, construction, and interconnected urban services, closures or utility disruptions can cause losses well beyond the flooded area. Riparian habitat, parks, trails, historic resources, and cultural sites may be altered by erosion, channel migration, sediment, and debris.

Cascading impacts: Flooding can erode banks and slopes, trigger debris flows or landslides, and mobilize sediment and woody debris that obstruct bridges, culverts, and urban drainage systems. Redirected flow can expand inundation into developed areas, while damage to roads, utilities, and communications can delay emergency response and interrupt regional services. Concurrent impacts along the Virgin River system, Santa Clara River, Fort Pearce Wash, and tributary washes can compound evacuation, sheltering, transportation, public-health, and economic consequences.

Changes in development: Continued population and economic growth can increase the number and value of assets near rivers and washes and can increase runoff where impervious surfaces expand without adequate stormwater controls. Redevelopment and new construction can reduce vulnerability when they avoid floodways and active washes, preserve conveyance, incorporate detention and low-impact-development practices, elevate or floodproof structures, and maintain redundant access. Available regional materials do not establish participant-specific changes in flood-prone development since the prior plan, so the direction and magnitude of development-related change should be confirmed through local permitting, mapping, and capital-improvement records.

National Flood Insurance Program (NFIP) Participation

The NFIP provides federally backed flood insurance in participating communities and requires adoption and enforcement of minimum floodplain-management standards. Table 3 summarizes each jurisdiction's reported NFIP participation status, community identification number, program date, map information, Community Rating System class, policies in force, coverage, claims, and repetitive-loss entries.

Repetitive-loss properties are NFIP-insured properties that have experienced repeated flood losses, while severe-repetitive-loss properties meet higher statutory thresholds for the number and value of claims. The repetitive-loss column in Table 3 identifies the reported entries available for the listed jurisdictions and should be considered together with local flood histories, claims experience, and current FEMA records when prioritizing mitigation activities.

Table 24: NFIP Jurisdictional Inventory[58]

Jurisdiction	NFIP Participation / Community ID / Program Date	Map / CRS Class	Policy Count	Coverage	Claims	Repetitive Loss
Beaver County	Participating Community ID: 490001 Program date: 09/18/87	(All Zone D) CRS Class: Not listed	-	-	0	-
Beaver City	Non-participating Community ID: 490002	04/01/77 CRS Class: Not listed	-	-	-	-
Milford	Participating Community ID: 490003 Program date: 02/02/84	(NSFHA) CRS Class: Not listed	-	-	-	-
Minersville	Not listed in supplied Community Status Book	Not listed in supplied Community Status Book	-	-	-	-
Garfield County	Participating Community ID:	08/05/86(M) CRS Class: Not listed	22	$3,648,000	2	0

[58] Source: community-status and policy/claims inventory reproduced in the supplied plan component. The extract date, policy/claims source, and as-of dates are not recorded and could not be independently verified. Values are retained only as an undated planning inventory, not current counts. Blank cells indicate unavailable data, not zero; "not listed" does not establish nonparticipation. Repetitive-loss entries do not provide property types or severe-repetitive-loss counts.

Jurisdiction	NFIP Participation / Community ID / Program Date	Map / CRS Class	Policy Count	Coverage	Claims	Repetitive Loss
	490065 Program date: 08/05/86					
Antimony	Non-participating Community ID: 490066	04/02/76 CRS Class: Not listed	-	-	-	-
Boulder	Not listed in supplied Community Status Book	Not listed in supplied Community Status Book	-	-	-	-
Bryce Canyon City	Not listed in supplied Community Status Book	Not listed in supplied Community Status Book	-	-	-	-
Cannonville	Not listed in supplied Community Status Book	Not listed in supplied Community Status Book	-	-	-	-
Escalante	Participating Community ID: 490067 Program date: 08/28/79	08/28/79(M) CRS Class: Not listed	-	-	-	-
Hatch	Participating Community ID: 490068 Program date: 07/24/79	07/24/79(M) CRS Class: Not listed	1	$250,000	-	-
Henrieville	Participating Community ID: 490069 Program date: 09/25/79	09/28/79(M) CRS Class: Not listed	-	-	-	-
Panguitch	Participating Community ID: 490070 Program date: 08/28/79	08/28/79(M) CRS Class: Not listed	6	$1,288,000	-	-
Tropic	Participating Community ID:	12/04/79(M) CRS Class: Not listed	1	$252,000	-	-

Jurisdiction	NFIP Participation / Community ID / Program Date	Map / CRS Class	Policy Count	Coverage	Claims	Repetitive Loss
	490071 Program date: 12/04/79					
Iron County	Participating Community ID: 490073 Program date: 07/17/86	07/17/86(M) CRS Class: Not listed	55	$25,939,000	11	2
Brian Head	Not listed in supplied Community Status Book	Not listed in supplied Community Status Book	-	-	-	-
Cedar City	Participating Community ID: 490074 Program date: 10/16/84	10/16/84 CRS Class: 10	15	$10,939,000	4	-
Enoch	Participating Community ID: 490035 Program date: 11/01/21(E)	No currently effective map date listed CRS Class: Not listed	-	-	-	-
Kanarraville	Participating Community ID: 490077 Program date: 12/11/85	(NSFHA) CRS Class: Not listed	1	$350,000	0	-
Paragonah	Participating Community ID: 490075 Program date: 09/24/84	06/02/05 CRS Class: Not listed	2	$618,000	0	-
Parowan	Participating Community ID: 490076 Program date: 03/18/86	03/18/86(M) CRS Class: Not listed	3	$2,195,000	1	-
Kane County	Participating Community ID: 490083 Program date: 07/01/86	07/01/86(L) CRS Class: Not listed	18	$5,619,000	5	0

Jurisdiction	NFIP Participation / Community ID / Program Date	Map / CRS Class	Policy Count	Coverage	Claims	Repetitive Loss
Alton	Participating Community ID: 490243 Program date: 07/10/85	(NSFHA) CRS Class: Not listed	-	-	-	-
Big Water	Not listed in supplied Community Status Book	Not listed in supplied Community Status Book	-	-	-	-
Glendale	Participating Community ID: 490084 Program date: 05/01/86	05/01/86(L) CRS Class: Not listed	3	$562,000	0	-
Kanab	Participating Community ID: 490085 Program date: 08/19/85	08/19/85(M) CRS Class: Not listed	12	$4,395,000	3	-
Orderville	Participating Community ID: 490086 Program date: 02/02/84	No currently effective map date listed CRS Class: Not listed	-	-	-	-
Washington County	Participating Community ID: 490224 Program date: 03/18/86	04/02/09 CRS Class: Not listed	37	$8,311,000	19	3
Apple Valley	Participating Community ID: 490026 Program date: 09/24/12	04/02/09 CRS Class: Not listed	6	$1,589,000	0	-
Enterprise	Participating Community ID: 490169 Program date: 04/01/87	04/02/09 CRS Class: Not listed	5	$600,000	0	-
Hildale	Participating Community ID: 490171 Program date: 09/02/16	04/02/09 CRS Class: Not listed	14	$2,602,000	0	-

Jurisdiction	NFIP Participation / Community ID / Program Date	Map / CRS Class	Policy Count	Coverage	Claims	Repetitive Loss
Hurricane	Participating Community ID: 490172 Program date: 02/02/84	04/02/09 CRS Class: Not listed	27	$7,213,000	2	-
Ivins	Participating Community ID: 490173 Program date: 08/23/82	04/02/09 CRS Class: Not listed	23	$7,479,000	6	-
La Verkin	Participating Community ID: 490174 Program date: 02/02/84	04/02/09 CRS Class: Not listed	2	$841,000	1	-
Leeds	Participating Community ID: 490175 Program date: 02/02/84	04/02/09 CRS Class: Not listed	1	$250,000	1	-
New Harmony	Participating Community ID: 490004 Program date: 03/05/10	04/02/09 CRS Class: Not listed	7	$1,618,000	1	-
Rockville	Participating Community ID: 490176 Program date: 12/10/09	04/02/09 CRS Class: Not listed	4	$347,000	0	-
St. George	Participating Community ID: 490177 Program date: 08/19/87	04/02/09 CRS Class: 6	106	$35,988,000	26	-
Santa Clara	Participating Community ID: 490178 Program date: 08/05/86	04/02/09 CRS Class: 10	6	$1,750,000	2	-
Springdale	Participating Community ID: 490179 Program date: 04/17/09	04/02/09 CRS Class: Not listed	9	$3,463,000	1	-

Jurisdiction	NFIP Participation / Community ID / Program Date	Map / CRS Class	Policy Count	Coverage	Claims	Repetitive Loss
Toquerville	Participating Community ID: 490180 Program date: 02/19/86	04/02/09 CRS Class: Not listed	5	$980,000	1	-
Virgin	Participating Community ID: 490181 Program date: 08/05/86	04/02/09(M) CRS Class: Not listed	7	$2,210,000	0	-
Washington City	Participating Community ID: 490182 Program date: 07/01/87	04/02/09 CRS Class: Not listed	29	$7,941,000	3	-

Table 24 retains the supplied NFIP participation, policy, coverage, claims, and repetitive-loss entries. Hyphens indicate that no value is provided in the source table, not zero. A community not listed in the supplied Community Status Book is not automatically classified as nonparticipating.

Hail

Hail is a form of frozen precipitation produced by strong thunderstorm updrafts. Hailstones grow as supercooled water freezes onto ice embryos and may range from pea-sized stones to much larger damaging hail. NWS generally considers hail severe when hailstones reach 1 inch or greater in diameter.

In the five-county region, hail commonly occurs during the spring and summer months when daytime surface heating, frontal systems, and monsoonal moisture contribute to thunderstorm development. The complex topography of southwestern and south-central Utah can enhance atmospheric instability and support strong storm updrafts capable of producing hail. While much of the region is semi-arid, isolated but intense thunderstorms frequently generate small to moderate hailstones, and occasionally severe storms produce hail large enough to damage roofs, vehicles, crops, outdoor equipment, and critical facilities.

Hail occurrence varies across the planning area; however, differences in population, development, reporting density, and observation coverage limit direct comparisons among counties. Event counts alone do not establish relative risk because exposed assets and documented impacts also influence potential losses.

Location

Hail risk within the five-county planning area varies geographically and is influenced by differences in storm frequency, terrain-enhanced convection, population exposure, and reporting density. Analysis of NOAA Storm Events Database records, FEMA's NRI annualized frequency data, and regional climatology from the NOAA Storm Prediction Center indicates that hail incidence and potential impacts are not evenly distributed across the region.

Available hail reports indicate that Washington and Iron Counties have among the greatest documented exposure to hail impacts; however, differences in reporting density, population, development, and observation coverage complicate direct county-to-county comparisons. These reporting limitations prevent a definitive county risk ranking from event counts alone.

Garfield and Beaver Counties experience a moderate hail risk. In Garfield County, hail events are commonly associated with high-elevation thunderstorms over plateaus and mountainous terrain. While events are often localized, some storms have produced large hail, potentially impacting transportation routes, recreation areas, and infrastructure. Beaver County also experiences intermittent hail events, including occasional large hail. Although reporting density is lower than in more populated counties, confirmed severe hail occurrences have been documented, and agricultural assets and major transportation corridors remain vulnerable during severe storms.

Kane County has the lowest relative hail risk among the five counties. Historical records indicate fewer documented hail events over multi-year periods. Storms in Kane County tend to be more isolated and terrain-driven, with less frequent severe hail occurrences. Lower population density and limited infrastructure concentration reduce overall exposure and potential losses compared to other counties in the planning area.

Magnitude and Extent

The TORRO Hailstorm Intensity Scale is a standardized framework developed by the Tornado and Storm Research Organisation (TORRO) to classify hailstorms based on hailstone size, associated kinetic energy, and observed damage impacts. The scale ranges from H0 (non-damaging, pea-sized hail) to H10 (super hailstorms producing hailstones greater than 100 mm in diameter), providing a consistent method for assessing hail severity and potential risk to life and property. By linking physical measurements of hailstones to typical damage outcomes, the TORRO scale supports post-event analysis, improves hazard communication, and aids emergency management and risk mitigation planning for severe convective storms.

Table 25 summarizes the TORRO Hailstorm Intensity Scale, including intensity categories, typical hail diameters, probable kinetic energy, and damage impacts. Categories range from H0 (Hard hail, with no damage) to H10 (Super Hailstorms, with extensive structural damage and potentially fatal injuries to people caught outdoors).

Table 25: TORRO Hailstorm Intensity Scale[59]

Scale	Intensity Category	Typical Hail Diameter (mm)	Probable Kinetic Energy (J m $^{-2}$)	Typical Damage Impacts
H0	Hard hail	5	0–20	No damage
H1	Potentially damaging	5–15	>20	Slight general damage to plants, crops
H2	Significant	10–20	>100	Significant damage to fruit, crops, and vegetation
H3	Severe	20–30	>300	Severe damage to fruit and crops, damage to glass and plastic structures, and paint and wood scored
H4	Severe	25–40	>500	Widespread glass damage, vehicle bodywork damage
H5	Destructive	30–50	>800	Wholesale destruction of glass, damage to tiled roofs, and significant risks of injuries
H6	Destructive	40–60	*	Bodywork of grounded aircraft dented; brick walls pitted
H7	Destructive	50–75	*	Severe roof damage, risk of serious injuries
H8	Destructive	60–90	*	Severe damage to the aircraft's bodywork
H9	Super Hailstorms	75–100	*	Extensive structural damage. Risk of severe or even fatal injuries to people caught in the open
H10	Super Hailstorms	>100	*	Extensive structural damage. Risk of severe or even fatal injuries to people caught in the open

*Kinetic-energy values are not provided by TORRO for H6 through H10. Hail diameter ranges are approximate; hailstone number, density, fall speed, and surface winds also affect severity.

Table 26 outlines the National Weather Service Melbourne office's hail threat levels. These forecast threat descriptions illustrate hail severity and are not the plan's long-term probability categories.

[59] The Tornado and Storm Research Organisation, "The TORRO Hailstorm Intensity Scale," 2026, https://www.torro.org.uk/research/hail/hscale.

Table 26: National Weather Service Hail Damage-Threat Categories

Damage-Threat Category	National Weather Service Hail Criterion
Base	Hail at least 1.00 inch in diameter (approximately quarter-sized). This is the baseline hail criterion for a Severe Thunderstorm Warning.
Considerable	Hail at least 1.75 inches in diameter (approximately golf ball-sized). Warnings meeting this threshold may include a "considerable" damage-threat tag.
Destructive	Hail at least 2.75 inches in diameter (approximately baseball-sized). Warnings meeting this threshold may include a "destructive" damage-threat tag and trigger a Wireless Emergency Alert.

Previous Occurrences

NOAA Storm Events records document recurring hail events throughout the five-county planning area. Historical records indicate that hail is a recurring hazard across southwestern Utah, although the frequency, size, and reported impacts vary by county and by storm season. In the five-county planning area, documented hail events are most often associated with spring and summer thunderstorms and tend to be localized, affecting specific communities, transportation corridors, agricultural areas, and outdoor assets rather than the entire region at once. The following discussion summarizes disaster declaration history and recorded hail events to illustrate the pattern of past occurrence across Beaver, Iron, Kane, Garfield, and Washington Counties and to provide context for evaluating future hail risk.

DISASTER DECLARATION HISTORY

FEDERAL DISASTER DECLARATIONS

The reviewed OpenFEMA Utah declaration records identify no declaration explicitly titled for hail with a designated county in the five-county planning area. DR-1285-UT, titled Tornado, Severe Thunderstorms, and Hail, designated Salt Lake County, outside the planning area. Declaration titles do not provide a complete inventory of hail occurring during severe storms.[60]

STATE DISASTER PROCLAMATIONS

State emergency declarations may address broader severe-weather impacts and are not used as an inventory of hail occurrence. This profile evaluates hail recurrence using observed hail reports rather than inferring occurrence or absence from state proclamation titles.

[60] FEMA, OpenFEMA Disaster Declarations Summaries, version 2, Utah records retrieved October 10, 2026, https://www.fema.gov/openfema-data-page/disaster-declarations-summaries-v2.

NCEI EVENTS

Table 27 lists 17 NCEI hail event records on 14 distinct calendar dates during 2021–2025, filtered to the five counties and reported diameters of at least 1 inch. Reported property damage totals $80,000, with no reported crop damage, injuries, or deaths. The three June 21, 2024, Glen Canyon entries are separate database observations: Event 1196872 at Ice Cream Canyon, Event 1196873 at Lone Rock Beach, and Event 1196875 at Amangiri Resort.

Table 27: NCEI Storm Events Database Hail Records, Diameter at Least 1 Inch, 2021–2025

Date	Event Type	Location	Magnitude (inches)	Fatalities	Injuries	Property Damage	Crop Damage
7/14/2021	Hail	Enoch	1.00	0	0	$0	$0
7/22/2021	Hail	Bryce Canyon	1.50	0	0	$0	$0
7/24/2021	Hail	Veyo	1.00	0	0	$0	$0
7/29/2021	Hail	Beaver	1.25	0	0	$0	$0
8/1/2021	Hail	Enoch	1.00	0	0	$0	$0
8/14/2021	Hail	St. George Regional Airport (SGU)	1.00	0	0	$0	$0
8/17/2021	Hail	Beaver	2.00	0	0	$20,000	$0
8/21/2022	Hail	Enterprise Municipal Airport	1.50	0	0	$0	$0
8/22/2022	Hail	Washington	1.00	0	0	$0	$0
10/1/2022	Hail	Boulder	1.75	0	0	$7,500	$0
10/2/2022	Hail	Boulder	1.00	0	0	$0	$0
10/2/2022	Hail	Cedar City Regional Airport (CDC)	1.50	0	0	$40,000	$0
6/15/2023	Hail	Beryl Junction	1.00	0	0	$0	$0
9/13/2023	Hail	Rockville	1.00	0	0	$7,500	$0
6/21/2024	Hail	Glen Canyon / Ice Cream Canyon	1.75	0	0	$5,000	$0
6/21/2024	Hail	Glen Canyon / Lone Rock Beach	1.75	0	0	$0	$0

Date	Event Type	Location	Magnitude (inches)	Fatalities	Injuries	Property Damage	Crop Damage
6/21/2024	Hail	Glen Canyon / Amangiri Resort	1.75	0	0	$0	$0

Table 28 provides recent hailstorm event and impacts data for southwest Utah (2023–2025), as reported by the commercial hail-mapping service Hail Point, and includes dates, locations, hail sizes, and estimated exposure. These supplemental estimates are not verified damage counts and are not directly interchangeable with NCEI point observations.

Table 28: Key Storm Events and Impacts (Southwest Utah, 2023–2025)[61]

Date and Location	Hail Size (Inches)	Estimated Homes Affected	Notes
Oct. 10, 2025 – St. George, Utah	1.75	Approximately 314 homes	Population of 759 reported for the affected area.
Oct. 18, 2024 – St. George, Utah	1.25	Approximately 719 homes	Population of 1,939 reported for the affected area.
Sep. 13, 2023 – St. George, Utah	1.50	Approximately 115 homes	Commercial estimate: population of 1,008 reported for the modeled affected area. NCEI separately reports 1.00-inch hail at Rockville on this date

Probability of Future Occurrences

Hail is rated Highly Likely for occurrence somewhere in the five-county region, consistent with the plan's annual-or-more-frequent category. The reviewed 2021–2025 NCEI records contain hail of at least 1 inch on 14 distinct calendar dates. This regional classification does not mean that each jurisdiction or property experiences damaging hail annually.

The 2021–2025 NOAA record confirms that hail-producing thunderstorms recur across the planning area, although individual events are localized and do not affect every county or jurisdiction each year. This documented regional recurrence supports the plan's Highly Likely rating without implying annual hail impacts at any specific location.

Although much of southern Utah is characterized by a semi-arid climate, seasonal weather conditions, particularly during the spring and summer months, support the development of severe thunderstorms

[61] Hail Point, Hail Maps—St. George, Utah, entries dated September 13, 2023, October 18, 2024, and October 10, 2025, retrieved October 10, 2026. Reported estimated homes: 115, 719, 314; estimated population: 1,008, 1,939, 759, respectively. https://www.hailpoint.com/hail-maps-St.-George--UT.

capable of producing hail. These storms are often associated with frontal passages, daytime heating, and monsoonal moisture influxes, which can generate strong updrafts necessary for hail formation.[62] As a result, hail events will likely remain a recurring seasonal hazard across the five-county planning area.

Future hail risk is expected to persist as development continues in areas exposed to severe weather and as existing buildings, infrastructure, and agricultural assets remain vulnerable to hail damage. Residential structures, vehicles, roofing materials, crops, and critical facilities may experience repeated impacts, even from relatively small hail events. While climate variability may influence storm intensity or frequency, the historical record supports the conclusion that hail-producing storms will continue to affect the planning area at a level sufficient to warrant ongoing consideration.

Overall, the probability of future hail occurrence in the Five County AOG planning area is Highly Likely, based on documented recurring hail events across Beaver, Iron, Kane, Garfield, and Washington Counties and continued exposure to seasonal convective thunderstorms. Population growth and development affect exposure and potential consequences, rather than establishing a higher probability of hail occurrence.

Factors such as population growth and increased development are expected to increase hail risk by expanding the number and concentration of people, structures, vehicles, and infrastructure exposed to hail-prone weather conditions. As development continues across the five counties, potential property damage, economic losses, and social disruptions from future hail events are expected to increase.

Future hail exposure may increase as population, housing, vehicles, infrastructure, agricultural assets, and economic activity continue to grow in hail-prone areas. The available scientific literature does not support a precise county-level projection of future hail frequency; therefore, this profile emphasizes increasing exposure and consequence rather than a quantified change in hail occurrence.

Vulnerability Assessment

The vulnerability assessment evaluates how hail may affect people, housing, public facilities, critical infrastructure, transportation systems, agricultural assets, and economic activity across Beaver, Iron, Kane, Garfield, and Washington Counties. This section considers differences in population, development patterns, land use, and documented storm activity to identify where exposure is greatest and which assets are most susceptible to damage, service disruption, and economic loss from future hail events. Although hail impacts are often localized, even short-duration storms can produce costly damage to roofs, vehicles, crops, utilities, and outdoor equipment, making vulnerability highly dependent on both the location of assets and the severity of individual events.

[62] National Oceanic and Atmospheric Administration, “Thunderstorms Hazards-Hail,” https://www.noaa.gov/jetstream/hail.

BEAVER COUNTY

Beaver County's hail vulnerability is driven less by population density than by the exposure of agricultural assets, transportation corridors, public facilities, and scattered rural development to severe convective storms. Historical storm reports document at least two recent hail events in the Beaver area, including a 1.25-inch hail event on July 29, 2021, and a 2.00-inch hail event on August 17, 2021, confirming that the county is susceptible to damaging hail capable of affecting structures, vehicles, crops, and outdoor equipment. Because Beaver County is geographically large and sparsely populated, reported events likely underrepresent actual hail occurrence, particularly in outlying agricultural and rangeland areas. Lower documented frequency does not necessarily indicate lower hazard potential.

The county's most vulnerable assets include irrigated cropland, hay and alfalfa production, pasture and livestock operations, farm structures, vehicles, utility infrastructure, and buildings in and around Beaver, Minersville, Milford, and other developed areas. Hail can damage roofing, siding, windows, solar equipment, and HVAC units, but in Beaver County the greatest relative losses may occur in agriculture, where a single storm during the growing season can reduce forage yields, bruise or shred crops, damage fencing and pivots, and increase costs for producers already operating under drought and water-supply constraints. Publicly owned facilities, schools, emergency service buildings, and transportation-dependent services are also vulnerable because damage to roofs, fleet vehicles, communications equipment, or maintenance yards can interrupt service delivery. Interstate 15, State Route 21, and other county roads create additional exposure because hail can rapidly reduce visibility, create hazardous driving conditions, and damage vehicles traveling through the county.

Owner-occupied homes in Beaver County have a median value of about $283,700.[63] This indicator demonstrates that, although Beaver County has fewer structures and residents than more urban counties, it still has a meaningful concentration of exposed residential, agricultural, and infrastructure assets that support a moderate countywide hail vulnerability with higher localized risk in developed and irrigated agricultural areas.

Estimated vulnerable assets in Beaver County that may be exposed to hail include the following:

- Approximately 7,301 residents who may be exposed directly or indirectly through property damage, travel disruption, or service interruption.
- About 3,067 housing units that may be vulnerable to roof, siding, window, and skylight damage.[64]

[63] U.S. Census Bureau, "QuickFacts: Beaver County, Utah," 2026, https://www.census.gov/quickfacts/fact/table/beavercountyutah/INC110224; U.S. Department of Agriculture, "2022 Census of Agriculture County Profile-Beaver County Utah," 2022, https://www.nass.usda.gov/Publications/AgCensus/2022/Online_Resources/County_Profiles/Utah/cp49001.pdf.
[64] U.S. Census Bureau, "QuickFacts: Beaver County, Utah," 2026, https://www.census.gov/quickfacts/fact/table/beavercountyutah/INC110224.

- An estimated 267 farms and ranch operations with exposure to crop loss, damaged fencing, pivots, barns, sheds, and agricultural equipment.[65]
- Approximately 119,496 acres of land in farms, including 26,787 irrigated acres and more than 20,800 acres of forage production that are susceptible to hail damage during the growing season.[66]
- Public buildings, schools, emergency service facilities, and utility assets in and around Beaver, Milford, Minersville, and other developed areas.
- Major transportation assets, including Interstate 15, State Route 21, local roads, fleet vehicles, and privately owned vehicles exposed to hail-related damage and hazardous travel conditions.
- Outdoor infrastructure and equipment such as HVAC units, solar installations, communications equipment, maintenance yards, and other exposed county and private assets.

Overall, Beaver County has a moderate hail vulnerability with localized areas of elevated risk where agricultural production, exposed infrastructure, and concentrated community assets coincide. Vulnerability is heightened by limited warning time, the dispersed nature of development, longer repair and replacement timelines in rural areas, and the county's dependence on weather-sensitive economic sectors. Beaver County's vulnerability is best understood as a combination of exposure, sensitivity, and recovery capacity: while the total number of exposed structures is lower than in more urban counties, the functional importance of individual assets and the potential for disproportionate economic disruption make hail a meaningful hazard for Beaver County.

In Beaver County, the most likely hail impacts include damage to roofs, siding, windows, skylights, vehicles, and outdoor equipment; crop and forage losses; injury to livestock and people caught outdoors; and temporary disruption to transportation and public services. Hail occurring during late spring and summer can be especially damaging because it coincides with the active growing season and peak use of outdoor infrastructure and road networks. Even when structural damage is limited, repeated smaller hail events can shorten the useful life of roofing materials, solar panels, and agricultural equipment, increasing maintenance and replacement costs over time. Because the county relies on agriculture, trucking, public infrastructure, and dispersed service delivery, hail impacts may be felt through direct property damage as well as indirect business interruption, reduced agricultural productivity, emergency response demands, and short-term road safety hazards.

Cascading impacts: Hail in Beaver County can produce several cascading impacts that extend beyond the initial storm damage. Crop losses may reduce seasonal farm income, strain livestock feed supplies, and increase operating costs for agricultural producers. Damage to power lines, communications equipment, or public facilities can temporarily interrupt essential services, while roof and vehicle damage may delay emergency response, inspections, and routine government operations. On major transportation routes, hail can trigger vehicle accidents or temporary traffic disruptions that affect commuting, freight movement, and access to regional services. In a rural county with limited local repair capacity, even

[65] U.S. Department of Agriculture, "2022 Census of Agriculture County Profile-Beaver County Utah," 2022, https://www.nass.usda.gov/Publications/AgCensus/2022/Online_Resources/County_Profiles/Utah/cp49001.pdf.
[66]U.S. Department of Agriculture, "2022 Census of Agriculture County Profile-Beaver County Utah," 2022, https://www.nass.usda.gov/Publications/AgCensus/2022/Online_Resources/County_Profiles/Utah/cp49001.pdf.

moderate hail events can create extended recovery periods, higher insurance and out-of-pocket costs, and compounding financial stress for households, ranchers, and businesses. These secondary effects reinforce the need for mitigation actions such as impact-resistant roofing and siding, protection of critical outdoor equipment, improved warning dissemination, and continuity planning for county facilities and essential services.

Changes in development: Continued residential, commercial, energy, and transportation development in and around Beaver, Milford, Minersville, and the Interstate 15 corridor will increase the number and value of structures, vehicles, utilities, and outdoor systems exposed to hail. Expansion of irrigated agriculture, solar installations, and other weather-sensitive facilities may also increase potential losses even if the frequency of hail does not change. Applying current building codes, impact-resistant roofing and glazing, protected equipment siting, covered fleet or equipment storage, and resilient utility design to new development can limit the growth in vulnerability. Development review should therefore consider hail-resistant materials and continuity needs for critical facilities while recognizing that growth changes exposure and consequences, not the underlying probability of hail occurrence.

GARFIELD COUNTY

Garfield County's hail vulnerability is shaped by its dispersed rural settlement pattern, high-elevation thunderstorm environment, reliance on tourism and transportation access, and the exposure of agricultural and community assets across a very large geographic area. Recent hail reports in the county confirm that Garfield County is susceptible to damaging hail, including a 1.50-inch event near Bryce Canyon on July 22, 2021, a 0.88-inch event near Ruby's Inn on August 17, 2021, and a 1.75-inch event near Boulder on October 1, 2022. These events demonstrate that hail in Garfield County can affect developed areas, visitor-serving destinations, highways, and agricultural lands, even when storms are localized. Because the county is sparsely populated and includes extensive remote terrain, documented hail frequency likely understates the full extent of exposure in outlying communities and along travel corridors.

The county's most vulnerable assets include homes and public buildings in Panguitch, Escalante, Boulder, Tropic, Cannonville, Hatch, and other small communities; tourism-related businesses and lodging facilities near Bryce Canyon National Park and along Scenic Byway 12; agricultural lands and livestock operations; utility infrastructure; and vehicles traveling on U.S. Highway 89, Scenic Byway 12, and other local roads. In Garfield County, hail vulnerability is heightened by the importance of visitor access and the economic role of recreation and tourism. Hail can damage roofs, windows, vehicles, solar equipment, signage, and outdoor recreation infrastructure, while also creating hazardous driving conditions and reducing access to parks, lodging, campgrounds, and small business districts. Agricultural producers are also vulnerable because hail during the growing season can damage forage, crops, fencing, and equipment, increasing costs in a county with limited local repair and replacement capacity.

Owner-occupied homes in Garfield County have a median value of about $318,100.[67] In addition, Garfield County's economy includes a substantial visitor-serving sector, with accommodation and food service sales exceeding $59 million, reflecting the importance of lodging, dining, and tourism-related assets that may be disrupted by severe hail.[68] These indicators show that, although Garfield County has a relatively small permanent population, it has a meaningful concentration of exposed residential, agricultural, transportation, and tourism-supporting assets that contribute to a moderate hail vulnerability with elevated localized risk in communities, visitor destinations, and irrigated agricultural areas.

Estimated vulnerable assets in Garfield County that may be exposed to hail include the following:

- Approximately 5,290 residents who may be affected directly by hail or indirectly through property damage, travel disruption, and service interruption.[69]
- About 3,803 housing units that may be vulnerable to roof, siding, window, and skylight damage.[70]
- An estimated 297 farms and ranch operations with exposure to crop loss, damaged fencing, barns, sheds, pivots, and agricultural equipment.[71]
- Approximately 85,397 acres of land in farms, including 15,721 irrigated acres and about 13,109 acres of forage production that are susceptible to hail damage during the growing season.[72]
- Tourism-related lodging, restaurants, campgrounds, visitor services, and other commercial assets near Bryce Canyon National Park, Scenic Byway 12, and U.S. Highway 89.
- Public buildings, schools, emergency service facilities, utility assets, and community infrastructure in Panguitch, Escalante, Boulder, Tropic, Cannonville, Hatch, and surrounding areas.
- Major transportation assets, including U.S. Highway 89, Scenic Byway 12, local roads, fleet vehicles, private vehicles, and visitor traffic exposed to hail-related damage and hazardous travel conditions.
- Outdoor infrastructure and recreation-related assets such as signage, trailhead facilities, campground equipment, solar installations, HVAC units, and communications equipment.

Overall, Garfield County has a moderate hail vulnerability with localized areas of elevated risk where community assets, tourism infrastructure, transportation corridors, and agricultural production overlap. Vulnerability is increased by limited warning time, long travel distances, geographic isolation, reliance on

[67] U.S. Census Bureau, "QuickFacts: Garfield County, Utah," 2026, https://www.census.gov/quickfacts/fact/table/garfieldcountyutah/PST045219; U.S. Department of Agriculture, "2022 Census of Agriculture County Profile-Garfield County Utah," 2022, https://www.nass.usda.gov/Publications/AgCensus/2022/Online_Resources/County_Profiles/Utah/cp49017.pdf.
[68] Utah.gov, "Department of Workforce Services-Local Insight, Garfield County Snapshot," 2026, https://jobs.utah.gov/wi/insights/county/garfield.html.
[69] U.S. Census Bureau, "QuickFacts: Garfield County, Utah," 2026, https://www.census.gov/quickfacts/fact/table/garfieldcountyutah/PST045219.
[70] U.S. Census Bureau, "QuickFacts: Garfield County, Utah," 2026, https://www.census.gov/quickfacts/fact/table/garfieldcountyutah/PST045219.
[71] U.S. Department of Agriculture, "2022 Census of Agriculture County Profile-Garfield County Utah," 2022, https://www.nass.usda.gov/Publications/AgCensus/2022/Online_Resources/County_Profiles/Utah/cp49017.pdf.
[72] U.S. Department of Agriculture, "2022 Census of Agriculture County Profile-Garfield County Utah," 2022, https://www.nass.usda.gov/Publications/AgCensus/2022/Online_Resources/County_Profiles/Utah/cp49017.pdf.

weather-sensitive economic sectors, and the county's constrained repair and recovery capacity in remote areas.

Likely hail impacts in Garfield County include roof, siding, window, vehicle, and outdoor-equipment damage; losses to forage and other agricultural production; and short-term disruption to travel, visitor services, and public operations. Severe hail along U.S. Highway 89, Scenic Byway 12, or access routes to recreation destinations can create sudden visibility and roadway hazards while damaging visitor and fleet vehicles. Localized storms can also affect lodging, restaurants, campgrounds, schools, emergency facilities, and utility equipment. Because tourism and agriculture are both weather-sensitive, even a geographically limited event may create losses disproportionate to the permanent population affected.

Cascading impacts: Cascading effects may include road closures or crashes that delay emergency response and visitor movement; damage to utility or communications equipment that interrupts service in remote communities; and closure or reduced operation of lodging, recreation, and commercial facilities. Agricultural damage can reduce feed availability and producer income, while damaged roofs and vehicles can strain limited local contractors, parts supplies, and insurance resources. If hail accompanies heavy rain, lightning, or strong winds, simultaneous demands on transportation, utilities, and public works may prolong restoration. Geographic isolation and long travel distances can further extend repair timelines and increase costs for households, businesses, and local government.

Changes in development: New housing, visitor accommodations, commercial facilities, transportation improvements, and recreation infrastructure in and near established communities and tourism corridors will increase the inventory of roofs, windows, vehicles, signage, solar equipment, and outdoor assets exposed to hail. Growth near Bryce Canyon, along Scenic Byway 12 and U.S. Highway 89, and in community service centers may concentrate future losses and increase continuity demands during peak visitor periods. Use of impact-resistant materials, protected mechanical and communications equipment, covered fleet storage, and resilient design for public and visitor-serving facilities can reduce added vulnerability. Changes in development are expected to increase potential consequences and replacement costs rather than the climatological likelihood of hail.

IRON COUNTY

Iron County's hail vulnerability includes concentrated residential, public, commercial, and transportation assets in the Cedar City and Enoch area, as well as rural agricultural assets. Table 3 documents 1.00-inch hail at Enoch and Beryl Junction and 1.50-inch hail at Cedar City Regional Airport, where the October 2, 2022, record reports $40,000 in property damage. Although the City of Enterprise is in Washington County, the August 21, 2022, Enterprise Municipal Airport hail record is included here because NCEI coded the event to Iron County. Exposed assets include roofs, windows, vehicles, airport facilities, schools, public buildings, utilities, and agricultural equipment. Potential impacts include property damage, hazardous travel, agricultural losses, and interruption of public services or business activity. Vehicle and equipment damage may delay emergency response and repairs; localized utility interruptions may compound service disruption.

Concentrated development in Cedar City, Enoch, and nearby communities places a larger inventory of homes, businesses, schools, health and emergency facilities, airport assets, and public fleets within areas where severe hail has been documented. Rural portions of the county add exposure from farms, ranches, irrigation systems, outbuildings, solar installations, and long transportation and utility corridors. Roofing, siding, glazing, HVAC equipment, communications systems, vehicles, aircraft, and agricultural equipment are particularly susceptible. The documented Cedar City Airport loss illustrates how a localized storm can affect specialized facilities and assets with high repair or replacement costs.

Likely impacts include damage to residential and commercial roofs, windows, siding, vehicles, aircraft, public fleets, outdoor equipment, and agricultural production. Hail can create abrupt visibility and traction hazards on Interstate 15, State Route 56, local roads, and airport operating areas, increasing the potential for crashes, flight or ground-operation delays, and emergency response demands. Damage to schools, government buildings, utilities, or major employers may interrupt normal operations, while repeated smaller events can shorten the service life of building envelopes and exposed equipment. Agricultural producers may experience crop, forage, fencing, and equipment losses during the growing season.

Cascading impacts: Cascading impacts may include utility or communications outages, transportation delays, school or facility closures, and reduced availability of emergency vehicles or public works equipment. Airport damage or operational restrictions can affect regional access and time-sensitive travel, while road incidents can disrupt freight and commuter movement. Agricultural losses may reduce producer income and available feed, and a surge in roof, glass, and vehicle claims may strain contractors, repair shops, and insurance processing. When hail occurs with heavy rain, lightning, or strong winds, simultaneous damage can increase debris-management needs and extend service restoration.

Changes in development: Continued growth in the Cedar City–Enoch area and along major transportation corridors will increase the number and value of homes, businesses, vehicles, public facilities, and utility systems exposed to hail. Expansion of airport-related, industrial, educational, residential, renewable-energy, and agricultural development may add specialized or outdoor assets that are costly to protect and replace. Incorporating impact-resistant roofing and glazing, sheltered equipment and fleet storage, protected rooftop systems, and continuity measures for critical facilities can reduce the vulnerability added by growth. Development changes are expected to increase exposure and potential losses even where hail frequency remains unchanged.

KANE COUNTY

Kane County's hail vulnerability includes dispersed residential and infrastructure assets exposed to localized thunderstorms. Table 3 includes the June 21, 2024, Glen Canyon records with 1.75-inch hail; the verified records represent separate observations at Ice Cream Canyon, Lone Rock Beach, and Amangiri Resort, rather than three independently counted storms. Lower reporting density does not eliminate the potential for damaging hail. Exposed roofs, windows, vehicles, outdoor equipment, agricultural assets, and transportation routes may sustain damage. Potential impacts include hazardous travel, repair costs, crop losses, and temporary service interruptions. Damage to vehicles or essential equipment may delay response and recovery in dispersed areas.

The county's exposure is concentrated in Kanab and smaller communities, visitor-serving properties, public facilities, transportation corridors, utility systems, and recreation destinations associated with Glen Canyon and other federal lands. Lodging, resorts, campgrounds, marinas, parked vehicles, rooftop systems, signage, communications equipment, and remote public-safety assets may be especially exposed because many are outdoors or depend on uninterrupted access. Agricultural and ranching operations may also sustain damage to forage, fencing, outbuildings, and equipment. Sparse settlement reduces the total number of exposed structures but can increase the functional importance of each damaged facility or route.

Likely hail impacts include damage to roofs, windows, vehicles, solar and mechanical equipment, recreation facilities, and agricultural assets, together with hazardous travel on U.S. Highway 89, U.S. Highway 89A, State Route 9, and remote local roads. Damage at resorts, campgrounds, visitor attractions, or lake-access facilities may disrupt tourism and seasonal employment even when residential impacts are limited. Hail can also injure people or livestock caught outdoors and increase demand for emergency response, inspections, and temporary protective measures. Remote locations may experience longer delays in damage assessment, material delivery, and repair.

Cascading impacts: Cascading impacts may include crashes or temporary route restrictions that delay emergency access and visitor movement; damage to utility or communications equipment that interrupts service in isolated areas; and reduced operation of lodging, recreation, and commercial facilities. Vehicle and fleet damage can constrain public-safety, maintenance, and tourism-support functions, while agricultural losses can affect producer income and feed availability. A concentrated demand for roofing, glass, and vehicle repair may exceed local contractor and parts capacity. If hail accompanies flash flooding, strong winds, or lightning, concurrent impacts can complicate evacuations, debris removal, and restoration.

Changes in development: New housing, resorts, visitor services, recreation facilities, renewable-energy systems, and transportation or utility improvements will increase the number and value of exposed assets, particularly near Kanab, established travel corridors, and major recreation destinations. Seasonal visitation may also place more vehicles and people outdoors during the thunderstorm season. Impact-resistant building materials, protected rooftop and communications equipment, covered fleet storage, redundant service arrangements, and all-weather emergency access can reduce vulnerability in new development. Growth changes the potential scale and distribution of losses rather than demonstrating an increase in hail probability.

WASHINGTON COUNTY

Washington County's hail vulnerability includes residential structures, vehicles, public facilities, infrastructure, and outdoor equipment. Table 3 documents hail at Veyo, St. George Municipal Airport, Washington, and Rockville; the Rockville record reports $7,500 in property damage. Table 4 provides supplemental commercial exposure estimates for the St. George area. Potential impacts include roof, window, vehicle, and equipment damage, hazardous travel, and interruption of business or public services.

Damage to public fleets, utility equipment, or occupied buildings may extend disruption beyond the storm and increase repair and recovery costs.

The county contains the planning area's largest concentration of residential, commercial, institutional, transportation, and utility assets, particularly in the St. George metropolitan area and surrounding communities. This concentration increases potential aggregate losses from a localized storm because many roofs, windows, vehicles, public fleets, schools, health care facilities, businesses, construction sites, solar installations, and outdoor amenities may be exposed at the same time. Visitor-serving properties, recreation facilities, and airport assets add seasonal and specialized exposure. Although hail footprints are often narrow, dense development can produce substantial claims and operational disruption within the affected area.

Likely impacts include widespread roof, siding, glazing, skylight, vehicle, solar-panel, HVAC, and landscaping damage within localized storm paths. Hail can also create dangerous travel conditions on Interstate 15, State Route 7, State Route 9, and urban streets, while affecting airport operations and outdoor events. Damage to medical, educational, emergency, utility, or government facilities may interrupt essential functions, and impacts to hotels, retail areas, recreation venues, and construction activity may produce short-term business losses. Repeated events can accelerate deterioration of roofing and exposed equipment even when individual storms do not cause major structural failure.

Cascading impacts: Cascading impacts may include traffic crashes and congestion, delayed emergency response, temporary utility or communications outages, school or facility closures, and reduced availability of public or private fleets. A large volume of simultaneous roof, glass, solar, and vehicle claims may strain contractors, repair shops, material supplies, and insurance processing, extending recovery and increasing costs. Business interruption may affect tourism, retail, health care, and construction, while damage to critical equipment can disrupt services beyond the directly affected neighborhood. If hail occurs with intense rainfall, strong winds, or lightning, concurrent flooding, debris, and power impacts may create compound response and recovery demands.

Changes in development: Rapid residential and commercial growth in and around St. George, Washington, Hurricane, Ivins, Santa Clara, and other communities will continue to add roofs, windows, vehicles, public facilities, utilities, solar systems, and outdoor amenities to the exposed inventory. Infill and higher-density development can increase the value of assets within a single hail footprint, while expansion toward the urban fringe may lengthen utility and emergency-service networks. Applying impact-resistant roofing and glazing, protected rooftop equipment, covered fleet storage, resilient design for critical facilities, and continuity planning can limit the increase in losses. Development is expected to increase exposure and consequences substantially even without a demonstrated change in hail frequency.

Landslide

A landslide is the downslope movement of a mass of rock, soil, debris, or earth under the influence of gravity. Landslides are classified as a form of mass wasting and can range from slow, gradual movements occurring over months or years to rapid, catastrophic failures that happen with little or no warning.[73]

Landslides encompass a wide variety of ground-movement processes, including falls, topples, slides, spreads, and flows, and may involve bedrock, debris, or soil. Common examples include rockfalls, debris flows (often referred to as mudflows), earthflows, and rotational or translational slides. The speed, size, and travel distance of a slide vary widely depending on slope conditions, material type, water content, and trigger mechanisms.

Landslides occur when the forces acting on a slope, primarily gravity, exceed the strength of the materials composing that slope. They are commonly triggered by intense or prolonged rainfall, rapid snowmelt, grading, and changes to natural drainage patterns. These factors can act alone or in combination to destabilize slopes. Additionally, soil types can contribute to slope instability and landslides.

Landslides can cause significant impacts to life, property, infrastructure, and the environment, including destruction of homes and roads, damage to utilities, blockage of waterways, and disruption to transportation networks. Landslides occur in all U.S. states and territories, particularly in mountainous, hilly, or steep-slope areas, and represent a recurring natural hazard.

Location

Landslide susceptibility occurs throughout the Five County AOG planning area where steep slopes, weak or highly fractured rock, unconsolidated deposits, pre-existing landslides, altered drainage, grading, groundwater, irrigation, intense precipitation, rapid snowmelt, erosion, or wildfire-related runoff reduce slope stability. The Utah Geological Survey (UGS) identifies debris flows, slides, and rockfalls as common Utah landslide types and notes that many recent failures are reactivations of pre-existing landslides. The county maps identify planning-level susceptibility; they do not establish that every mapped area will fail or that areas outside mapped classes are free of hazard.

County conditions vary. Beaver County includes susceptible mountain and canyon terrain associated with the Tushar Mountains and transportation corridors. Garfield and Kane Counties include steep plateau margins, cliffs, canyons, weak sedimentary units, and drainage systems susceptible to rockfall, slides, and debris flows. Iron County includes active and mapped landslide areas in Cedar Canyon, Cedar Highlands, and adjacent foothill settings. Washington County includes developed benches, foothills, incised drainages, and slope-modified areas where landslides and debris flows have affected transportation and residential development.

[73] U.S. Geological Survey, "What Is a Landslide and What Causes One?" https://www.usgs.gov/faqs/what-a-landslide-and-what-causes-one.

The Paiute Indian Tribe of Utah has lands within the planning area. This regional profile does not assign landslide exposure to a specific Tribal parcel without a documented overlay or Tribal confirmation. Parcel-specific Tribal exposure is not established by the information available for this profile.

Figure 29 depicts the supplied planning-level landslide-susceptibility map for Garfield County. The map provides regional screening context and does not establish parcel-level exposure or a probability of failure.

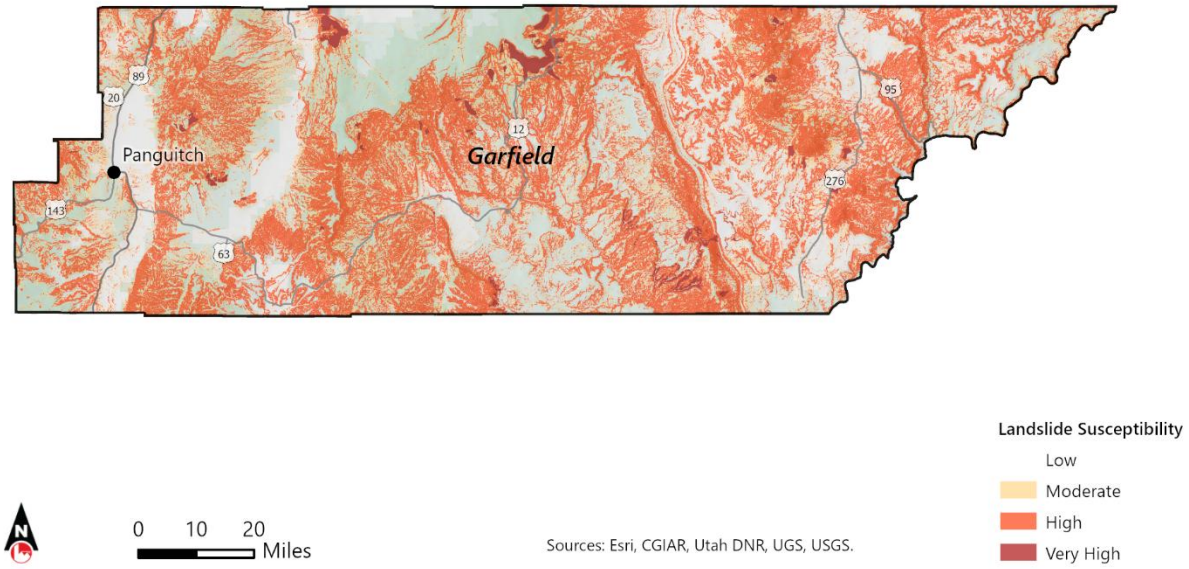


Figure 29: Garfield County Landslide Susceptibility Map

Figure 30 depicts planning-level landslide susceptibility in Washington County and identifies selected recent-event locations. Higher mapped susceptibility occurs in foothill, bench, canyon, and steep-slope settings. The map is a screening resource and does not replace site-specific investigation.

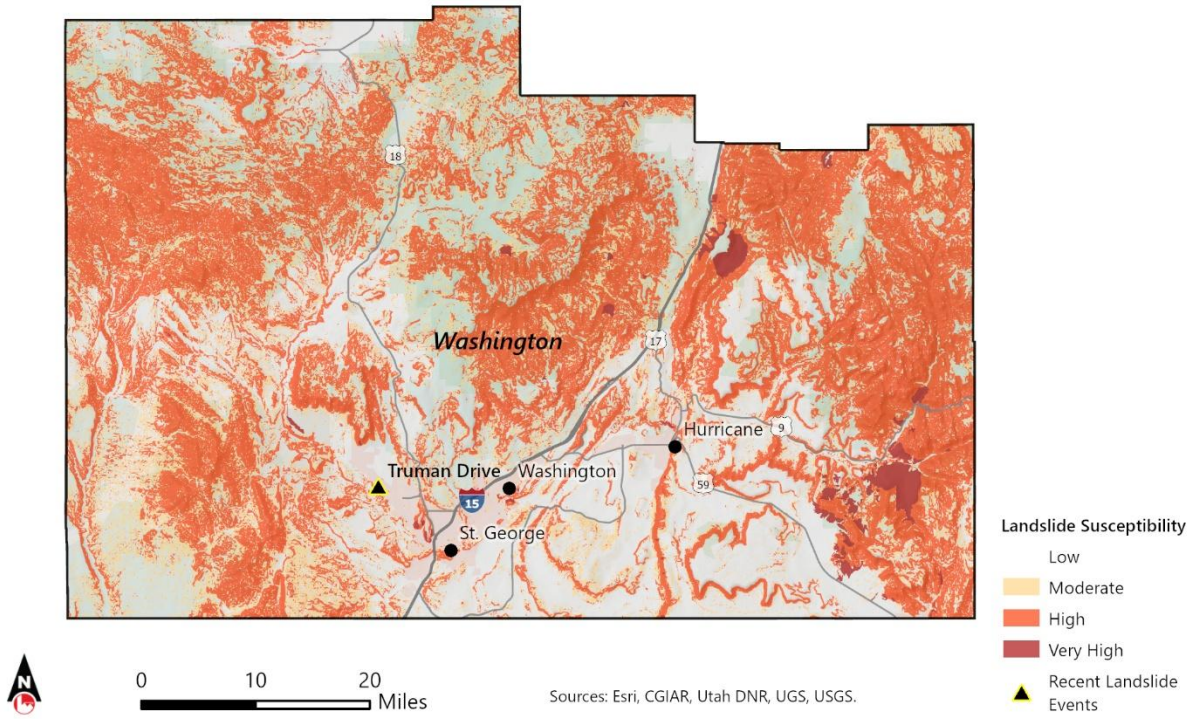


Figure 30: Washington County Landslide Susceptibility Map

Magnitude and Extent

Landslide magnitude may be described by displaced volume, affected area, movement rate, travel distance, depth, and consequences. The Universal Landslide Classification System shown in Table 29 provides order-of-magnitude size classes based on volume or mapped area. Because many local event records do not provide complete volume estimates, this plan also describes extent using mapped susceptibility, event dimensions where documented, and the assets or corridors affected.

The Universal Landslide Classification System provides a standardized method for describing and comparing landslide events based on their physical magnitude. The system categorizes landslides into numeric size classes using order-of-magnitude thresholds for displaced material volume or, when volume estimates are not available, mapped surface area. Each size class corresponds to a descriptive term that reflects the relative scale of the landslide, from very small shallow failures to extremely large, complex slope movements.

Table 29 presents the Universal Landslide Classification System as a reference for comparing the relative physical magnitude of documented landslide events by volume or mapped area.

Table 29: Universal Landslide Classification System[74]

Class	Descriptor	Minimum volume (m^3)	Minimum area (m^2)
14	Monster (trillions)	≥ 100,000,000,000,000	≥ 500,000,000,000
13		≥ 10,000,000,000,000	≥ 100,000,000,000
12		≥ 1,000,000,000,000	≥ 10,000,000,000
11	Giant (billions)	≥ 100,000,000,000	≥ 1,000,000,000
10		≥ 10,000,000,000	≥ 500,000,000
9		≥ 1,000,000,000	≥ 100,000,000
8	Large (millions)	≥ 100,000,000	≥ 10,000,000
7		≥ 10,000,000	≥ 1,000,000
6		≥ 1,000,000	≥ 500,000
5	Medium (thousands)	≥ 100,000	≥ 100,000
4		≥ 10,000	≥ 10,000
3		≥ 1,000	≥ 1,000
2	Small (ones)	≥ 100	≥ 500
1		≥ 10	≥ 100
0		≥ 1	≥ 10
−1	Very small (thousandths)	≥ 0.1	≥ 1
−2		≥ 0.01	≥ 0.5
−3		≥ 0.001	≥ 0.1

Previous Occurrences

Utah has a documented history of damaging landslides. The 1983 Thistle landslide illustrates the potential for major transportation, community, and economic consequences at the state level. Within the Five County AOG planning area, the occurrence record includes federally declared flooding and landslides in 2005 and multiple recent UGS-documented events affecting Iron, Kane, and Washington Counties.

FEMA Major Disaster Declaration DR-1598-UT addressed flooding and landslides with an incident period of April 28 through June 29, 2005. Within the planning area, Beaver, Iron, and Kane Counties were designated for Public Assistance; Garfield and Washington Counties were not listed. This profile treats the declaration as evidence of regional impacts but does not assume that every designated county experienced the same landslide mechanism or severity.

[74] S. T. McColl and S. J. Cook, "A Universal Size Classification System for Landslides," *Landslides* 21, 111–20, 2024, https://link.springer.com/article/10.1007/s10346-023-02131-6.

Table 30: Selected Federal Disaster Declaration Involving Flooding and Landslides[75]

Year	Declaration Number	Declaration Type	Title/Description
2005	DR-1598-UT	Federal	Flood and Landslide; Beaver, Iron, and Kane Counties were designated for Public Assistance within the planning area.

Table 31 presents selected UGS-documented 2023 landslide events in Iron, Kane, and Washington Counties. The table illustrates event type and scale but is not a complete inventory of landslides across the planning area. Event dates and dimensions reflect the cited UGS records and should not be generalized to countywide probability.

Table 31: Selected UGS-Documented Landslide Events in Iron, Kane, and Washington Counties, 2023[76]

Landslide Name/Location	County	Date	Size
Cedar Canyon, MP8 Landslide Complex (Eight miles east of Cedar City)	Iron	06/21/2023	New scarp nearly 1,000 feet wide with over 50 feet of vertical displacement; newly formed landslide nearly 6 acres.
Meadow Creek (SR-9, five miles east of Zion National Park east entrance)	Kane	06/06/2023	2 miles × 1.5 miles
Cedar Highlands (Cedar City)	Iron	06/06/2023	100 × 250 feet
Truman Drive (Santa Clara)	Washington	06/06/2023	300 × 150 feet
Right Hand Canyon Road (Cedar Canyon, five miles east of Cedar City)	Iron	05/09/2023	120 × 50 feet

On May 9, 2023, UGS documented a rotational landslide along Right Hand Canyon Road in Cedar Canyon, approximately five miles east of Cedar City. The event damaged the roadway, and subsequent observations documented continued movement. The event illustrates how stream erosion, fill, weak bedrock, and wet conditions can interact at a transportation corridor.

75 Federal Emergency Management Agency, DR-1598-UT designated areas, reviewed October 9, 2026, https://www.fema.gov/es/disaster/1598/designated-areas.

76 Utah Geological Survey, Landslide Current Events and Cedar Canyon, MP8 Landslide Complex, updated June 22, 2023. The MP8 scarp dimensions describe width and vertical displacement, not plan-view length. https://geology.utah.gov/hazards/landslides/current-events/; https://geology.utah.gov/portfolio-item/cedar-canyon-mp8-landslide-complex/.

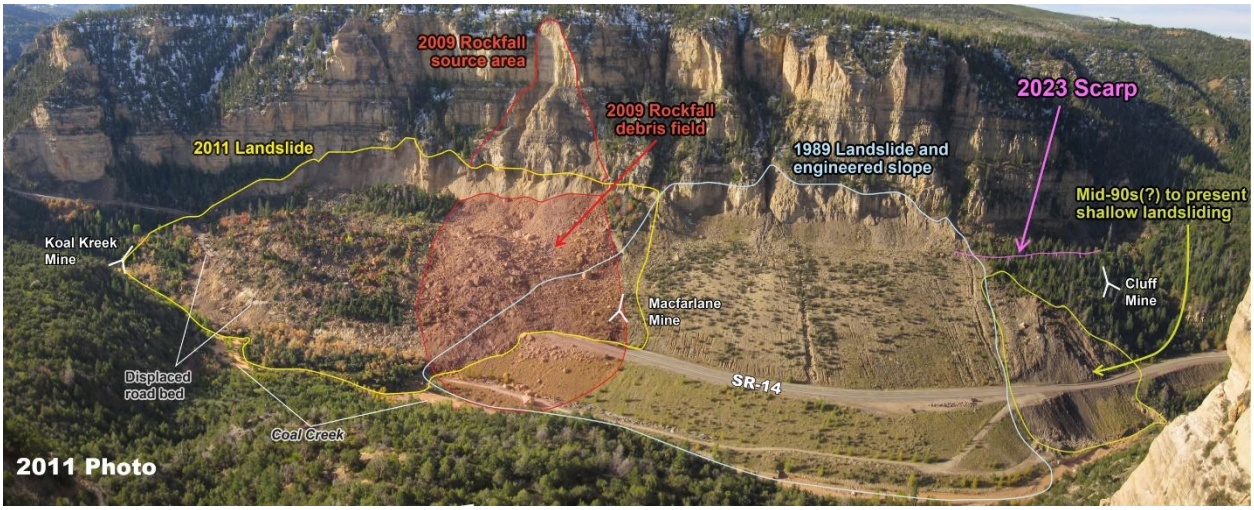


Figure 31: Cedar Canyon, MP8 Landslide Complex, Iron County[77]

Probability of Future Occurrences

Landslides are rated Likely under the Five County AOG probability methodology based on the documented recurrence of landslides, rockfalls, and debris flows in susceptible terrain, including multiple UGS-documented 2023 events and the 2005 federal disaster declaration. This regional rating indicates that an event is likely to occur somewhere within the five-county planning area; local probability and consequences vary by slope, geology, groundwater, drainage, disturbance, wildfire history, exposure, and route redundancy.

Potential triggers include prolonged or intense precipitation, rapid snowmelt, elevated groundwater, erosion or undercutting, grading, drainage modification, irrigation or leakage, earthquakes, and wildfire-related changes in runoff and soil conditions. Trigger significance varies by landslide type and site.

Future risk may change through both hazard and exposure pathways. More intense rainfall following wildfire can increase runoff-driven debris-flow potential on steep burned slopes, while development, grading, irrigation, and infrastructure expansion can increase exposure or alter slope stability. Broader regional climate information does not support a uniform projection for all landslide types or locations. Burn-scar assessments, groundwater conditions, slope performance, and development patterns inform changes in local risk.

Overall probability rating: Likely.

The evidentiary basis is the documented recurrence of slides, rockfalls, and debris flows in susceptible terrain, including multiple UGS-documented 2023 events and the 2005 federal declaration.

[77] Utah Geological Survey, Cedar Canyon, MP8 Landslide Complex, Iron County, updated June 22, 2023. The photograph illustrates the MP8 complex, not Right Hand Canyon Road. https://geology.utah.gov/portfolio-item/cedar-canyon-mp8-landslide-complex/.

Population growth and development do not change the underlying geologic probability by themselves, but they can increase exposure, modify drainage, add irrigation or loading, and place additional structures and lifelines in or below susceptible terrain. Jurisdiction-specific development changes since the previous plan approval are not established by the information available for this profile.

The regional probability is not described as uniformly increasing. Local changes depend on landslide type and location and are informed by updated susceptibility mapping, recent-event information, burn-scar assessments, groundwater and drainage observations, and jurisdiction-confirmed development patterns.

Landslide events are expected to continue to occur across the Five County AOG planning area due to widespread steep terrain, complex geology, exposure to weather, and wildfire-related triggering mechanisms. Historical documentation confirms recurring landslides, rockfalls, and debris flows throughout Beaver, Iron, Garfield, Kane, and Washington Counties, particularly along canyon systems, mountain fronts, and transportation corridors. These documented events demonstrate that landslides are not isolated or unusual occurrences, but a recurring regional hazard closely tied to terrain and environmental conditions. Therefore, the overall probability of future landslide occurrence across the planning area is assessed as Likely, with local variation influenced by slope, geology, land use, and recent disturbance.

Landslides are most often triggered by seasonal precipitation events, rapid snowmelt, and short-duration, high-intensity storms that increase slope saturation and destabilize weak or fractured geologic materials. In addition, post-wildfire conditions significantly elevate landslide and debris-flow risk by removing vegetation, increasing runoff, and reducing slope cohesion.[78] These conditions are present to varying degrees across all five counties and are expected to persist. While much of the planning area remains rural, critical infrastructure, including highways, local roads, utilities, recreation assets, and emergency access routes, frequently crosses landslide-prone terrain, resulting in continued exposure even where population density is low.

- Likely, based on documented historical landslides, rockfall, and debris flow events across all five counties, demonstrating recurring occurrence under known environmental conditions.
- Factors contributing to landslide risk include the following:
  - Extensive steep slopes, weak or erodible geologic materials, and narrow canyon systems
  - Seasonal precipitation, rapid snowmelt, and high-intensity storms
  - Wildfire exposure and post-fire debris flow susceptibility
  - Ongoing and projected development near hillsides, canyon corridors, and transportation routes

Factors such as population growth, expanded development in constrained terrain, and increased wildfire activity can increase future landslide risk by expanding the number and concentration of people, structures, and infrastructure exposed to unstable slopes. As development and use of landslide-prone

[78] USGS, "Post-Wildfire Debris Flow," 2024, https://www.usgs.gov/publications/post-wildfire-debris-flows.

areas continue across the counties and Tribal lands, potential property damage, service disruptions, and social and economic impacts from future landslide events may increase accordingly.

The regional probability of future landslide occurrence is assessed as Likely. Potential consequences vary locally with hazard conditions, exposure, and access redundancy; the available information does not establish a uniform increase in probability.

Vulnerability Assessment

Vulnerability refers to the people, property, infrastructure, natural and cultural resources, and community systems that may be damaged or disrupted by landslides, rockfalls, and debris flows. Across the Five County AOG planning area, vulnerability is concentrated where susceptible slopes, runout paths, canyon walls, drainage corridors, or unstable fill intersect development, transportation routes, utilities, recreation areas, and emergency access. Countywide population and housing totals provide planning context but are not estimates of direct exposure.

The five counties share steep terrain and geologic conditions that can produce slope failure, but their exposure patterns differ. Iron and Washington Counties include developed areas near active or susceptible slopes, while Beaver, Garfield, and Kane Counties depend heavily on long transportation and utility corridors through rugged terrain with limited alternate access. Direct exposure would require an overlay of current assets with landslide inventories, susceptibility mapping, runout areas, and site-specific investigations; that analysis is not available for this regional profile.

Potential consequences include injury or loss of life, damage to buildings and infrastructure, road closures, utility interruption, sediment and debris entering waterways, emergency-response delays, and economic losses from repairs and interrupted travel or tourism. The Paiute Indian Tribe of Utah has lands within the planning area, but parcel-specific Tribal vulnerability is not assigned without a documented spatial analysis and Tribal coordination.

BEAVER COUNTY

Beaver County's landslide vulnerability is concentrated in the Tushar Mountains, canyon systems, alluvial slopes, drainage crossings, and other areas where steep or disturbed terrain intersects Beaver City, Milford, Minersville, dispersed residences, agriculture, recreation, and public lands access. Intense precipitation, rapid snowmelt, erosion, wildfire effects, and altered drainage can initiate rockfall, debris flow, or shallow slope failure. Although the county's population is comparatively small, localized failures can have significant consequences where communities and facilities depend on a limited number of routes.

Potentially vulnerable assets include state and county roads, bridges, culverts, mountain and recreation access routes, electric and communications lines, water and drainage facilities, agricultural infrastructure, public facilities, residences, campgrounds, and trailheads. According to U.S. Census Bureau QuickFacts, Beaver County had a 2020 Census population of 7,072 and an estimated population of 7,301 as of July 1,

2025; the county had an estimated 3,102 housing units as of July 1, 2025, and 2,518 households during the 2020–2024 period. These countywide figures describe the development context; they do not indicate how many people or structures are in landslide-susceptible areas.

Likely direct impacts include debris deposition, roadbed or embankment failure, culvert blockage, structural damage, and damage to utilities that share constrained corridors. Indirect impacts may include detours, restricted access to homes, ranches and recreation sites, delayed emergency services, interrupted freight or school travel, and costs for debris removal, slope stabilization, roadway repair, and utility restoration. Beaver County's exposure is therefore driven primarily by lifeline dependence and limited route redundancy rather than widespread structural concentration.

Cascading impacts. A blocked mountain or canyon road can isolate residents, agricultural operations, and recreation users while delaying emergency response and repair crews. If utilities are co-located with the affected route, a single slope failure may also interrupt power, communications, or water service. Debris entering channels or blocking culverts can redirect runoff, increase localized flooding or erosion, degrade water quality, and contribute to additional slope instability.

Changes in development. Population growth does not by itself change underlying geology, but new construction, grading, irrigation, drainage modification, vegetation removal, and added loading can increase exposure or reduce slope stability when they occur in or below susceptible terrain. Expansion of residential, recreation, energy, or utility infrastructure into mountain and canyon settings could place additional assets on access-limited corridors. Jurisdiction-specific development changes since the previous plan are not established here and should be confirmed through local review and updated mapping.

GARFIELD COUNTY

Garfield County's vulnerability is concentrated along steep plateau margins, canyon walls, escarpments, weak sedimentary units, drainage crossings, and narrow travel corridors serving Antimony, Boulder, Bryce Canyon City, Cannonville, Escalante, Hatch, Henrieville, Panguitch, and Tropic. Rockfall, debris flow, and other slope failures may be triggered by intense rainfall, rapid snowmelt, erosion, or post-wildfire runoff. Permanent population is low, but seasonal visitation and dependence on constrained routes increase the number of people who may be exposed or isolated.

Potentially vulnerable assets include State Route 12, U.S. 89 and its approaches, county roads, bridges and culverts, co-located utilities, emergency and medical access, Bryce Canyon and Escalante-area visitor facilities, trailheads, campgrounds, lodging, residences, and public-land access points. Garfield County had a 2020 Census population of 5,083, an estimated 5,256 residents in 2025, approximately 2,042 households, and about 3,803 housing units countywide. These totals are not direct-exposure estimates; the greatest vulnerability occurs where assets intersect mapped susceptibility, steep canyon walls, or runout areas.

Likely impacts include rockfall or debris on roadways, embankment or bridge-approach damage, blocked drainage, damage to utilities, and isolation of small communities or visitor destinations. Closure of a

segment of State Route 12, an approximately 123-mile corridor connecting U.S. 89 and State Route 24, could affect residents, deliveries, emergency response, tourism, and access to high-visitation recreation areas. Economic consequences may include repair and detour costs, canceled trips, reduced visitor spending, and interrupted business activity.

Cascading impacts. A closure on a scenic byway or park-access route may delay emergency and medical transport, strand travelers, restrict deliveries, and reduce access to tourism-dependent communities well beyond the immediate slide area. Damage to co-located utilities can extend outages, while sediment or debris blocking a drainage crossing can redirect water, worsen erosion, and produce secondary flooding or additional slope failure.

Changes in development. New homes, lodging, visitor facilities, roads, and utilities near canyon walls, plateau margins, drainageways, or unstable slopes can increase the number and value of exposed assets. Road widening, cut-and-fill work, altered drainage, and increased visitor use may also place greater demands on constrained corridors. Countywide growth does not establish a uniform increase in hazard; local changes should be evaluated through land-use review, geotechnical investigation, and updated susceptibility and wildfire information.

IRON COUNTY

Iron County's vulnerability is concentrated where development and infrastructure intersect Cedar Canyon, Cedar Highlands, foothills, canyon mouths, drainage crossings, fill embankments, and other susceptible terrain serving Brian Head, Cedar City, Enoch, Paragonah, and Parowan. Recent events demonstrate active slope movement: in 2023, the Cedar Canyon MP8 complex developed a scarp nearly 1,000 feet wide with more than 50 feet of vertical displacement and a newly formed landslide of nearly 6 acres; UGS also documented movement at Cedar Highlands and along Right Hand Canyon Road.

Potentially vulnerable assets include State Route 14, Right Hand Canyon Road, foothill and canyon neighborhoods, bridges, culverts, drainage infrastructure, electric and communications lines, emergency routes, schools, public facilities, airport access, and recreation corridors. Structures and lots may be directly affected where they overlie or lie below unstable slopes, while facilities elsewhere may be indirectly affected by road or utility interruption. Countywide population, housing, school, and bridge totals are not used as direct-exposure estimates without a spatial overlay.

Likely impacts include displacement or cracking of roadbeds and pavement, repeated maintenance needs, debris deposition, damage to developed lots, and interruption of utilities and drainage. Closures may disrupt emergency response, school travel, access to public facilities, commuting, and recreation travel. Potential economic consequences include debris removal, monitoring, geotechnical investigation, slope stabilization, road and utility repair, property damage, and business interruption; available information does not support a countywide loss estimate.

Cascading impacts. Continued slope movement can repeatedly damage repaired roads and utilities, prolong closures, and increase maintenance costs. A closure in Cedar Canyon or another constrained route can delay emergency response and utility restoration, while blocked drainage may redirect runoff

and cause localized flooding or erosion. Damage to co-located power, communications, or water infrastructure can extend service disruption beyond the mapped landslide footprint.

Changes in development. Continued residential and infrastructure growth near Cedar City, Cedar Highlands, canyon mouths, and foothill settings can increase exposure where new assets intersect unstable slopes or runout areas. Grading, cut-and-fill construction, irrigation, leaking utilities, and drainage modification may alter local stability even where regional geologic probability is unchanged. Future reviews should use current UGS mapping, recent-event boundaries, geotechnical studies, and jurisdiction-confirmed development patterns to identify newly exposed areas.

KANE COUNTY

Kane County's vulnerability is concentrated along steep cliffs, narrow canyons, weak sedimentary units, alluvial fans, drainage crossings, and highway corridors serving Alton, Big Water, Glendale, Kanab, Orderville, and major visitor destinations. The June 6, 2023, Meadow Creek landslide near State Route 9 was documented at approximately 2 miles by 1.5 miles and demonstrates the scale of active movement that can affect a major community and visitor-access route. Intense rainfall, snowmelt, erosion, wildfire effects, and slope disturbance can contribute to future failures.

Potentially vulnerable assets include U.S. 89, State Route 9, local canyon roads, bridges, culverts, electric and communications lines, water and drainage infrastructure, emergency and health-care access, residences, lodging, campgrounds, and visitor facilities. Direct exposure is limited to assets on or below susceptible slopes and within runout or debris-flow paths, but indirect disruption can extend across the county because alternate routes are often lengthy or unavailable. Countywide population, household, housing, and visitor totals are therefore context rather than direct-exposure estimates.

Likely impacts include roadway displacement, rockfall or debris blockage, damage to drainage crossings and co-located utilities, structural damage or isolation, and restricted access to communities and recreation destinations. Consequences may include delayed emergency and medical access, extended detours, repair and stabilization costs, interrupted deliveries, and reduced visitor access and spending. The significance of an event depends on its location, movement rate, warning time, and the availability of alternate routes.

Cascading impacts. Closure of U.S. 89, State Route 9, or a local canyon road can affect residents, visitors, emergency services, freight, and utility restoration beyond the immediate failure area. Debris blocking culverts or channels can redirect flow and create secondary flooding or erosion, while damage to utilities sharing the corridor can cause power, communications, or water outages and prolong recovery.

Changes in development. New residential, tourism, and recreation development near cliffs, canyon mouths, drainageways, or alluvial fans may increase exposure even if the underlying geologic likelihood remains similar. Grading, road cuts, fill placement, irrigation, and drainage changes can modify local slope conditions, and increased visitor use can raise the number of people dependent on vulnerable routes. Jurisdiction-specific changes should be confirmed through local development review and incorporated into future exposure mapping.

WASHINGTON COUNTY

Washington County's vulnerability is concentrated where developed benches, foothills, incised drainages, canyon margins, and slope-modified terrain intersect rapidly growing communities and regional lifelines. Participating municipalities include Apple Valley, Enterprise, Hildale, Hurricane, Ivins, La Verkin, Leeds, New Harmony, Rockville, Santa Clara, Springdale, St. George, Toquerville, Virgin, and Washington City. The June 6, 2023, Truman Drive event in Santa Clara, documented at approximately 300 by 150 feet, demonstrates that active movement can occur within a developed setting.

Potentially vulnerable assets include residences on or below susceptible slopes; Interstate 15; State Routes 7, 9, 18, and 34; local roads; bridges and culverts; drainage systems; electric, communications, and water infrastructure; schools; medical and emergency facilities; airport access; and visitor and recreation corridors. Washington County has substantial population and building exposure overall, but countywide totals are not direct landslide-exposure estimates. Quantification requires current asset data overlaid with susceptibility, inventory, runout, and site-specific hazard information.

Likely impacts include damage to homes, lots, neighborhood streets, retaining structures, drainage facilities, and utilities in foothill or bench settings. Road or utility failures may interrupt access to schools, hospitals, emergency facilities, commercial areas, airport routes, and visitor destinations. Potential consequences include injury, property repair, temporary displacement, debris removal, slope stabilization, business interruption, traffic disruption, and delayed emergency response; available data do not support a countywide loss estimate.

Cascading impacts. Neighborhood or corridor closures may delay emergency response, school travel, commuting, deliveries, and utility repair. Damage to drainage systems can redirect runoff and create localized flooding or erosion, while failure of co-located water, power, or communications infrastructure can extend service interruptions. Impacts on State Route 9 or other visitor routes may also affect access and economic activity in gateway communities.

Changes in development. Continued population and housing growth expands the number and value of assets that may be placed on or below susceptible slopes, particularly along benches, foothills, canyon margins, and drainage corridors. Grading, cut-and-fill construction, retaining walls, irrigation, leaking utilities, and modified drainage can change site-specific stability and runoff. Growth should not be interpreted as a uniform increase in landslide probability, but it can increase exposure and consequences unless current geologic information and geotechnical review guide siting and design.

Problem Soils

"Problem soils" is a planning term for soils whose physical or chemical properties can constrain construction, infrastructure, agriculture, or water management. Relevant limitations may include shrink-swell potential, collapse upon wetting, salinity or sodicity, corrosivity, low bearing strength, shallow depth to bedrock, poor drainage, and erosion susceptibility. The USDA Natural Resources Conservation Service (NRCS) Web Soil Survey and Soil Survey Geographic Database (SSURGO) provide screening-level soil

properties and engineering interpretations. Site-specific geotechnical investigation remains necessary for engineering design because map units can contain multiple soil components and inclusions.

Types of Problem Soils in Southern Utah

In southern Utah, problem soils are closely tied to arid and semiarid weather conditions, sedimentary and volcanic parent materials, and historic lakebed and alluvial fan environments, which produce soils with high clay content, salinity, gypsum, or collapsible structure.[79] Across Beaver, Iron, Kane, Garfield, and Washington Counties, several types of problem soils are present due to the region's arid weather, geologic history, and dominant soil parent materials.

- **Expansive Soils:** One of the most significant soil concerns is the presence of expansive (shrink-swell) soils. These soils contain clay minerals, most commonly montmorillonite, that expand when wet and shrink when dry. This repeated volume change causes ground movement that can damage building foundations, pavements, pipelines, and concrete slabs. Expansive soils are widespread in areas underlain by fine-grained sedimentary formations and clay-rich alluvial deposits. In Washington County, expansive soils are a well-documented contributor to foundation cracking and infrastructure distress, especially in rapidly developing areas where clay-rich Aridisols are common.
- **Saline and Sodic Soils:** These soils are also prevalent across the five-county area and contain elevated concentrations of soluble salts or sodium, which reduce soil strength, impede drainage, and accelerate corrosion of concrete and metal infrastructure. Saline and sodic conditions are most commonly found in valley bottoms, playas, and areas influenced by ancient lakebeds or strong evaporative processes. Throughout southern Utah, saline and alkaline soils are characteristic of Aridisols, where limited precipitation prevents the natural leaching of salts from the soil profile, allowing them to accumulate near the surface.[80]
- **Collapsible Soils:** These soils are typically composed of loosely packed silt and fine sand that appear stable under dry conditions but undergo sudden settlement when wetted. Collapsible soils pose serious risks to foundations, roadways, and buried utilities and are commonly associated with alluvial fan deposits, wind-deposited sediments, and volcanic ash layers. These soils are particularly problematic in areas undergoing urban expansion, where irrigation practices, landscaping, or leaking utilities introduce moisture into soil profiles that historically remain dry.[81]

[79] Utah State University Extension, "Soils of Utah," https://extension.usu.edu/rangelands/files/RRU_Section_Six.pdf; U.S. Department of Agriculture, Natural Resources Conservation Service, "Soil Survey of Iron-Washington Area, Utah, Parts of Iron, Kane, and Washington Counties." archived USDA publication Accessed April 8, 2026, https://ia801605.us.archive.org/4/items/usda-soil-survey-of-iron-washington-area-utah/usda-soil-survey-of-iron-washington-area-utah.pdf.

[80] Utah State University Extension, "Soils of Utah," https://extension.usu.edu/rangelands/files/RRU_Section_Six.pdf; NOAA Office for Coastal Management Digital Coast, "Soil Survey Geographic Database," https://coast.noaa.gov/digitalcoast/data/ssurgo.html.

[81] U.S. Department of Agriculture, Natural Resources Conservation Service, "Soil Survey of Iron-Washington Area, Utah, Parts of Iron, Kane, and Washington Counties." archived USDA publication Accessed April 8, 2026, https://ia801605.us.archive.org/4/items/usda-soil-survey-of-iron-washington-area-utah/usda-soil-survey-of-iron-washington-area-utah.pdf; Utah State University Extension, "Soils of Utah," https://extension.usu.edu/rangelands/files/RRU_Section_Six.pdf.

- **Gypsiferous Soils:** These soils represent another category of problem soils within the Colorado Plateau region. These soils contain high concentrations of gypsum, a mineral that dissolves readily when exposed to water. Dissolution of gypsum can lead to loss of soil strength, subsidence, and the development of sinkhole-like features. Gypsum-rich soils create challenges for road construction, building foundations, and septic system performance due to their solubility and variable bearing capacity.
- **Shallow, Rocky, and Erodible Soils:** In upland and canyon environments throughout all five counties, shallow, rocky, and highly erodible soils are common. These soils often occur directly over bedrock and may contain large amounts of rock fragments, which limit excavation and reduce their suitability for septic systems and other subsurface infrastructure. These soils are also highly susceptible to erosion and slope instability, particularly following wildfires or intense rainfall events. These conditions are especially widespread in areas with steep terrain and thin soil cover.

Location

Problem-soil conditions are not randomly distributed. They reflect mapped soil components, parent material, landforms, drainage, slope, and geologic setting and may vary substantially within a soil map unit or development site. Countywide screening should therefore use current SSURGO properties and engineering interpretations and should be supplemented by site-specific geotechnical investigation for design decisions.

Figure 32 through Figure 36 depict broad NRCS soil orders. Soil order is a taxonomic classification and does not, by itself, establish shrink-swell potential, collapse potential, corrosivity, salinity, bearing strength, erodibility, or other engineering limitations. Property-specific SSURGO/Web Soil Survey interpretations are needed to establish the location and extent of individual soil limitations.

BEAVER COUNTY

Problem soils are mainly found in closed basins, on valley floors, and in areas shaped by volcanic and alluvial processes. Playa environments and low-lying valleys commonly contain saline and sodic soils, where evaporation exceeds precipitation, and salts accumulate near the ground surface. Collapsible soils occur in broad alluvial fans and in deposits influenced by volcanic ash, particularly near the community of Beaver and surrounding agricultural areas, where these soils may settle rapidly when exposed to moisture. Gypsiferous and weakly cemented soils are present locally where sedimentary units are exposed at or near the surface. In upland areas, shallow soils over volcanic bedrock are widespread, limiting development opportunities outside valley bottoms because of limited soil depth and excavation challenges.

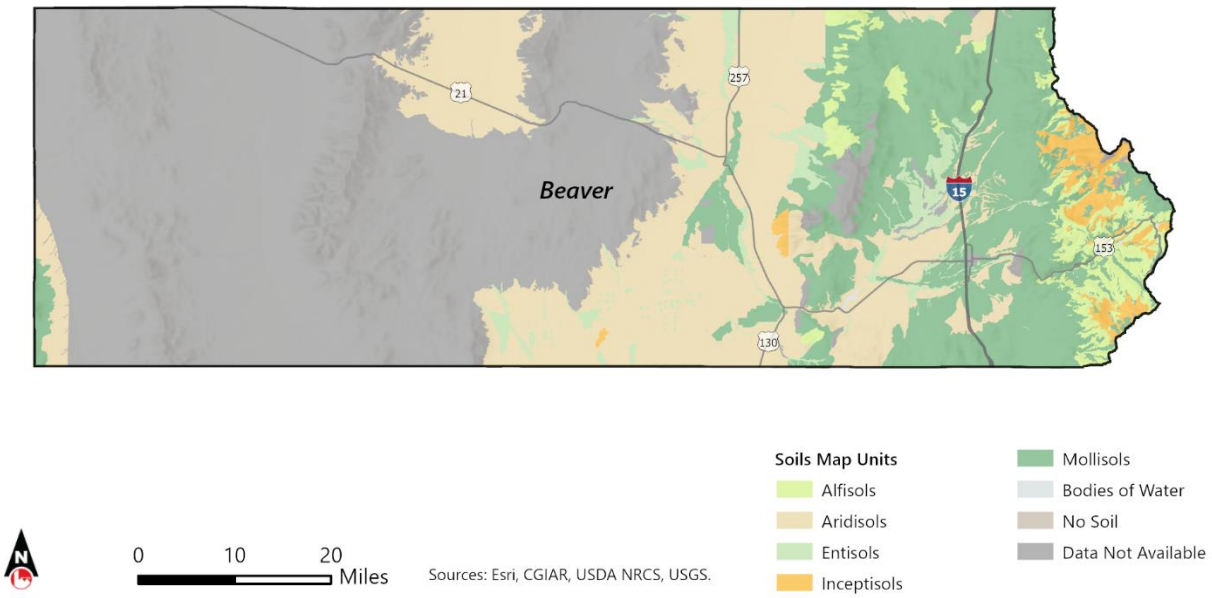


Figure 32: Beaver County Soils Classification Map

GARFIELD COUNTY

Problem-soil conditions reflect the county's Colorado Plateau geology and rugged terrain. Gypsiferous soils are widespread throughout the county, especially in areas underlain by gypsum-bearing sedimentary formations east of Bryce Canyon and within lower-elevation basins. Shallow, rocky, and highly erodible soils dominate canyon rims, plateaus, and steep slopes, limiting opportunities for construction and infrastructure placement. Saline soils occur in valley bottoms and localized depressions where drainage is restricted. Due to thin soil cover and steep slopes, erosion and slope instability are common concerns, especially following land disturbance or periods of intense rainfall.

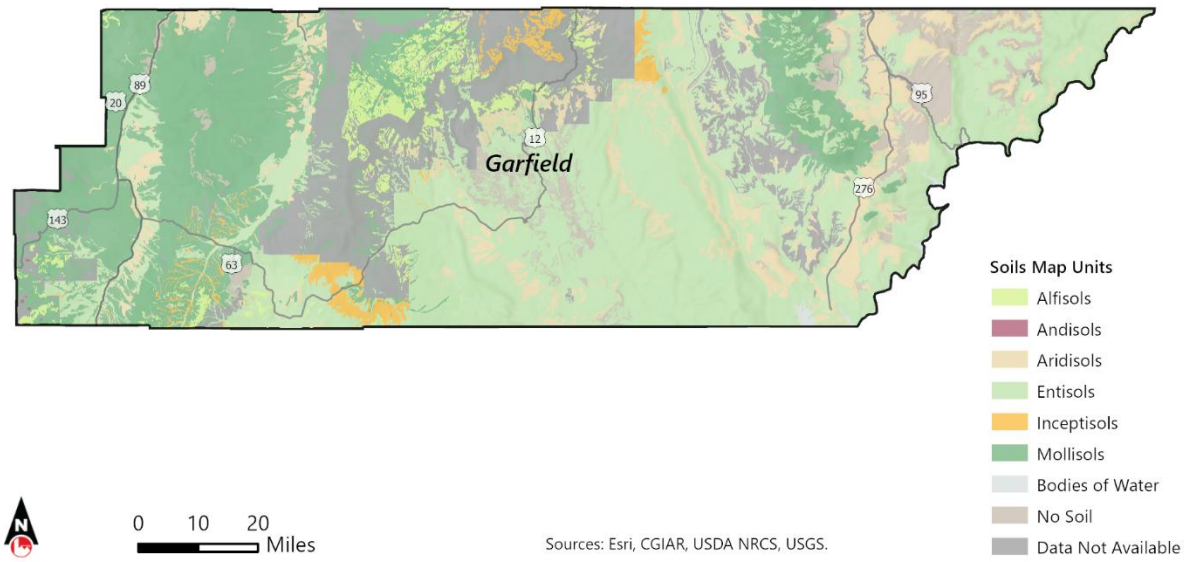


Figure 33: Garfield County Soils Classification Map

IRON COUNTY

Utah Geological Survey studies document collapsible-soil hazards in Cedar Valley, including developed areas of Cedar City and Enoch. Wetting of susceptible soils can cause settlement and damage structures or infrastructure. The occurrence and severity of other soil limitations depend on site materials and conditions; current NRCS Web Soil Survey information and site-specific geotechnical investigation are needed to evaluate those limitations.[82]

[82] Utah Geological Survey, Utah Geological Survey Releases Geologic Hazard Studies for Bryce Canyon and Cedar Valley, May 5, 2026, Cedar Valley study discussion; Collapsible Soil Hazard Map for the Cedar City, Utah Area, Contract Report 91-10, 1991, https://geology.utah.gov/utah-geological-survey-releases-geologic-hazard-studies-for-bryce-canyon-and-cedar-valley/; https://ugspub.nr.utah.gov/publications/contract_reports/cr-91-10.pdf. These sources establish local collapsible-soil concerns, not countywide engineering-property prevalence.

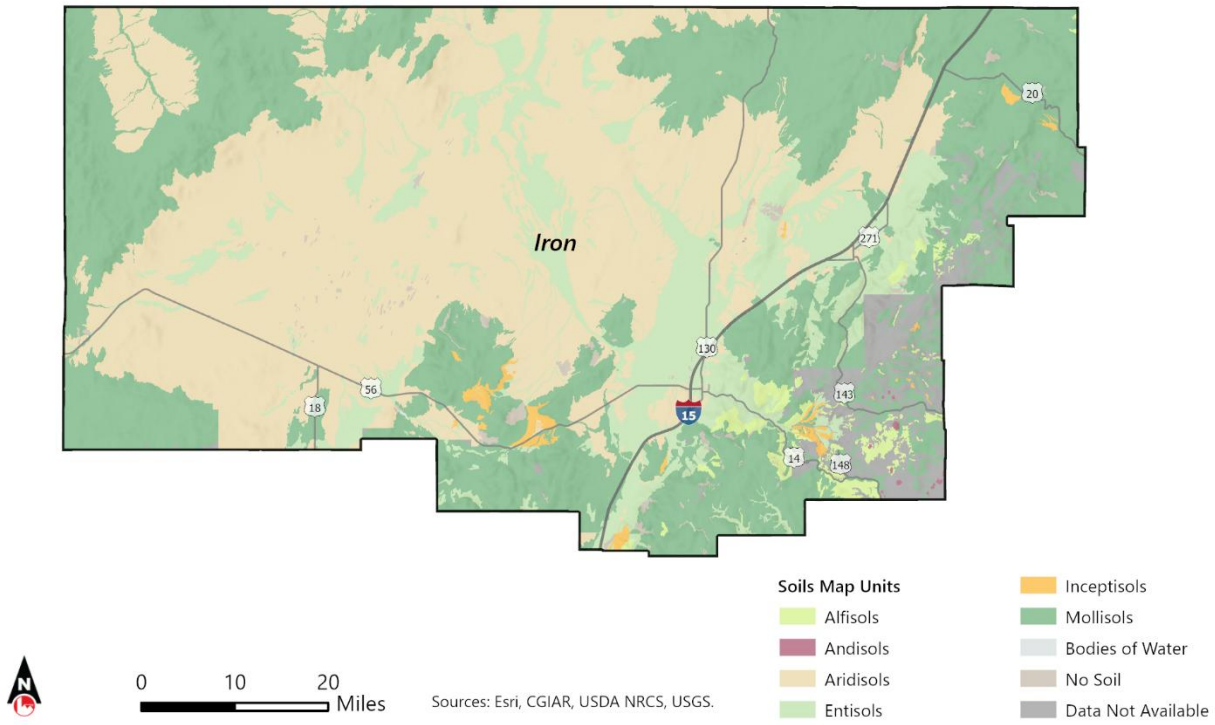


Figure 34: Iron County Soils Classification Map

KANE COUNTY

Problem soils tend to occur in distinct geographic settings tied to the county's valleys, alluvial plains, and underlying sedimentary geology. Valley floors and low-lying alluvial areas contain expansive and saline soils, particularly in and around the City of Kanab, adjacent to agricultural lands, and along Kanab Creek, where fine-grained alluvial sediments have accumulated. Gypsiferous soils are widespread across the Colorado Plateau portion of the county, especially in areas east and north of Kanab, where gypsum-rich sedimentary formations are exposed at or near the surface. In contrast, upland and canyon environments throughout the Grand Staircase–Escalante region are dominated by shallow, rocky soils with limited bedrock depth. These soils have a high erosion potential and constrain development due to excavation limitations and slope instability concerns.

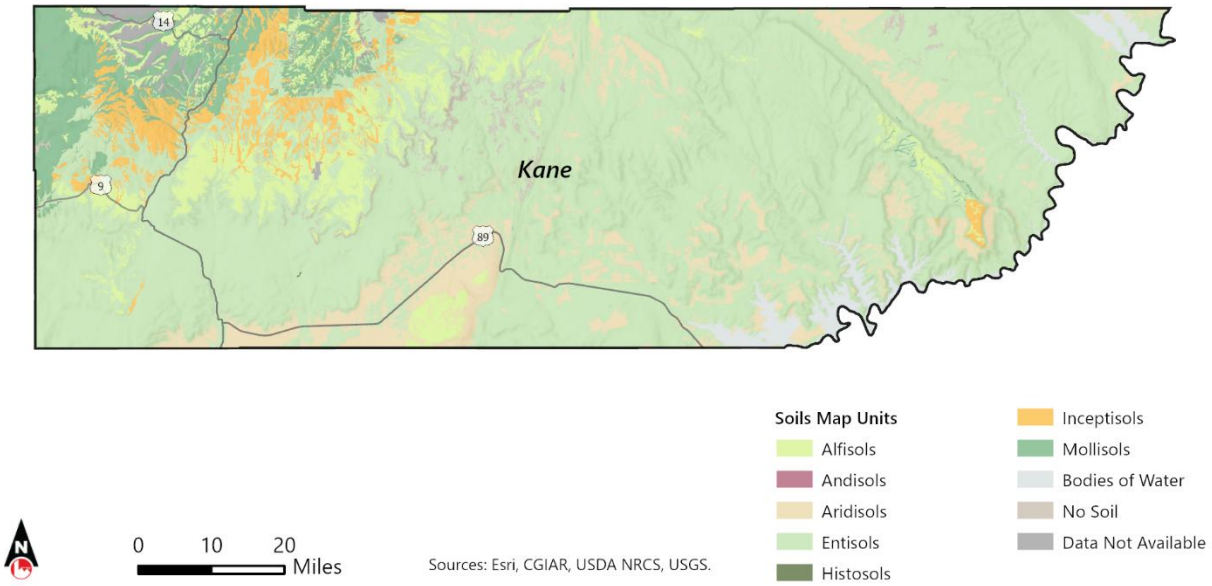


Figure 35: Kane County Soils Classification Map

WASHINGTON COUNTY

Some of the most extensively documented problem soils in southern Utah can be found in the county, largely due to rapid population growth and development. Expansive clay soils are widespread throughout the urban corridor, particularly in and around St. George, Washington City, Hurricane, and Ivins, where clay-rich Aridisols underlie much of the developed landscape. Collapsible soils are also common in alluvial-fan and wind-deposited sediments along valley margins and in expanding residential areas, where wetting can trigger settlement. Saline soils occur on lower terraces and historic floodplains, while shallow, rocky soils dominate the foothills and uplands surrounding the urban core. Collectively, these soil conditions can change markedly over short distances, increasing the risk to development in Washington County without site-specific geotechnical investigation.

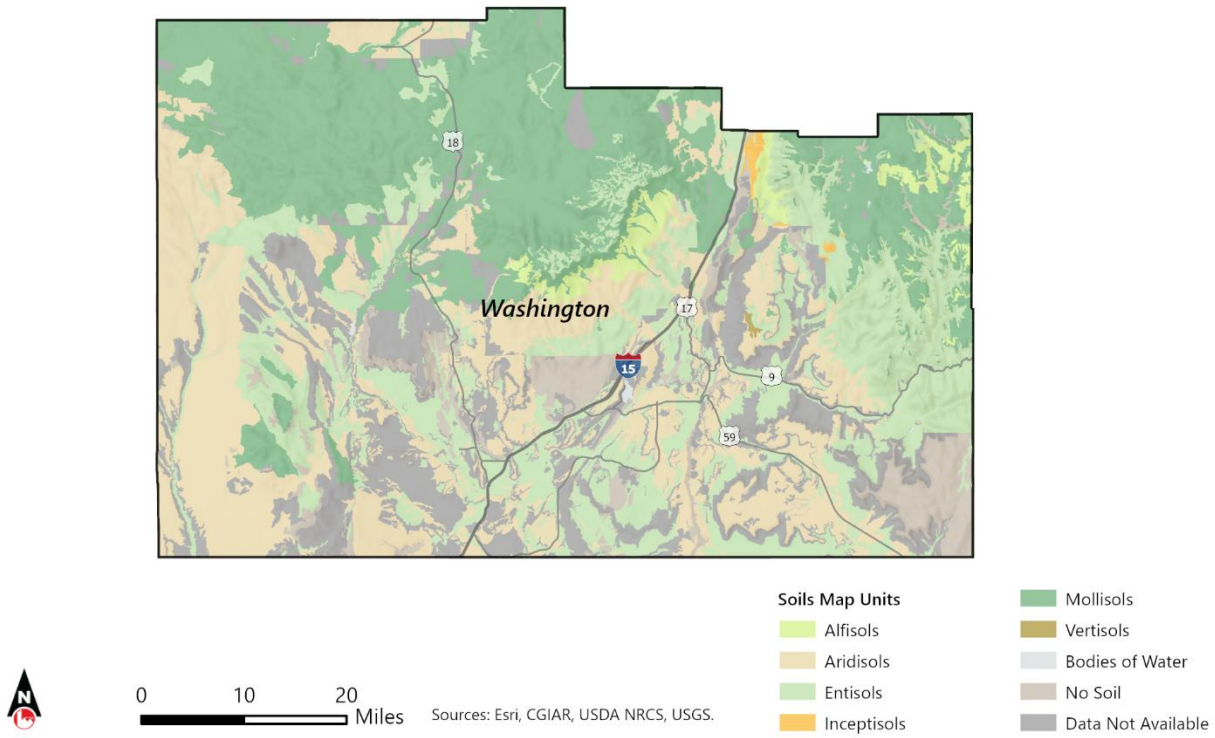


Figure 36: Washington County Soils Classification Map

Magnitude and Extent

Problem-soil extent varies by soil property, mapped component, depth, and landscape position. The available soil-order maps provide regional context but do not quantify the location or extent of individual engineering limitations. Accordingly, this profile characterizes extent qualitatively and does not assign county acreage or percentages without a reproducible SSURGO-based analysis.

Table 32 presents Expansion Index classifications for expansive soils under specified laboratory test conditions.

Table 32: Classification of Potential Expansion of Soils Using Expansion Index (EI)[83]

Potential Expansion	Expansion Index (EI)
Very Low	0–20
Low	21–50
Medium	51–90
High	91–130

[83] ASTM International, "Standard Test Method for Expansion Index of Soils-ASTM D4829-11," 2011 (historical edition), accessed October 9, 2026, https://store.astm.org/d4829-11.html.

Potential Expansion	Expansion Index (EI)
Very High	>130

Table 32 classifies expansive-soil potential, not impact intensity or event magnitude. Higher Expansion Index values indicate greater potential for expansion under the test conditions, but the severity of damage also depends on soil thickness, moisture change, foundation and pavement design, drainage, construction quality, and maintenance. Other problem-soil conditions require separate indicators, such as electrical conductivity or salinity class, sodium-related ratings, collapse potential, gypsum content or dissolution susceptibility, corrosion ratings, depth to a restrictive layer, and erosion hazard. Where those measures are unavailable, the plan identifies potential concern areas without assigning a quantitative extent rating.

Previous Occurrences

No comprehensive, consistently maintained regional inventory of problem-soil damage was available for this update. Problem soils are persistent site conditions rather than discrete incidents, and damage may be recorded through building, public works, utility, permitting, geotechnical, or maintenance records rather than disaster databases. In the absence of a verified regional inventory, this profile does not assign dates, losses, injuries, or fatalities to specific problem-soil occurrences.

FEDERAL DECLARATIONS

FEMA disaster declarations do not use "problem soils" as a standard incident type. Soil-related damage may occur as a secondary effect of flooding, severe storms, earthquakes, landslides, or subsidence; therefore, the absence of a declaration titled for problem soils does not demonstrate that soil-related impacts have not occurred.

STATE DECLARATIONS

No verified state proclamation, executive order, or declaration specifically identifying problem soils was available for inclusion. This statement is limited to declarations specifically titled for the condition and does not exclude soil-related impacts associated with another declared hazard.

Probability of Future Occurrences

Problem soils, including expansive, collapsible, saline, gypsiferous, and shallow soils, are expected to continue affecting the Five County AOG planning area due to the region's arid-to-semiarid weather, geologic conditions, soil composition, and ongoing land development patterns. Historical documentation and geologic mapping confirm that problem-soil conditions are widespread across all five counties, particularly in valley bottoms, alluvial fans, basin margins, and areas underlain by clay-rich or gypsum-bearing formations. These documented conditions demonstrate that problem soils are not isolated or unusual, but rather a continuing regional hazard closely tied to landscape position, geology, and moisture

variability. Because problem soils are persistent conditions, an event-recurrence probability is not assigned. Damaging manifestations are possible when susceptible soils coincide with moisture change, loading, excavation, inadequate drainage, or development. The likelihood of damage therefore varies by site and by the effectiveness of investigation, design, construction, and maintenance practices.

Future problem-soil risk may increase where weather variability, land-use change, or population growth increases exposure or changes soil moisture conditions. Long-term projections for southern Utah indicate increased precipitation variability, including longer dry periods punctuated by higher-intensity storm events, which may affect shrink-swell cycles and soil collapse where susceptible soils and site conditions coincide.[84] Population growth, particularly in Washington, Iron, and Kane Counties, is expected to drive continued residential, commercial, and infrastructure development into areas with known soil limitations, including valley margins and alluvial fan environments. Even in more rural counties such as Beaver and Garfield, continued dependence on limited transportation corridors and utility systems through problem-soil areas sustains vulnerability to soil-related damage.

Problem-soil conditions persist; the following factors influence the potential for damaging manifestations:

- Extensive areas of problem soils
- Seasonal precipitation, irrigation, and other moisture fluctuations that activate soil movement and affect wet-dry cycles
- Ongoing and projected development in valley floors, alluvial fans, and basin margins
- Continued exposure of transportation routes, utilities, residential structures, and other critical infrastructure to problem-soil conditions

Factors such as continued population growth, expanding development into geologically constrained areas, and increasing moisture variability may increase future problem-soil risk by expanding the number and concentration of people, structures, and infrastructure exposed to adverse soil conditions. As development and land use continue across county lands, potential property damage, infrastructure repair costs, and social and economic impacts related to problem soils may rise accordingly.

Future risk is expected to be driven primarily by changes in exposure, including development and infrastructure investment in areas with soil limitations. Moisture variability may affect shrink-swell, collapse, erosion, and gypsum-dissolution processes, but the direction and magnitude of change at a specific site cannot be determined without local soil, drainage, and climate information.

Vulnerability Assessment

Southwestern Utah's vulnerability to problem soils is shaped by its arid climate, complex geology, and development concentrated in valley floors, alluvial fans, basin margins, and plateau communities. Expansive, collapsible, saline, sodic, shallow, rocky, erodible, and locally gypsiferous soils can damage

[84] Utah Division of Emergency Management, "Climate Change," https://hazards.utah.gov/wp-content/uploads/Utah-SHMP-Ch12-Climate-Change-1.pdf.

buildings, roads, utilities, agricultural facilities, and critical infrastructure through settlement, shrink-swell movement, erosion, corrosion, reduced bearing capacity, and drainage limitations. Because these are persistent site conditions rather than discrete incidents, vulnerability depends on the coincidence of susceptible soils with exposed assets, moisture change, loading, excavation, drainage, design, construction, and maintenance practices.

BEAVER COUNTY

Beaver County's vulnerability is concentrated in valley bottoms, closed basins, and alluvial settings where saline, sodic, collapsible, shallow, and locally expansive soils overlap with Beaver, Milford, Minersville, agricultural areas, and connecting transportation and utility corridors. Although population and building density are comparatively low, dispersed settlement, long travel distances, and limited infrastructure redundancy can make localized failures consequential.

Homes, older buildings, schools, emergency facilities, local roads, bridge approaches, culverts, water and wastewater lines, septic systems, canals, laterals, corrals, barns, and equipment pads may experience foundation or slab cracking, uneven settlement, pavement distress, corrosion, drainage problems, pipe failure, or reduced agricultural productivity. Irrigation, stormwater infiltration, leaking pipes, and changing groundwater conditions can introduce moisture into collapsible or shrink-swell soils and worsen damage.

The most significant effects are likely to be recurring repair and maintenance costs rather than a single catastrophic loss. Older structures and infrastructure may be more susceptible where they predate modern geotechnical investigation, foundation design, drainage standards, or soil treatment. Vulnerable residents may be affected indirectly through housing damage, service interruptions, travel limitations, and increased repair costs.

Cascading impacts. Road settlement or foundation distress can restrict emergency response, school transportation, agricultural operations, and daily travel where alternate routes are limited. Breaks in water, wastewater, irrigation, or other buried utilities can interrupt service and saturate moisture-sensitive soils, producing additional settlement or instability; repeated repairs can also strain local budgets and divert funds from other capital and mitigation priorities.

Changes in development. Future exposure may increase where new homes, agricultural facilities, utilities, or transportation improvements extend across valley-floor and alluvial-fan soils. Even modest growth can add assets to constrained locations; applying current SSURGO screening, site-specific geotechnical investigation, moisture controls, and appropriate foundation and pavement design can limit the increase in vulnerability.

GARFIELD COUNTY

Garfield County's vulnerability reflects rugged terrain, dispersed communities, and widespread shallow, rocky, erodible, saline, and gypsiferous soils in plateau, canyon, basin, and valley settings. Communities such as Panguitch, Escalante, Boulder, Tropic, Cannonville, Henrieville, and Hatch, together with highways

and remote service corridors, have limited alternate access and may be affected even when soil-related damage is localized.

Homes, schools, emergency facilities, scenic byways, local roads, bridge approaches, culverts, water and wastewater systems, septic systems, campgrounds, visitor facilities, utilities, and agricultural infrastructure may experience foundation movement, erosion, washouts, settlement, corrosion, septic limitations, or loss of bearing capacity. Gypsum dissolution is an additional concern where water reaches susceptible materials, while shallow bedrock and steep slopes increase excavation and stabilization costs.

Tourism and recreation assets are important exposure considerations because access roads, campgrounds, and visitor-serving facilities often occupy constrained terrain. Agricultural lands may face salinity, drainage, and erosion problems that affect productivity and damage canals, ditches, pads, and farm roads. Older or remote infrastructure may be especially vulnerable where geotechnical data, drainage improvements, or maintenance access are limited.

Cascading impacts. Erosion, roadway settlement, culvert failure, or slope-adjacent soil instability can delay emergency response, school travel, deliveries, and visitor access between small communities and essential services. Utility or septic failures can interrupt basic services and add water to sensitive soils, while damage to recreation access can reduce seasonal revenue and extend recovery because repair resources are distant.

Changes in development. New housing, tourism facilities, utilities, and transportation improvements may increase exposure where construction extends into shallow, steep, erodible, or gypsum-bearing terrain. Growth may remain limited in scale, but site constraints can raise per-project costs and long-term maintenance obligations; early geotechnical screening, drainage design, erosion control, and careful siting are therefore important.

IRON COUNTY

Iron County has elevated vulnerability because rapid growth and concentrated development overlap with documented collapsible-soil hazards in Cedar Valley and other site-specific limitations in valley and alluvial-fan settings. Exposure is greatest in Cedar City, Enoch, Parowan, Paragonah, and developed portions of Cedar and Parowan Valleys, where homes, schools, businesses, roads, utilities, and public facilities occupy basin fill and variable alluvial deposits.

Residential subdivisions, commercial buildings, schools, critical facilities, roads, sidewalks, bridge approaches, water and wastewater lines, storm drainage, septic systems, irrigation works, and agricultural facilities may experience settlement, shrink-swell movement, cracking, corrosion, erosion, or reduced bearing capacity. Irrigation, leaking utilities, shallow groundwater, stormwater infiltration, and wet-dry cycles can activate moisture-sensitive soils and increase cumulative damage.

Because the county has a comparatively large and concentrated built environment, localized failures can affect many residents and impose substantial cumulative costs. Newer growth areas on alluvial fans or basin margins may encounter soil conditions that vary over short distances, while older buildings and

infrastructure may lack modern geotechnical design or moisture-control measures. Indirect effects can include housing damage, utility interruptions, travel delays, and disruption to schools or essential services.

Cascading impacts. Foundation distress, pavement settlement, or utility failure can interrupt access to homes, schools, medical services, businesses, and emergency facilities. Water, sewer, storm-drainage, or irrigation leaks can saturate collapsible or expansive soils and worsen damage; repeated repairs can affect business continuity, agriculture, municipal budgets, and the reliability of rapidly expanding service systems.

Changes in development. Continued residential, commercial, and infrastructure expansion around Cedar City, Enoch, and other valley communities is likely to increase the number and value of exposed assets. Extending roads and utilities into alluvial-fan and basin-margin settings can create long-lived maintenance obligations unless site-specific investigation, engineered foundations, drainage controls, construction inspection, and disclosure of soil limitations are incorporated early.

KANE COUNTY

Kane County's vulnerability is shaped by valley-floor development, dispersed rural communities, tourism infrastructure, and expansive, saline, gypsiferous, shallow, rocky, erodible, and locally collapsible soils. Exposure is concentrated in and around Kanab, Orderville, Alton, Glendale, Big Water, agricultural valleys, and transportation and utility corridors serving remote recreation destinations.

Homes, schools, lodging, emergency facilities, roads, bridge approaches, culverts, water and wastewater systems, septic systems, campgrounds, park access roads, utilities, and agricultural facilities may experience cracking, settlement, erosion, corrosion, drainage limitations, or localized loss of bearing capacity. Irrigation, leaks, stormwater infiltration, intense rainfall, and wet-dry cycles can activate expansive, collapsible, or gypsiferous soils.

Transportation and utility systems are particularly important because they connect widely separated communities, public lands, visitor destinations, and essential services with limited redundancy. Older structures may lack current geotechnical design, and agricultural lands may experience salinity, drainage, and erosion problems that affect productivity and damage canals, ditches, pads, and access roads.

Cascading impacts. Road distortion, erosion, or culvert failure can delay emergency response, school transportation, agricultural activity, and visitor movement. Water, wastewater, septic, or utility failures can interrupt basic services and introduce moisture that worsens soil instability; damage to park access, campgrounds, or lodging areas can also reduce tourism activity and seasonal revenue.

Changes in development. Growth around Kanab and other valley communities, together with continued visitor demand, may place additional structures and infrastructure on fine-grained alluvium, plateau margins, and gypsum-bearing formations. Careful siting, geotechnical investigation, engineered foundations, drainage and erosion controls, and realistic maintenance planning can reduce the vulnerability added by new development.

WASHINGTON COUNTY

Washington County has the region's greatest concentration of exposure because rapid population growth and extensive urban and suburban development overlap with expansive, collapsible, saline, shallow, erodible, and locally gypsiferous soils. Vulnerability is greatest in the St. George–Hurricane corridor and communities including Washington City, Santa Clara, Ivins, La Verkin, and Toquerville, where development occupies alluvial fans, floodplain terraces, and basin margins with variable soil properties.

Residential subdivisions, multifamily housing, schools, hospitals, emergency facilities, commercial centers, roads, bridge approaches, sidewalks, retaining walls, storm drainage, water and wastewater systems, irrigation works, parks, and utility corridors may experience foundation movement, cracking, settlement, pavement distress, corrosion, erosion, or service-line failure. Landscaping, irrigation, stormwater infiltration, leaks, shallow groundwater, and pronounced wet-dry cycles can intensify these effects.

The density and value of exposed assets mean that localized soil-related damage can affect many people and produce substantial cumulative economic losses. Healthcare, education, commerce, tourism, and public safety may be indirectly affected when access or utilities fail. Older infrastructure may lack modern moisture controls, while new development may encounter sharply changing conditions over short distances.

Cascading impacts. Foundation movement, road settlement, or buried-utility failure can interrupt access to homes, schools, hospitals, businesses, and emergency facilities. Leaking water, wastewater, storm-drainage, or irrigation systems can worsen settlement or heave by saturating susceptible soils, and repeated repairs can strain public, district, business, and household budgets while disrupting commerce and essential services.

Changes in development. Continued expansion along the urban corridor is likely to increase both the number and value of assets exposed to problem soils, particularly on alluvial fans and valley margins. Avoidance where feasible, property-specific geotechnical investigation, engineered foundations and pavements, soil treatment, drainage and irrigation controls, construction quality assurance, and long-term maintenance can reduce the vulnerability created by future development.

Radon Gas

Radon is a naturally occurring, colorless, odorless, and tasteless radioactive gas produced by the radioactive decay of uranium found in soil, rock, and groundwater. As uranium breaks down, it forms radium, which further decays into radon gas. Because uranium is present in varying concentrations throughout Earth's crust, radon occurs nationwide and can affect urban, rural, and Tribal areas alike. Radon gas moves upward through soil and rock fractures and can enter buildings through cracks in foundations, floor drains, sump pumps, construction joints, and other openings, where it can accumulate

to elevated levels, particularly in enclosed or poorly ventilated spaces such as basements and crawlspaces.[85]

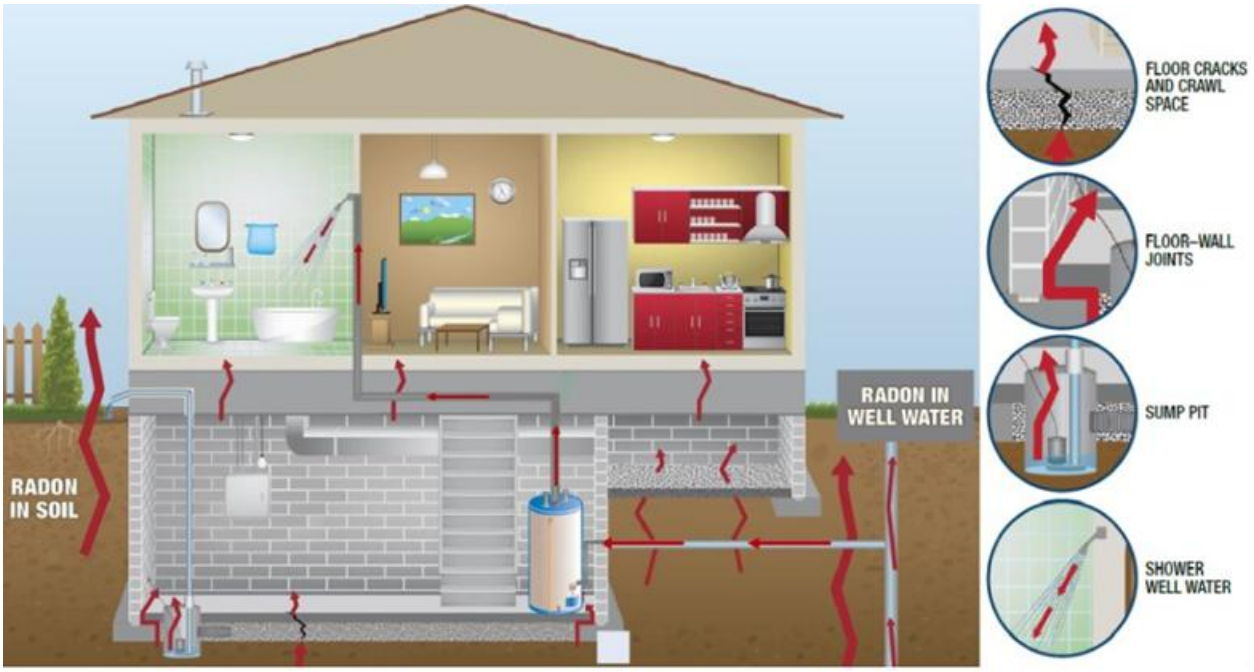


Figure 37: How Radon Enters Homes and Buildings[86]

When inhaled, radon and its radioactive decay products emit ionizing radiation that can damage lung tissue. Long-term exposure to elevated indoor radon concentrations significantly increases the risk of lung cancer. Radon is the second leading cause of lung cancer in the United States and the leading cause of lung cancer among nonsmokers. The U.S. Environmental Protection Agency (EPA) estimates that radon exposure is responsible for roughly 21,000 lung cancer deaths each year nationwide. There is no known safe level of radon exposure, and health risk increases with radon concentration and duration of exposure.

Radon levels vary widely due to differences in local geology, soil permeability, building construction, and ventilation.[87] Elevated radon concentrations have been documented in every state, including areas not traditionally associated with high radon potential. Because radon is undetectable by human senses, testing is the only way to determine indoor radon levels. The EPA recommends mitigation actions for buildings with radon concentrations at or above 4 picocuries per liter (pCi/L) of air.[88]

[85] U.S. Environmental Protection Agency, "Radon," 2026, https://www.epa.gov/radon.
[86] Adapted from Conference of Radiation Control Program Directors, Reducing the Risk from Radon: Information and Interventions—A Guide for Health Care Providers, Publication E-18-2, 2018, p. 2. https://crcpd.org/wp-content/uploads/2023/12/E-18-2HealthCareProfessionalsGuide_Radon_2018.pdf.
[87] U.S. Environmental Protection Agency, "Where Does Radon Come From?" 2026, https://www.epa.gov/radon/where-does-radon-come.
[88] U.S. Environmental Protection Agency, "Radon Risks and Solutions," 2026, https://www.epa.gov/radon/radon-risks-and-solutions.

Location

The five-county region features a diverse range of geologic, topographic, and climatic conditions that influence radon potential. This region spans the Basin and Range Province and the Colorado Plateau, both of which contain rock types and soil formations that can naturally produce radon gas. Many areas within the region contain sedimentary and volcanic rock formations, fractured bedrock, and permeable soils, which can allow radon to move upward and enter homes and buildings.

The region includes rural communities, small towns, and growing urban centers. Indoor radon potential cannot be inferred from development patterns or the availability of prior tests; each occupied building requires testing to establish its radon concentration. Elevation varies across the region, from lower desert valleys to higher plateaus and mountainous terrain, contributing to localized differences in radon potential. In addition, seasonal temperature changes and building ventilation patterns can affect indoor radon concentrations, especially during colder months when buildings are more tightly sealed.

Radon concentration in air is expressed in picocuries per liter (pCi/L). Figure 38 is reproduced from the 2019 Utah State Hazard Mitigation Plan and provides historical screening information. Because the underlying test period, sample size, geographic aggregation, and representativeness are not documented in this section, the figure is not used to quantify current county exposure or vulnerability.

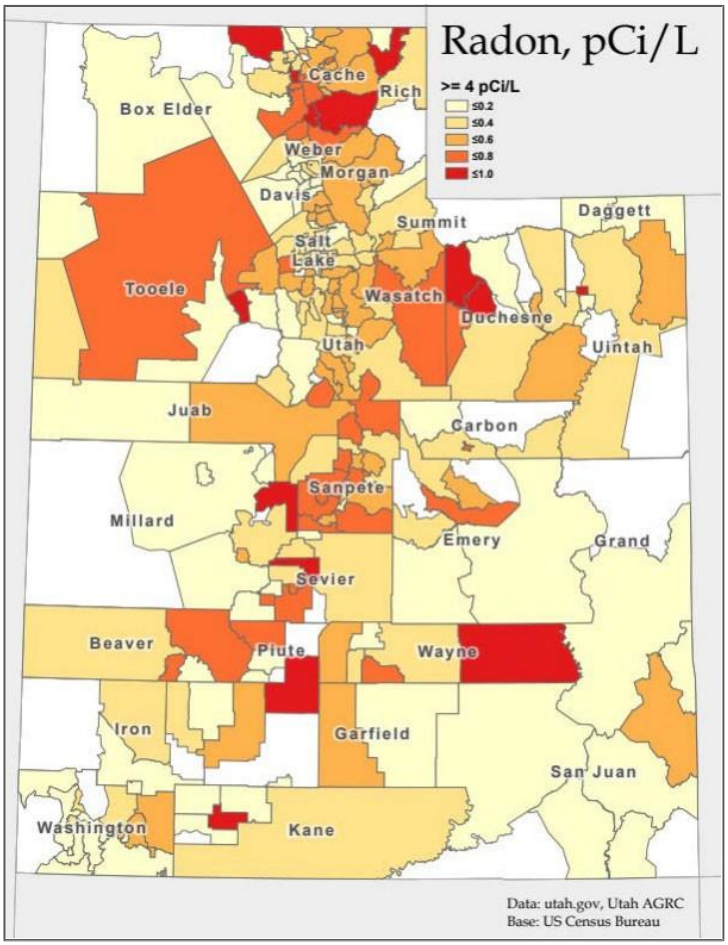


Figure 38: Radon, pCi/L Range of Magnitude by County, Utah[89]

The 2024 Utah State Enhanced Hazard Mitigation Plan summarizes how radon was ranked in local mitigation plans. In the reproduced map, Beaver County is shown as Moderate and Garfield, Iron, Kane, and Washington Counties are shown as Low. This map represents local-plan hazard rankings rather than measured indoor radon concentrations; therefore, it should not be used as a substitute for current testing data (see Figure 39).

[89]Utah Division of Emergency Management, 2019 Utah State Hazard Mitigation Plan, Chapter 8, Map 16, "Radon, pCi," https://hazards.utah.gov/wp-content/uploads/Utah-SHMP-Ch8-Geologic-Hazards.pdf.

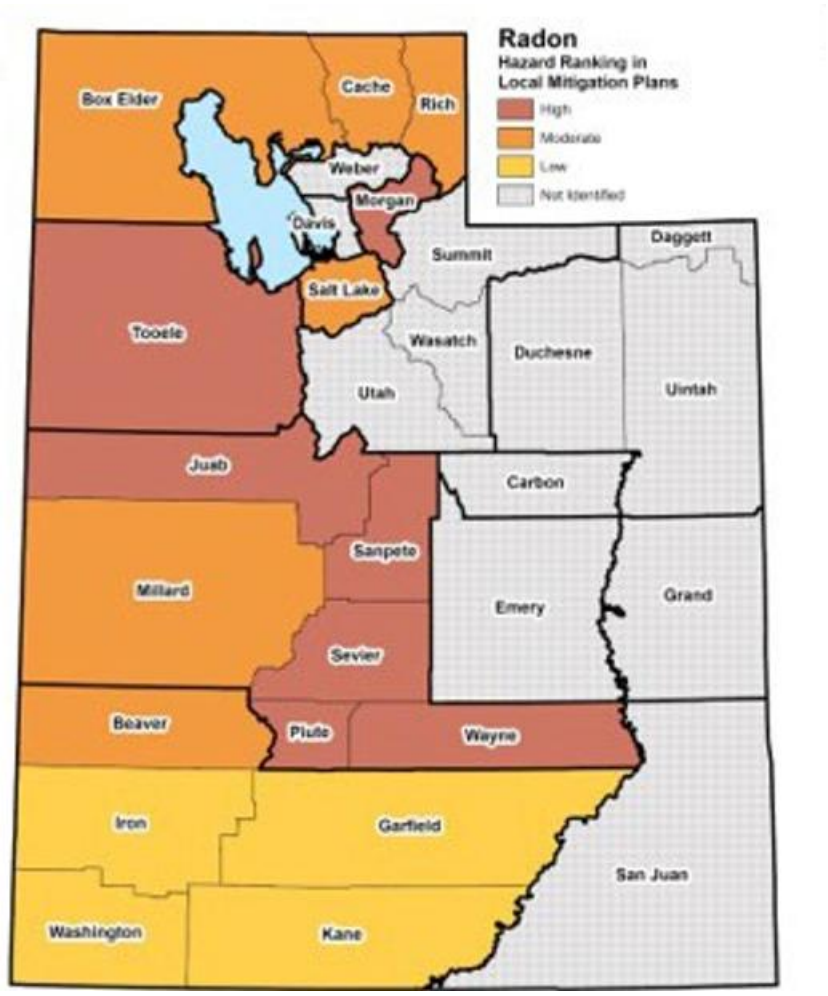


Figure 39: Radon Geological Hazard Ranking in Local Mitigation Plans, Map by County[90]

The EPA Map of Radon Zones classifies all five counties as Zone 2, meaning the predicted average indoor screening level is between 2 and 4 pCi/L. EPA zones were developed to identify areas with the potential for elevated indoor radon and do not predict the concentration in an individual building. EPA recommends fixing homes at or above 4 pCi/L and considering corrective action between 2 and 4 pCi/L because no known level of radon exposure is risk-free. Testing is necessary to characterize each building.

Figure 40 displays reported counts of pre-mitigation radon tests by county for the cited query. It does not show measured concentration, the percentage of tests at or above 4 pCi/L, or the number of untested buildings. Because testing is voluntary and the map does not provide a population-based sample, it is used only to describe the availability and geographic distribution of reported tests and not to estimate countywide prevalence.

[90]Utah Division of Emergency Management, 2024 Utah Enhanced State Hazard Mitigation Plan, Section 4.10.8, Table 4-63 and Figure 4-92 (local-plan radon significance rankings). https://hazards.utah.gov/wp-content/uploads/GeologicHazardChapterHMP.pdf.

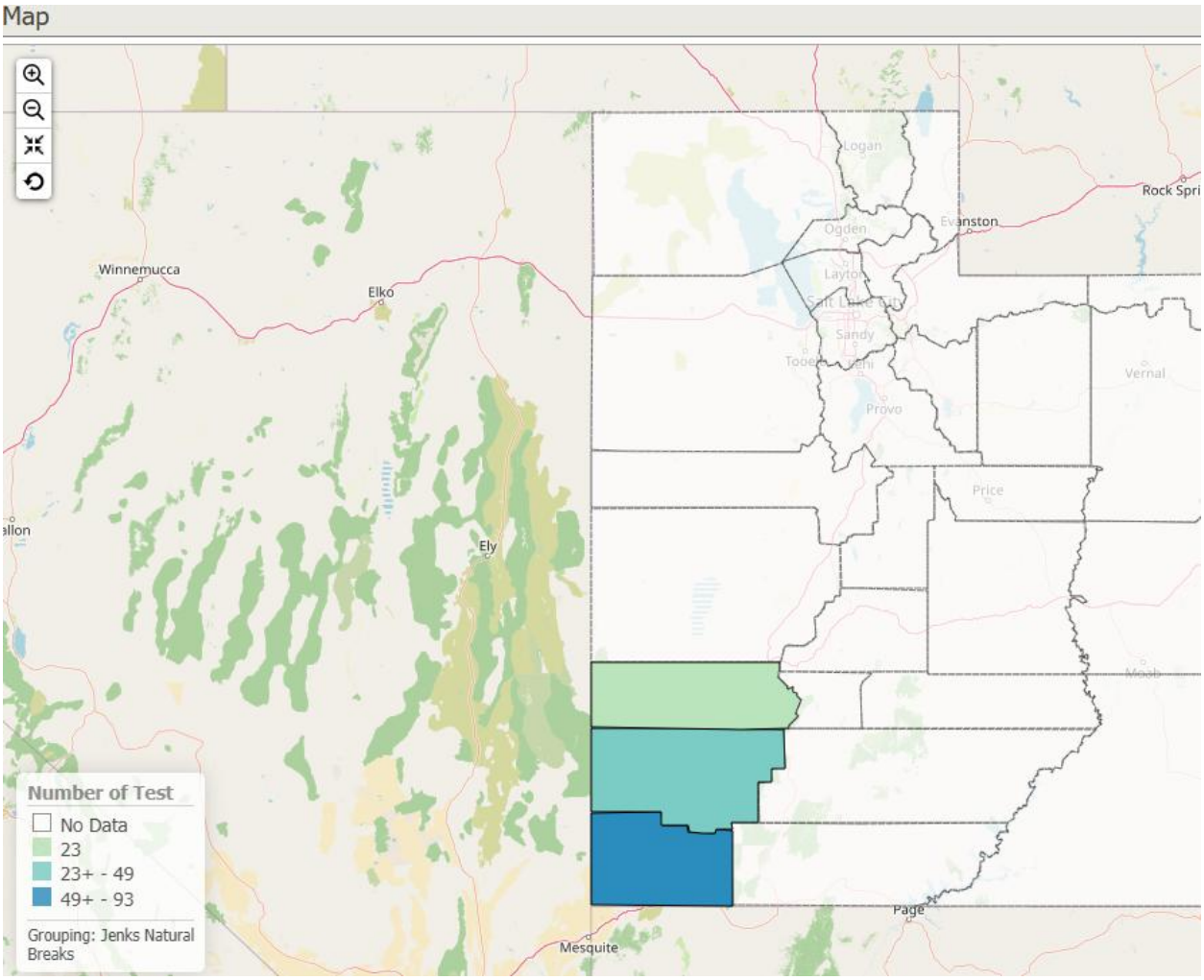


Figure 40: 2022 Map of Number of Pre-Mitigation Radon Tests on Buildings (Five County AOG Region)[91]

Radon risk in the area is generally localized rather than uniform, meaning that elevated indoor radon levels can occur in any county or community regardless of broader regional trends. As a result, radon presence is considered a location-based hazard affecting all five counties, with potential impacts wherever occupied structures exist. Because radon cannot be detected without testing, its geographic distribution is best understood at the site-specific level rather than through visual or environmental indicators.

Magnitude and Extent

The extent of radon is measured by the concentration of radon gas present in indoor air and is expressed in picocuries per liter (pCi/L). The U.S. EPA has established an action level of 4.0 pCi/L, at or above which mitigation is recommended to reduce long-term health risks. Radon concentrations between 2.0 and 3.9

[91] Utah.Gov, "Utah Environmental Public Health Tracking Portal: Map of Pre-Mitigation Radon Testing of Buildings in Five County Region," 2022, https://ibis.utah.gov/epht-view/query/result/radon/RadonNumberTest/Count.html.

pCi/L are considered moderate, and mitigation should be considered at these levels.[92] As a result, the extent of radon in the five-county region is best defined by indoor testing results rather than by geographic boundaries, with severity increasing as measured concentrations exceed EPA guidance levels.

While radon does not have an intensity scale like earthquakes or hurricanes, the EPA uses concentration ranges to describe the extent and severity of radon exposure risk, as displayed in Table 33.

Table 33: Radon Severity Scale[93]

Extent and Severity Interpretation	Radon Level (pCi/L)
Average outdoor background level	~0.4 pCi/L
U.S. average indoor level	~1.3 pCi/L
Moderate extent – EPA recommends considering mitigation	2.0–3.9 pCi/L
High extent – EPA action level; mitigation recommended	≥ 4.0 pCi/L

Radon concentration can range from approximately 0.4 pCi/L in outdoor air to substantially higher indoor levels. EPA estimates the national average indoor level at about 1.3 pCi/L, recommends considering corrective action between 2 and 4 pCi/L, and recommends fixing homes at or above 4 pCi/L. Health risk increases with concentration and duration of exposure; the action level is not a boundary between safe and unsafe conditions.

Previous Occurrences

Radon is a naturally occurring hazard that does not manifest as a discrete or sudden event and therefore does not meet the criteria for a disaster declaration under the Stafford Act. Because radon is a persistent indoor environmental condition rather than a discrete incident, the plan evaluates occurrence through indoor testing and exposure information rather than an event chronology. State agencies recognize radon as a leading cause of lung cancer and the deadliest geologic hazard in the state, with impacts occurring gradually over extended periods of exposure rather than through immediate or observable incidents.[94]

FEDERAL DECLARATIONS

FEMA disaster declarations are not an appropriate measure of radon occurrence because radon is a chronic indoor hazard rather than a discrete disaster incident. Accordingly, this profile does not use declaration records to estimate radon frequency, location, or exposure.

[92] U.S. Environmental Protection Agency, "What Is EPA's Action Level for Radon and What Does It Mean?" 2026, https://www.epa.gov/radon/what-epas-action-level-radon-and-what-does-it-mean.
[93] U.S. Environmental Protection Agency, "What Is EPA's Action Level."
[94] Utah Geological Survey, "Radon Gas Hazards," https://geology.utah.gov/hazards/problem-soils/radon/.

STATE DECLARATIONS

State declarations are likewise not used to characterize radon occurrence or exposure. Indoor testing data and building-specific follow-up provide the relevant evidence for this hazard.

Probability of Future Occurrences

Radon exposure is expected to continue across all five counties due to the area's geological conditions. Statewide information confirms that elevated indoor radon occurs in Utah, but the available information in this section does not establish a representative prevalence rate for each county or participating jurisdiction.[95] Because radon is continuously generated and building concentrations vary over time, the plan's discrete-event recurrence categories are not applicable. The likelihood that an individual building has an elevated concentration can be determined only through testing.

Future radon risk is expected to persist and potentially increase as residential and commercial development continues across the region. Growth in Washington and Iron Counties, as well as ongoing infill and rural development in Beaver, Kane, and Garfield Counties, will increase the number of occupied structures potentially exposed to radon. New construction occurring in previously undeveloped areas may lack site-specific radon testing data, and unless radon-resistant construction practices and post-construction testing are routinely implemented, future buildings may unknowingly expose occupants to elevated radon levels. Existing homes and public buildings that have not been tested or mitigated will also remain vulnerable.

Future changes in radon risk are expected to be driven primarily by the number and type of occupied ground-contact buildings, testing rates, radon-resistant construction, mitigation, and occupancy patterns. This profile does not assign a climate-driven trend because the available evidence does not support a region-specific projection of indoor radon concentrations.[96] Differences in awareness, access to testing resources, and mitigation implementation across the five counties may further influence future risk. Without increased education, testing, and mitigation efforts, elevated radon levels may remain undetected for extended periods, prolonging exposure.

Radon remains a continuing planning concern because of the following factors:

- Region-wide geological conditions that continuously generate radon gas
- The presence of residential, public, and critical facilities with direct ground contact
- Ongoing population growth and development that increase the number of exposed structures

Radon exposure will remain a continuing planning concern. New development can increase the number of potentially exposed occupants and buildings, while testing, radon-resistant construction, and mitigation

[95] Utah Geological Survey, "Radon Gas Hazards."
[96] F. K. T. Stanley et al., "Radon Exposure Is Rising Steadily within the Modern North American Residential Environment, and Is Increasingly Uniform across Seasons," *Scientific Reports* 9 (2019): 18472, https://www.nature.com/articles/s41598-019-54891-8.

can reduce risk. The direction and magnitude of future risk depend on those offsetting factors and are not quantified in this profile.

Vulnerability Assessment

The five-county planning area is broadly vulnerable to radon because naturally occurring gas can migrate from soil and rock into any occupied ground-contact building and accumulate indoors. Vulnerability is governed by site-specific geology, soil permeability, foundation and ventilation conditions, occupancy, and whether a building has been tested and mitigated. EPA classifies Beaver, Garfield, Iron, Kane, and Washington Counties as Zone 2, indicating predicted average indoor screening levels between 2 and 4 pCi/L; however, this generalized classification does not predict conditions in an individual structure. Homes, rental housing, schools, childcare facilities, healthcare and assisted-living facilities, government buildings, workplaces, lodging, and other frequently occupied structures are therefore vulnerable throughout the region. Consequences are primarily chronic public-health, economic, and operational burdens rather than sudden structural damage, and representative countywide testing and mitigation data are not available to support a comparative county rating.

BEAVER COUNTY

Beaver County's exposed assets include homes and rental housing, schools and childcare facilities, healthcare and assisted-living facilities, government buildings, businesses, and other occupied ground-contact structures. EPA's Zone 2 classification indicates a predicted average indoor screening level of 2 to 4 pCi/L, but only building-specific testing can determine whether concentrations exceed EPA guidance.

Susceptibility is greater in buildings with basements, crawlspaces, slab-on-grade foundations, cracks, utility penetrations, or limited ventilation. The county's dispersed communities, older structures, and distance from testing or mitigation providers may delay detection and corrective action. Fewer people and buildings are exposed than in the region's larger counties, but prolonged undetected exposure can still create substantial individual health consequences.

The principal consequence is cumulative lung-cancer risk for occupants of untested or unmitigated buildings. Property owners and public agencies may also incur testing, follow-up, and mitigation costs. These expenses and provider travel may be especially burdensome for lower-income households, landlords, and owners of remote or older properties.

Cascading impacts: Delayed detection can extend exposure for years, increasing potential medical and household burdens. A high test result may lead to follow-up testing, contractor scheduling, temporary building-use disruptions, deferred maintenance, or complications during a property transaction. Elevated results in schools, healthcare facilities, or public buildings could also require risk communication, reprioritized capital funding, and operational adjustments while corrective work is completed.

Changes in development: Infill and rural development will add occupied ground-contact structures and may increase the number of people potentially exposed. New construction can reduce vulnerability when

radon-resistant features and post-construction testing are used; without them, development may create additional unrecognized exposure. Renovation, weatherization, or changes that tighten a building envelope may also alter indoor accumulation, supporting testing after major construction or occupancy changes.

GARFIELD COUNTY

Garfield County's exposed assets include homes and rental housing, schools and childcare facilities, healthcare and assisted-living facilities, government buildings, businesses, lodging, and other occupied ground-contact structures. EPA's Zone 2 classification indicates a predicted average indoor screening level of 2 to 4 pCi/L, but it is not a substitute for testing individual buildings.

Vulnerability is influenced by foundation type, soil contact, cracks and penetrations, and ventilation. Dispersed communities, older buildings, seasonal or visitor-serving properties, and long travel distances to qualified service providers may prolong the period between testing and mitigation. Although the county has relatively few permanent residents and structures, residents, workers, and visitors may all occupy buildings with unknown radon concentrations.

The primary impact is long-term lung-cancer risk from repeated exposure in untested or unmitigated spaces. Owners of homes, lodging, businesses, and public facilities may face testing and mitigation costs. Remote locations and a limited contractor base may add time or expense, while elevated results can affect occupancy decisions and property or lodging marketability.

Cascading impacts: Undetected radon can compound health and financial effects over time. When elevated levels are found, follow-up testing and corrective work may disrupt households, lodging operations, schools, or public services and may require additional outreach to residents and visitors. Limited local capacity can delay work, and households or small businesses unable to fund mitigation may defer action, extending exposure and increasing inequities.

Changes in development: New homes, visitor accommodations, and public-serving facilities will expand the inventory of potentially exposed buildings. Radon-resistant construction and verification testing can reduce that added vulnerability; absent those measures, growth in previously undeveloped areas may create structures with unknown conditions. Rehabilitation or energy-efficiency work that changes ventilation can also affect indoor concentrations, making testing appropriate after substantial building changes.

IRON COUNTY

Iron County's exposed assets include homes and multifamily housing, schools and childcare facilities, healthcare and assisted-living facilities, government buildings, commercial buildings, and other frequently occupied ground-contact structures. EPA's Zone 2 classification indicates a predicted average indoor screening level of 2 to 4 pCi/L, while individual buildings may be above or below that range and require testing to characterize exposure.

The concentration of population and development in and around Cedar City and other communities increases the number of residents, workers, and students potentially exposed. Buildings with basements, crawlspaces, slab-on-grade construction, foundation openings, or limited ventilation are susceptible, and older untested structures may retain long-standing vulnerability. Multifamily and rental occupants may have less control over testing and mitigation decisions.

The dominant impact is cumulative lung-cancer risk in residences and frequently occupied facilities. Testing, follow-up, and mitigation also impose costs on households, landlords, businesses, school districts, healthcare providers, and public agencies. Elevated results may delay property transactions or occupancy and require corrective work in facilities serving large populations.

Cascading impacts: Prolonged undetected exposure may increase future health and medical burdens across a growing population. Discovery of elevated radon in an apartment complex, school, healthcare facility, or government building can trigger additional testing, tenant or public notification, capital-funding decisions, and temporary operational disruption. Uneven access to testing and mitigation may disproportionately affect renters, lower-income households, and occupants of older facilities.

Changes in development: Continued residential, commercial, institutional, and multifamily construction will increase the number of occupied ground-contact spaces and the aggregate population potentially exposed. Consistent use of radon-resistant construction and post-construction testing can offset this increase; otherwise, rapid growth may add unrecognized exposure faster than testing and mitigation occur. Infill, renovation, and energy-efficiency upgrades also warrant attention because foundation or ventilation changes can affect indoor radon accumulation.

KANE COUNTY

Kane County's exposed assets include homes and rental housing, schools and childcare facilities, healthcare facilities, government buildings, businesses, lodging, seasonal housing, and other frequently occupied ground-contact structures. EPA's Zone 2 classification indicates a predicted average indoor screening level of 2 to 4 pCi/L, but generalized mapping cannot establish the concentration in any individual building.

Susceptibility is shaped by foundations and soil contact, cracks and penetrations, and ventilation. Dispersed communities, seasonal occupancy, visitor-serving properties, and long distances to testing and mitigation providers may delay detection or corrective action. The county's smaller permanent population limits aggregate exposure relative to larger counties, but residents, seasonal workers, and visitors can still experience prolonged exposure in untested buildings.

The principal consequence is cumulative lung-cancer risk, accompanied by testing and mitigation costs for households, lodging operators, businesses, and public agencies. Travel and contractor availability may increase costs or scheduling time, and elevated results may complicate property transfers, lodging operations, or continued occupancy.

Cascading impacts: Because radon produces no immediate warning, exposure may continue for years before testing identifies a problem. A high result can lead to repeat testing, public or guest communication, contractor scheduling, and temporary disruption of homes, lodging, schools, or government facilities. Limited service availability and mitigation affordability may extend exposure, while concern about elevated results can affect housing or lodging marketability.

Changes in development: Additional housing, seasonal residences, lodging, and public facilities will expand the number of structures requiring testing and potential mitigation. Radon-resistant construction and testing after occupancy can reduce vulnerability; without these practices, tourism-related and residential growth may increase both short- and long-term exposure. Renovations or weatherization that alter air exchange can also change indoor concentrations and should prompt testing.

WASHINGTON COUNTY

Washington County's exposed assets include homes and multifamily housing, schools and childcare facilities, healthcare and assisted-living facilities, government and commercial buildings, lodging, and other frequently occupied ground-contact structures. EPA's Zone 2 classification indicates a predicted average indoor screening level of 2 to 4 pCi/L; however, testing is needed because an individual building may have a substantially different concentration.

The county's large population, high housing concentration, and sustained development in and around St. George, Washington, Hurricane, Santa Clara, and other communities create the region's largest aggregate inventory of potentially exposed occupants and buildings. Susceptible structures include those with slabs, crawlspaces, basements, foundation openings, or limited ventilation. Older untested buildings remain vulnerable, while renters and multifamily occupants may depend on owners or managers to authorize corrective action.

The primary impact is cumulative lung-cancer risk across residences, schools, healthcare settings, lodging, workplaces, and public facilities. Testing and mitigation costs may affect households, landlords, lodging operators, businesses, school districts, healthcare providers, and local governments. The county's larger building inventory means that even a limited share of elevated structures could create substantial aggregate testing, communication, and capital needs.

Cascading impacts: Delayed detection can extend exposure across large households, apartment populations, student bodies, patients, employees, and guests. Elevated results in multifamily housing or major public-serving facilities may trigger broad follow-up testing, tenant or public notification, funding decisions, and temporary disruptions during mitigation. Property transfers or leasing may be delayed, and inability to afford corrective work can create disproportionate burdens for lower-income households and renters.

Changes in development: Continued residential, commercial, educational, healthcare, and lodging development will add occupied ground-contact buildings and increase potential aggregate exposure. Routine use of radon-resistant construction and post-construction testing can materially reduce this added risk; without those measures, rapid growth may expand the stock of untested buildings. Infill,

renovation, and energy-efficiency improvements that change foundations or ventilation also support retesting so that development does not unintentionally increase indoor accumulation.

Thunderstorm and Lightning

Thunderstorms

A thunderstorm is a local storm produced by a cumulonimbus cloud and accompanied by lightning and thunder. Thunderstorms may occur as individual cells, clusters, or lines and can produce lightning, strong outflow winds, hail, tornadoes, and brief heavy rainfall. Duration, organization, and impacts vary by storm type and atmospheric conditions.

Associated hazards include damaging winds, hail, tornadoes, flash flooding, and wildfire ignition. Dry thunderstorms occur when precipitation evaporates before reaching the ground while cloud-to-ground lightning remains possible. These storms are an important wildfire-ignition concern in the western United States. Flash-flood consequences associated with thunderstorm rainfall are addressed in the flooding profile and are not quantified here without a defined, current source period.

TYPES OF THUNDERSTORMS[97]

- **Single-Cell Thunderstorms:** Also called "popcorn" convection, these are small, brief, weak storms that grow and die within an hour or so. They are typically driven by heating on a summer afternoon. Single-cell storms may produce brief heavy rain and lightning.
- **Multicell Thunderstorms:** This is the most common type of thunderstorm, in which new updrafts form along the leading edge of rain-cooled air (the gust front). Individual cells usually last 30 to 60 minutes, while the system as a whole may last for many hours. Multicell storms may produce hail, strong winds, brief tornadoes, and/or flooding.
- **Squall Line:** A small group of storms arranged in a line, often accompanied by "squalls" of high wind and heavy rain, a squall line tends to pass quickly and is less prone to producing tornadoes than are supercells. Squall lines can be hundreds of miles long but are typically only 10 or 20 miles wide.
- **Supercell:** A supercell is a long-lived (greater than 1 hour) and highly organized storm feeding off an updraft (a rising current of air) that is tilted and rotating. This rotating updraft—as large as 10 miles in diameter and up to 50,000 feet tall—can be present as much as 20 to 60 minutes before a tornado forms. This rotation is called a mesocyclone when it is detected by Doppler radar. The tornado is a very small extension of this larger rotation. Most large and violent tornadoes come from supercells.

[97] National Oceanic and Atmospheric Administration, National Severe Storms Laboratory, "Severe Weather 101: Thunderstorms, Thunderstorm Types," 2026, https://www.nssl.noaa.gov/education/svrwx101/thunderstorms/types/.

Lightning

Lightning is a giant spark of electricity in the atmosphere between clouds, the air, or the ground. In the early stages of development, air acts as an insulator between the positive and negative charges in the cloud and between the cloud and the ground. When the opposite charges build up enough, this insulating capacity of the air breaks down and there is a rapid discharge of electricity that we know as lightning. The flash of lightning temporarily equalizes the charged regions in the atmosphere until the opposite charges build up again. Lightning can occur between opposite charges within the thunderstorm cloud (intra-cloud lightning) or between opposite charges in the cloud and on the ground (cloud-to-ground lightning).[98]

Every thunderstorm produces lightning. Lightning can cause death, injury, fire, and damage to electrical and communications systems. This profile relies on documented Five County AOG events rather than generalized national annual averages.

COMMON LIGHTNING TYPES[99]

- **Cloud-to-Ground Flashes:** The most common type of cloud-to-ground lightning, a channel of negative charge, called a stepped leader, will zigzag downward in roughly 50-yard segments in a forked pattern. Channels of positive charge reach upward, normally from taller objects in the area, such as a tree, house, or telephone pole, and, when the leader and upward streamer connect, a powerful electrical current begins flowing. The luminous return stroke travels about 60,000 miles per second back toward the cloud.
- **Cloud Flashes:** There are many flashes that do not reach ground. Most of these remain within the cloud and are called intra-cloud lightning flashes. Cloud flashes sometimes have visible channels that extend out into the air around the storm (cloud-to-air) but do not strike the ground.

Location

Thunderstorm and lightning hazards affect all jurisdictions within the five-county region, with spatial variability tied to elevation, land use, and exposure patterns.

- In Beaver County, thunderstorms and cloud-to-ground lightning most frequently impact rural communities, agricultural areas, exposed highways, and utility corridors, where open terrain increases lightning strike potential and gusty outflow winds can disrupt power infrastructure and farming operations.
- In Garfield County, thunderstorm and lightning events are concentrated in canyonlands, high-elevation terrain, backcountry, and recreation areas, including national parks and remote public lands,

[98] National Oceanic and Atmospheric Administration, "Severe Weather 101, Lightning Basics, What Is Lightning?" 2026, https://www.nssl.noaa.gov/education/svrwx101/lightning/.
[99] National Oceanic and Atmospheric Administration, "Severe Weather 101, Lightning Types," 2026, https://www.nssl.noaa.gov/education/svrwx101/lightning/types/.

where storms often produce frequent lightning, strong downdraft winds, and dry lightning capable of igniting wildfires.

- Iron County experiences thunderstorms and lightning across both developed areas and rural landscapes, with elevated risk to power infrastructure, wildland-urban interface zones, and population centers, making this county particularly vulnerable to lightning-related outages and wind damage.
- In Kane County, the highest thunderstorm and lightning exposure occurs in slot canyons, high-elevation terrain, parks, and outdoor recreation corridors, where localized storms can create life-safety hazards for residents and visitors due to lightning strikes, sudden wind shifts, and rapidly changing weather conditions.
- Washington County faces the most widespread thunderstorm and lightning impacts, with events affecting urbanized areas, expanding residential developments, transportation corridors, and adjacent desert and recreational landscapes, resulting in a higher concentration of structural exposure, population risk, and documented lightning-related damages. Together, these county-specific patterns demonstrate that thunderstorms and lightning are regionwide hazards with distinct geographic concentrations of risk within each jurisdiction.

Magnitude and Extent

THUNDERSTORMS

NWS classifies a thunderstorm as severe when it produces a tornado, hail at least 1 inch in diameter, or wind gusts of at least 58 mph. Lightning and heavy rainfall can be dangerous but are not severe thunderstorm criteria. Observed magnitude is described using documented wind gusts, hail diameter, lightning activity, rainfall, and associated impacts when those measures are available.

Table 34: Severe Thunderstorm Risk Categories

Severe Thunderstorm Risk Categories	Description
Thunderstorms (no label)	• No severe thunderstorms expected • Lightning and flooding threats exist with all thunderstorms • Winds to 40 mph • Small hail
1-Marginal (MRGL)	• Isolated severe thunderstorms possible • Limited in duration and/or coverage and/or intensity • Winds 40–60 mph • Hail up to 1 inch • Low tornado risk
2-Slight (SLGT)	• Scattered severe storms possible

Severe Thunderstorm Risk Categories	Description
	• Short-lived and/or not widespread, isolated intense storms possible • One or two tornadoes • Reports of strong winds/wind damage • Hail approximately 1 inch, isolated 2 inches
3-Enhanced (ENH)	• Numerous severe storms possible • More persistent and/or widespread, a few intense • A few tornadoes • Several reports of wind damage • Damaging hail, 1–2 inches
4-Moderate (MDT)	• Widespread severe storms likely • Long-lived, widespread and intense • Strong tornadoes • Widespread wind damage • Destructive hail, 2+ inches
5-High (High)	• Widespread severe storms expected • Long-lived, very widespread and particularly intense • Tornado outbreak • Derecho

The Storm Prediction Center categorical outlooks describe the forecast probability and expected organization of severe weather within a specified area and period. They are not an observed-event magnitude scale. The NWS severe-thunderstorm criteria are a tornado, hail at least 1 inch in diameter, or wind gusts of at least 58 mph. Table 34 is retained as forecast context only and is not used to rate the magnitude of historical Five County AOG events.

LIGHTNING

Lightning is responsible for many wildfires and can cause fatalities. The Lightning Activity Level (LAL) is a tool that was originally developed to characterize lightning risk for use as an input into the National Fire Danger Rating System (NFDRS). The LAL has a range of values from 1 through 6: a value of 1 represents no lightning, values from 2 through 5 represent an increasing coverage of wet thunderstorms and corresponding increases in the frequency of lightning strikes, while 6 represents rare dry lightning events with a lightning frequency similar to a LAL of 3.

Table 35: Lightning Activity Levels[100]

Lightning Activity Level (LAL 1–6)	Description
LAL 1	No thunderstorms
LAL 2	Isolated thunderstorms. Light rain will occasionally reach the ground. Lightning is very infrequent, 1 to 5 cloud-to-ground strikes in a 5-minute period.
LAL 3	Widely scattered thunderstorms. Light to moderate rain will reach the ground. Lightning is infrequent, 6 to 10 cloud-to-ground strikes in a 5-minute period.
LAL 4	Scattered thunderstorms. Moderate rain is commonly produced. Lightning is frequent, 11 to 15 cloud-to-ground strikes in a 5-minute period.
LAL 5	Numerous thunderstorms. Rainfall is moderate to heavy. Lightning is frequent and intense, greater than 15 cloud-to-ground strikes in a 5-minute period.
LAL 6	Dry lightning (same as LAL 3 but without the rain). A dry lightning situation. Low lightning flash rate observed (less than one to three cloud-to-ground strikes per 5-minute period per storm cell passage). Scattered towering clouds with a few thunderstorms; bases of the clouds are high.

Previous Occurrences

Thunderstorms and lightning have caused injuries, fatalities, property damage, outages, and transportation and recreation disruptions in the five-county region. In canyon and slot-canyon settings, localized heavy rainfall can also generate dangerous flash flooding. Table 37 summarizes selected, verified NOAA NCEI thunderstorm wind and lightning records; it is not a complete NCEI event inventory.

In Five County AOG communities, severe weather can impact roads, infrastructure, and structures. Common damages reported include downed power lines, damaged roof structures from thunderstorm wind, and delays on roadways due to flooding. In the region, power outages are a noted vulnerability, especially for older adults throughout the region.

FEDERAL DECLARATIONS

Federal declarations for severe storms or flooding may include thunderstorm-related impacts, but declaration titles do not isolate lightning or thunderstorm wind as the cause of loss. The declaration table is therefore used as contextual evidence of broader severe-storm impacts and not as a complete occurrence record for this hazard.

[100] National Oceanic and Atmospheric Administration, National Weather Service, "Forecast Weather Glossary," 2024, https://www.weather.gov/media/rnk/fire/LAL.pdf.

STATE DECLARATIONS

Executive Order 2024-01 declared a statewide emergency due to flooding on August 23, 2024. Table 36 includes this state example alongside two federal severe-storm/flood declarations as broader hazard context; the order does not identify lightning as the cause of loss.

Table 36: Thunderstorm Previous Disaster Declarations[101]

Year	Declaration Number	Declaration Type	Title and Description
2005	DR-1576	Federal	Severe Storms and Flooding; incident period January 8–12, 2005; declared February 1, 2005.
2012	DR-4088	Federal	Severe Storm and Flooding; incident September 11, 2012; declared November 3, 2012.[102]
2024	Executive Order 2024-01	State	Statewide emergency due to flooding, issued August 23, 2024; not a lightning-specific declaration.

SELECTED PREVIOUS THUNDERSTORM AND LIGHTNING EVENTS

Table 37: Selected Verified NOAA NCEI Thunderstorm Wind and Lightning Records, 2000–May 2026

Date/ Period	County and Location	Hazard / Reported Impact	Source/Event ID
12/26/2005	Washington County: St. George Municipal Airport	Thunderstorm wind; ten phone poles down northwest of St. George; $20,000 reported property damage.	NOAA NCEI Event 5483711
7/30/2010	Washington County: Santa Clara	Thunderstorm wind; multiple power lines down; $30,000 reported property damage.	NOAA NCEI Event 252319
2/16/2011	Washington County: Washington	Thunderstorm wind; barn and power-line damage; $35,000 reported property damage.	NOAA NCEI Event 287606

[101] Federal Emergency Management Agency, DR-1576-UT and DR-4088-UT disaster records, https://www.fema.gov/disaster/1576 and https://www.fema.gov/disaster/4088; Utah Office of Administrative Rules, Executive Order 2024-01, https://rules.utah.gov/wp-content/uploads/Utah-Executive-Order-No.-2024-01.pdf. Reviewed October 9, 2026.

[102] Federal Emergency Management Agency, "Disasters and Other Declarations: DR-4088-UT, Utah Severe Storms and Flooding," 2022, https://www.fema.gov/disaster/4088.

Date/ Period	County and Location	Hazard / Reported Impact	Source/Event ID
8/18/2011	Garfield County: Bryce Canyon	Lightning; one fatality.	NOAA NCEI Event 345039
7/21/2012	Garfield County: Boulder	Lightning; one fatality.	NOAA NCEI Event 403653
7/25/2016	Beaver County: Milford	Thunderstorm wind / microburst; 16 power poles down and widespread outage; $20,000 reported property damage.	NOAA NCEI Event 653341
9/14/2017	Kane County: Glen Canyon	Thunderstorm wind; three injuries and overturned boats; $500,000 reported property damage.	NOAA NCEI Event 718349
4/7/2018	Washington County: Santa Clara record; narrative locates the home in St. George	Lightning-caused residential fire in St. George; $400,000 reported property damage.	NOAA NCEI Event 748262
7/24/2021	Washington County: Rockville record; narrative reports impacts in Hildale	Thunderstorm wind; downed power poles and trees reported in Hildale; $80,000 reported property damage.	NOAA NCEI Event 974340
8/21/2022	Garfield County: Cannonville	Thunderstorm wind; roof damage; $20,000 reported property damage.	NOAA NCEI Event 1054501
10/18/2024	Washington County: Toquerville	Thunderstorm wind; property and solar-panel damage; $50,000 reported property damage.	NOAA NCEI Event 1217203

Probability of Future Occurrences

Thunderstorms and lightning will remain recurring hazards across Beaver, Garfield, Iron, Kane, and Washington Counties. Consistent with the plan-wide scale, a county rating should be based on a reproducible analysis of historical event frequency over a stated period. Because that county-level calculation is not available in this profile, comparative probability labels are not assigned. Potential consequences are summarized below and evaluated further through the vulnerability and impact discussion.

- In Beaver County, future thunderstorms may produce cloud-to-ground lightning and gusty winds that disrupt utilities and agricultural operations.

- In Garfield and Kane Counties, storms in canyonlands, high-elevation terrain, and recreation areas may produce lightning, gusty outflow winds, and hazardous conditions for residents and visitors, including wildfire ignition during dry thunderstorms.
- In Iron County, thunderstorms may damage power infrastructure and buildings and expose rural areas to lightning and dry-lightning wildfire ignition.
- In Washington County, concentrated population and development can increase consequences when thunderstorms produce lightning, damaging winds, or localized flash flooding.

Future thunderstorms will continue to range from nonsevere to severe. The Fifth National Climate Assessment provides context for considering heavier precipitation and associated flash-flood consequences in the Southwest, but it does not establish a county-level increase in lightning frequency or severe thunderstorm occurrence for the five-county region. Accordingly, this profile does not assign an increasing local trend.[103]

Table 38: Future Thunderstorm and Lightning Risk by County

County	Future Probability	Primary Thunderstorm and Lightning Hazards	Locations of Greatest Risk	Anticipated Intensity
Beaver County	Not assigned; a comparative county probability requires a documented event-frequency method.	Cloud-to-ground lightning; gusty thunderstorm winds; brief heavy rainfall	Rural communities, agricultural areas, exposed highways, utility corridors	Nonsevere to occasionally severe thunderstorms capable of utility disruptions and localized damage
Garfield County	Not assigned; a comparative county probability requires a documented event-frequency method.	Frequent lightning; gusty outflow winds; dry lightning with wildfire ignition potential	Canyonlands, high-elevation terrain, backcountry and recreation areas	Nonsevere to severe storms; lightning-driven life safety risk and localized wind damage
Iron County	Not assigned; a comparative county probability requires a	Cloud-to-ground lightning; damaging thunderstorm winds;	Developed areas, power infrastructure, rural and	Severe thunderstorms producing strong winds with recurring

[103] U.S. Global Change Research Program, Fifth National Climate Assessment, 2023, Overview and Chapter 28, Southwest; U.S. Global Change Research Program, Fifth National Climate Assessment (2023), Chapter 28, Southwest. https://nca2023.globalchange.gov/chapter/28/. This source provides regional climate context, not a county-level lightning-frequency projection.

County	Future Probability	Primary Thunderstorm and Lightning Hazards	Locations of Greatest Risk	Anticipated Intensity
	documented event-frequency method.	localized flash flooding	wildland-urban interface	infrastructure impacts
Kane County	Not assigned; a comparative county probability requires a documented event-frequency method.	Lightning strikes; gusty downdraft winds; hazardous conditions for outdoor recreation	Slot canyons, high-elevation terrain, parks and recreation corridors	Nonsevere to severe storms; localized high-impact lightning and wind events
Washington County	Not assigned; a comparative county probability requires a documented event-frequency method.	Cloud-to-ground lightning; damaging outflow winds; brief heavy rainfall; localized flash flooding	Developed communities, transportation and utility corridors, wildland-urban interface, and recreation areas	Nonsevere to severe thunderstorms; observed magnitude should be described using documented gusts, hail size, lightning activity, rainfall, and impacts

Vulnerability Assessment

Thunderstorms and lightning affect all five counties through cloud-to-ground lightning, damaging outflow winds, brief heavy rainfall, localized flash flooding, and, during dry storms, wildfire ignition. Vulnerability varies with population and asset concentration, terrain, utility and transportation exposure, outdoor recreation use, and the distance to shelter and emergency services. The county assessments below use documented events and reported losses already presented in this profile; the figures are examples rather than complete loss totals, and no comparative quantitative vulnerability rating is assigned without a consistent exposure-and-loss methodology.

BEAVER COUNTY

Beaver County's dispersed communities, agricultural lands, open terrain, exposed highways, and long above-ground utility corridors are vulnerable to lightning, microburst and outflow winds, hail, and brief heavy rainfall. Residents, travelers, recreationists, farms, outbuildings, irrigation equipment, and critical facilities may be affected, and limited system redundancy can allow localized damage to interrupt services over a broad rural area.

Documented impacts illustrate the county's sensitivity to concentrated storm damage. On July 25, 2016, a microburst near Milford downed 16 power poles, caused a widespread outage affecting most customers,

and resulted in approximately $20,000 in reported property damage. Similar events could damage roofs and agricultural facilities, create hazardous travel conditions, interrupt communications and public services, or ignite rangeland wildfire through dry lightning.

Cascading impacts: Damage to electric distribution systems can affect homes, public facilities, communications, water and wastewater operations, fuel access, refrigeration, and agricultural pumps or pivots. Debris, reduced visibility, or damaged roadside infrastructure can delay emergency response and utility restoration. A lightning-caused wildfire could simultaneously threaten rangeland, utility corridors, transportation routes, and scattered development while drawing limited local response resources away from other storm incidents.

Changes in development: New housing, commercial activity, agricultural improvements, energy or utility facilities, and supporting roads can increase the number and value of assets exposed to thunderstorms, particularly where growth extends along rural utility lines or into open and wildland-adjacent areas. Current building and electrical standards can reduce wind and lightning losses, but continued development may also increase service demands and the consequences of a single corridor outage. Future land-use and capital planning should therefore account for backup power, utility hardening, defensible space, drainage, and reliable emergency access.

GARFIELD COUNTY

Garfield County's vulnerability is concentrated in remote communities, canyon and high-elevation terrain, transportation routes, public lands, and heavily used recreation areas such as Bryce Canyon and Boulder Mountain. Rapid storm development, limited shelter, long travel distances, and constrained communications can expose residents and visitors to lightning, strong outflow winds, brief heavy rainfall, and dry-lightning wildfire ignition while complicating warning and response.

The county's documented record includes lightning fatalities near Bryce Canyon in 2011 and on Boulder Mountain in 2012. A 2022 thunderstorm in Cannonville caused roof damage and approximately $20,000 in reported property damage. These events show that a limited number of storms can produce severe life-safety consequences and localized structural losses where people are outdoors or access to shelter and emergency assistance is limited.

Cascading impacts: Lightning or wind damage to utilities can interrupt communications, water systems, park operations, public facilities, and visitor services. Road debris, localized flooding, or closures along canyon and recreation access routes can delay medical response, restrict evacuation, and isolate travelers. Dry-lightning wildfire starts may threaten campgrounds, trails, utilities, and remote development while diverting emergency resources, disrupting tourism, and extending recovery beyond the original storm area.

Changes in development: Additional housing, visitor facilities, utility extensions, and transportation improvements can increase exposure in communities and recreation corridors, even where overall population density remains low. Growth near canyon terrain, forest or rangeland, and remote access routes may place more people and assets in locations with limited shelter and response capacity. Updated

construction practices, lightning protection, resilient communications, drainage, wildfire-resistant siting, and evacuation planning can moderate risk as development and visitation increase.

IRON COUNTY

Iron County combines concentrated development around Cedar City with extensive rural, agricultural, recreation, and wildland areas. Population centers, Interstate 15 and other transportation routes, above-ground utilities, public facilities, businesses, and wildland-urban interface neighborhoods are exposed to lightning, damaging wind, hail, brief heavy rainfall, and localized flash flooding. Dry lightning also creates a pathway from a thunderstorm to wildfire in surrounding rangeland and forested areas.

The concentration of residents, structures, critical facilities, transportation infrastructure, and utility networks means that one severe storm could affect many people and services at once. Expected direct impacts include outages, roof and outbuilding damage, hazardous travel, localized flooding, outdoor lightning exposure, and storm-related wildfire ignition.

Cascading impacts: Damage to power lines, substations, or distribution equipment can interrupt service to homes, businesses, schools, medical facilities, water and wastewater systems, traffic controls, and communications networks. Incidents on Interstate 15 or local roads can delay emergency response and disrupt commuting and freight movement. If dry lightning ignites a wildfire, the event may threaten development and utility corridors, cause evacuations or closures, and divert firefighting and law-enforcement resources from concurrent storm impacts.

Changes in development: Continued residential, commercial, institutional, and infrastructure growth—particularly around Cedar City, transportation corridors, and wildland-urban interface areas—will increase the number and value of exposed assets. New development can improve resilience when it incorporates current wind-resistant construction, lightning protection, drainage, backup power, redundant communications, and emergency access. Conversely, expansion into areas served by long utility feeders or near wildfire-prone vegetation can increase outage, evacuation, and response demands during severe thunderstorms.

KANE COUNTY

Kane County's remote communities, Lake Powell and Glen Canyon facilities, slot canyons, campgrounds, highways, and extensive public lands create substantial outdoor and visitor exposure. Lightning, microburst and outflow winds, brief heavy rainfall, and rapidly changing conditions can threaten boaters, hikers, campers, motorists, marina operations, utilities, and scattered development. Limited shelter, constrained communications, and long response distances can amplify consequences.

On September 14, 2017, severe thunderstorm winds in Glen Canyon injured three people, overturned multiple boats on Lake Powell, and caused approximately $500,000 in reported property damage. The event demonstrates how a short-duration storm can create concentrated life-safety and economic consequences among exposed visitors and high-value recreational assets. Other credible impacts include

lightning injury, marina or campground damage, hazardous canyon conditions, road disruption, and dry-lightning wildfire ignition.

Cascading impacts: Damage to power, communications, marina utilities, or access routes can interrupt visitor safety operations and access to fuel, water, medical assistance, and other essential services. Wind on open water, road closures, debris, or flooding in confined drainages can delay rescues and isolate residents or visitors. Dry-lightning wildfire starts may threaten campgrounds, utilities, and scattered development, divert response resources, close recreation areas, and disrupt tourism-dependent businesses well beyond the storm period.

Changes in development: Growth in communities and recreation-supporting development can place more residents, visitors, buildings, marina assets, and utility demands in exposed settings. Improvements to roads and facilities may enhance access and response, but they can also increase occupancy in areas subject to sudden wind, lightning, flooding, and wildfire. Future development can reduce vulnerability through weather-warning coverage, resilient communications and utilities, safe shelter, wind-resistant construction, drainage, evacuation planning, and careful siting near slot canyons, shorelines, and wildland vegetation.

WASHINGTON COUNTY

Washington County contains the planning area's largest concentration of population, housing, businesses, critical facilities, transportation corridors, utilities, and recreation assets. St. George, Washington, Santa Clara, Rockville, Toquerville, and other growing communities are exposed to lightning, damaging outflow winds, brief heavy rainfall, localized flash flooding, and fire ignition. High asset concentration means a localized storm can affect many people and community functions simultaneously.

Selected NCEI records document at least five thunderstorm-wind events in St. George, Santa Clara, Washington, Rockville, and Toquerville with approximately $215,000 in reported property damage, plus a 2018 lightning-caused residential fire in St. George with approximately $400,000 in reported damage. Together, these selected records total about $615,000, excluding unreported outages, emergency costs, business interruption, and other indirect losses. They demonstrate substantial exposure but are not a complete county loss inventory.

Cascading impacts: Power or communications failures can affect homes, schools, healthcare facilities, water and wastewater systems, traffic controls, businesses, and emergency coordination. Signal outages, debris, localized flooding, or damaged roads can disrupt commuting, freight movement, and emergency access. Lightning-caused structure or wildland fire can threaten neighborhoods and utilities while drawing resources from concurrent incidents, and resulting closures, service interruptions, and cleanup needs can extend community and economic impacts beyond the storm itself.

Changes in development: Continued residential and commercial growth will increase the number and value of people, structures, vehicles, and lifeline systems exposed to thunderstorms, particularly along expanding transportation and utility networks and at the wildland-urban interface. Modern codes, buried or hardened utilities, drainage improvements, backup power, redundant communications, and well-

designed emergency access can reduce vulnerability. Without these measures, expanding development may increase outage consequences, stormwater demands, traffic disruption, fire exposure, and the complexity of response and recovery.

Tornadoes

A tornado is a narrow, violently rotating column of air that extends from a thunderstorm to the ground. A tornado may be visible as a condensation funnel or through rotating dust and debris. Tornadoes can occur at any time of year and at any time of day. Tornadoes may form from supercell or non-supercell thunderstorms. Supercells contain persistent rotating updrafts and can also produce large hail, damaging straight-line winds, lightning, and heavy rainfall. Not every supercell produces a tornado, and some tornadoes form through non-supercell processes. This profile relies on the documented five-county event record rather than a generalized national annual count.

Types of Tornadoes

Tornadoes are commonly described as supercell or non-supercell tornadoes. Supercell tornadoes develop from thunderstorms with rotating updrafts; vertical wind shear contributes to storm-scale rotation. Only a subset of supercells produces tornadoes. Tornadogenesis depends on multiple interacting atmospheric conditions; warm, moist surface air alone is not sufficient.

Non-supercell tornadoes include landspouts and some waterspouts. A landspout develops from near-surface vertical vorticity beneath a growing convective cloud and does not require a preexisting rotating mesocyclone. Waterspouts occur over water and may be tornadic or fair-weather. These phenomena are not assigned a specific Enhanced Fujita Scale (EF) rating unless supported by an official damage survey.

Location

Tornadoes can occur in any location within the five-county region, as these hazards are associated with severe thunderstorms that may develop over both urbanized and rural areas. Historical records indicate that tornado occurrences in Beaver County have been scattered across the county, affecting open landscapes and areas near developed communities. In Garfield County, tornadoes have been documented near populated areas such as Panguitch as well as in surrounding rural portions of the county, demonstrating broad geographic exposure. The 2000–2025 NCEI query returned one Iron County tornado record, a landspout near Cedar City and Enoch on April 18, 2025. Kane County has no tornado event identified in the cited historical summary; however, consistent with statewide patterns identified in the 2024 Utah Enhanced State Hazard Mitigation Plan (SHMP), isolated weak tornadoes or landspout-type events remain possible anywhere within the county under favorable atmospheric conditions. Washington County has two documented tornado events during 2000–2025—one rated EF0 and one rated EFU—both recorded near Hurricane Airport. Consistent with Utah SHMP guidance, because tornadoes are short-lived and highly localized, their exact touchdown points cannot be predetermined; therefore, all areas within each county are considered potentially exposed to tornado hazards.

Magnitude and Extent

The Enhanced Fujita Scale became operational in the United States on February 1, 2007. The National Weather Service assigns an official EF0 through EF5 rating by evaluating damage indicators and degrees of damage and estimating the three-second gust associated with observed damage. EF Scale wind speeds are estimates, not direct measurements. Historical events before 2007 may be reported using the original Fujita Scale and should not be relabeled as EF ratings unless an authoritative source does so.

The EF Scale uses 28 damage indicators and eight degrees of damage to estimate three-second gusts at points of damage. The rating reflects the highest supported damage-based wind estimate along the surveyed path. Table 39 summarizes the EF Scale wind ranges; local extent should also report available path length, maximum path width, duration, rating, and affected locations.

Table 39: Enhanced Fujita Scale Ratings[104]

EF Scale Number	Intensity Phrase	Wind Speed (mph)	Type of Damage Done
EF0	Light tornado	65–85	Light damage. Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over.
EF1	Moderate tornado	86–110	Moderate damage. Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
EF2	Significant tornado	111–135	Considerable damage. Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
EF3	Severe tornado	136–165	Severe damage. Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.
EF4	Devastating tornado	166–200	Devastating damage. Well-constructed houses and whole frame houses completely leveled; cars thrown and small missiles generated.
EF5	Incredible tornado	>200	Incredible damage. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 meters

[104] National Oceanic and Atmospheric Administration, National Weather Service, "Enhanced Fujita Scale," https://www.weather.gov/tae/ef_scale.

EF Scale Number	Intensity Phrase	Wind Speed (mph)	Type of Damage Done
			(109 yards); high-rise buildings have significant structural deformation; incredible phenomena occur.

Previous Occurrences

Tornadoes can cause deaths, injuries, property damage, utility outages, and transportation disruption, but impacts vary substantially with path, intensity, exposure, and warning or shelter conditions. In communities, tornadoes can impact road access, infrastructure, and structures. Common damages reported include downed power lines, damaged roof structures from tornadoes, and delays on roadways due to debris blockage. In the region, power outages are a noted vulnerability, especially for older adults throughout the region.

FEDERAL DISASTER DECLARATIONS

Federal disaster declarations are not used as a complete tornado-occurrence record because tornado damage may be included within broader severe-storm declarations. No declaration specifically titled for tornadoes is used in this profile to establish event frequency.

STATE DISASTER PROCLAMATIONS

State emergency proclamations are likewise not used as a complete tornado-occurrence record because tornado impacts may occur within broader severe-weather emergencies.

PREVIOUS HAZARD EVENTS IN FIVE COUNTY REGION FROM NCEI DATABASE

Table 40 lists the 10 NCEI Tornado records returned for county-coded observations in Beaver, Garfield, Iron, Kane, and Washington Counties from January 1, 2000, through December 31, 2025. The records occurred on 10 distinct calendar dates and report $300,000 in property damage, no crop damage, and no injuries or deaths. They comprise three Beaver, four Garfield, one Iron, and two Washington County records; none was returned for Kane County. Absence of a reported record does not establish that tornado occurrence is impossible. F ratings precede use of the EF Scale; EFU denotes an unknown EF rating.

Table 40: NCEI Storm Events Database Tornado Records, 2000–2025[105]

Date	Event Type	Location	Magnitude	Fatalities	Injuries	Property Damage	Crop Damage
9/8/2000	Tornado	Panguitch, Garfield County	F0	0	0	$0	$0
9/4/2001	Tornado	Milford, Beaver County	F0	0	0	$0	$0
5/24/2009	Tornado	Milford, Beaver County	EF0	0	0	$0	$0
8/24/2011	Tornado	Hurricane Arpt, Washington County	EF0	0	0	$0	$0
8/21/2012	Tornado	Newhouse, Beaver County	EF0	0	0	$0	$0
8/26/2016	Tornado	Panguitch, Garfield County	EF0	0	0	$0	$0
9/22/2016	Tornado	Panguitch, Garfield County	EF1	0	0	$300,000	$0
7/8/2017	Tornado	Hurricane Arpt, Washington County	EFU	0	0	$0	$0
7/10/2017	Tornado	Hatch, Garfield County	EFU	0	0	$0	$0
4/18/2025	Tornado	(Cdc)Cedar City Arpt, Iron County	EF0	0	0	$0	$0

Figure 41 depicts mapped historical paths for 1950 through 2025.

[105] NOAA National Centers for Environmental Information, Storm Events Database, annual details CSV files retrieved October 10, 2026. https://www.ncei.noaa.gov/pub/data/swdi/stormevents/csvfiles/. Filters: Utah; county-coded Tornado; five planning-area counties; January 1, 2000–December 31, 2025. Event IDs: 5177903, 5275423, 170869, 346603, 409087, 658301, 660568, 715693, 715687, 1235810.

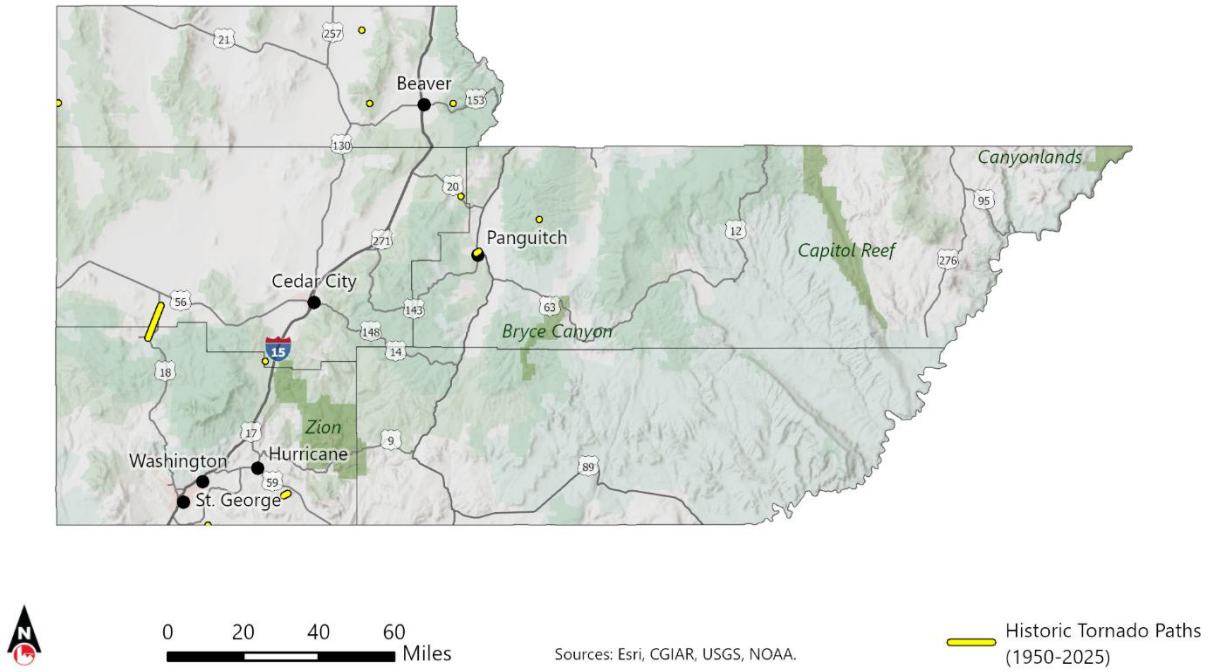


Figure 41: Historic Tornado Paths for Five County AOG Region (1950–2025)

Probability of Future Occurrences

While tornadoes are relatively infrequent in southwestern Utah compared to the central and southeastern United States, they remain a credible future hazard for Beaver County, Garfield County, Iron County, Kane County, and Washington County. The mapped record indicates tornado paths in Beaver, Garfield, Iron, and Washington Counties during 1950 through 2025. No mapped path is shown in Kane County in Figure 41; this does not establish that tornado occurrence is impossible or that every event would have been observed and reported. Table 40 provides the verified 2000–2025 county-coded record; the older supplied path map is used only for historical location context.

Tornado occurrence is rated Likely for the five-county region, consistent with the plan's more than once in 10 years but less than annual category. The 10 reported event dates over the 26-year 2000–2025 period average approximately 0.38 reported tornado days per year. This historical reporting frequency supports a qualitative regional classification; it is not an annual occurrence probability or a county- or property-specific rate. The record does not support a separate probability for EF3-or-greater tornadoes. Future consequences depend on development, manufactured housing, warning access, shelter availability, and lifeline dependence.

Vulnerability Assessment

Tornado vulnerability in the five-county region is concentrated where a short, localized path intersects people, development, critical facilities, transportation corridors, utilities, or agricultural and visitor-serving assets. The verified 2000–2025 record includes three tornadoes in Beaver County, four in Garfield County, one in Iron County, two in Washington County, and none in Kane County; collectively, the records report no deaths or injuries and $300,000 in property damage. This history indicates generally low frequency but potentially meaningful localized consequences. Manufactured and older housing, large-span buildings, outdoor locations, schools, medical and public safety facilities, and areas with limited warning reception or shelter options are comparatively vulnerable. Countywide population, housing, and facility figures below provide planning context only and are not estimates of direct exposure, which would require a documented tornado-path or scenario overlay.

BEAVER COUNTY

Beaver County has documented tornado activity, including records near Milford in 2001 and 2009 and near Newhouse in 2012; all three events were rated F0 or EF0 and reported no deaths, injuries, or property or crop damage in Table 40. Future impacts would most likely be localized to developed areas such as Beaver, Milford, and Minersville or to exposed rural and agricultural sites. Roofs, siding, windows, manufactured homes, barns, outbuildings, fencing, irrigation components, vehicles, trees, and overhead utilities could be damaged even in a weak tornado.

Exposed assets include 7 Beaver County School District public schools serving 1,471 students, Beaver Valley Hospital, Milford Valley Memorial Hospital, public safety facilities, water and wastewater systems, electric and communications infrastructure, and Interstate 15 and connecting roads.

Cascading impacts: Damage to power or communications systems could interrupt homes, businesses, medical services, public safety operations, and water or wastewater facilities. Debris, overturned vehicles, or downed lines could block Interstate 15, state routes, or rural roads, delaying emergency response, mutual aid, repairs, and access to medical care. Outages could also disrupt irrigation, agricultural operations, cold storage, and temperature-controlled medicines, with greater consequences for isolated residents and facilities where service redundancy is limited.

Changes in development: Continued development near Interstate 15 and established communities may place additional housing, businesses, and public infrastructure within potential tornado paths. New manufactured housing, large-span buildings, and utility-dependent facilities could increase exposure if protective design, warning reception, and shelter access do not keep pace. Conversely, current building-code enforcement, resilient utility design, backup power, and incorporation of safe shelter areas into new or substantially improved facilities can limit growth in vulnerability.

GARFIELD COUNTY

Garfield County has four verified tornado records for 2000–2025, including events near Panguitch in 2000 and twice in 2016 and near Hatch in 2017. The September 22, 2016, EF1 Panguitch tornado accounts for the profile's reported $300,000 in property damage; the county's other records were rated F0, EF0, or EFU and reported no deaths or injuries. A future path through Panguitch, Escalante, Tropic, Boulder, Hatch, or a visitor-serving area could damage homes, businesses, lodging, campgrounds, schools, agricultural buildings, vehicles, trees, and overhead utilities.

Exposed community assets include 10 Garfield County School District public schools serving 1,509 students, Garfield Memorial Hospital in Panguitch, public safety and emergency response facilities, water and wastewater systems, and the U.S. 89 and State Route 12 corridors. Seasonal visitors in lodging, RV parks, campgrounds, and recreation areas may be unfamiliar with warnings and may lack substantial shelter.

Cascading impacts: Tornado damage to power, communications, or transportation infrastructure could interrupt medical care, public safety functions, water and wastewater service, school operations, and tourism activity. Debris or downed lines on U.S. 89, State Route 12, or local access roads could delay response, visitor movement, mutual aid, and delivery of repair crews and supplies. Agricultural effects could extend through damaged fencing, irrigation, livestock support systems, or loss of power, while business interruption and lodging closures could affect the tourism-dependent local economy.

Changes in development: Incremental growth in community centers and continued expansion of tourism-related lodging, recreation facilities, campgrounds, and supporting services can increase the number of residents, visitors, and assets exposed to localized wind damage. Development along constrained transportation corridors may also increase dependence on a limited number of access routes. Applying current codes, improving warning coverage, identifying shelter options at visitor-serving sites, and hardening utilities and critical facilities can reduce the vulnerability associated with future growth.

IRON COUNTY

Iron County's verified record includes an EF0 landspout near Cedar City and Enoch on April 18, 2025, with no reported deaths, injuries, or property or crop damage. The event confirms that localized tornadoes can affect the county even though the historical frequency is low. The greatest potential consequences would occur where a path intersects the concentrated development of Cedar City, Enoch, Parowan, or other communities, including residential neighborhoods, manufactured or student housing, schools, commercial areas, public buildings, and facilities along Interstate 15 or State Route 56.

Exposed assets include 18 Iron County School District schools serving 14,125 students, Intermountain Health Cedar City Hospital and its emergency department, university-related facilities, public safety and dispatch systems, utilities, and regionally important transportation and service centers.

Cascading impacts: Damage to electric, communications, traffic-control, water, or wastewater systems could disrupt residential areas, schools, university functions, medical care, businesses, and emergency

operations beyond the tornado path. Debris or downed lines on Interstate 15, State Route 56, and local roads could delay response and mutual aid and impair regional travel and freight movement. Because Cedar City functions as a regional service center, interruption of hospitals, government services, retail, lodging, or communications could affect residents and visitors from surrounding areas as well as Iron County.

Changes in development: Continued population and housing growth in and around Cedar City and Enoch, expansion along transportation corridors, and additional commercial, institutional, and student-oriented development will increase the number and value of assets potentially exposed to a narrow tornado path. Greater dependence on interconnected utilities and communications may also increase indirect consequences. Enforcing current wind-resistant construction provisions, addressing manufactured-housing shelter access, protecting critical systems, and incorporating shelter areas and backup power into new facilities can moderate this increase in vulnerability.

KANE COUNTY

No Kane County tornado record was returned in the 2000–2025 NCEI query, and no mapped path is shown for the county in Figure 41; these absences do not establish that tornado occurrence is impossible. Isolated weak tornadoes or landspout-type events may occur when severe thunderstorms develop. Potential direct impacts would be greatest in Kanab, Orderville, Glendale, Big Water, Alton, and other developed or visitor-serving areas, where localized winds and debris could damage roofs, windows, signs, manufactured housing, outbuildings, vehicles, trees, and overhead utilities.

Exposed assets include 10 Kane County School District schools serving 1,510 students, Kane County Hospital in Kanab, public safety and emergency response facilities, water and wastewater systems, and U.S. 89, U.S. 89A, State Route 9, and local access roads. Visitors in campgrounds, RV parks, lodging, and recreation areas may have limited shelter options or warning familiarity.

Cascading impacts: Damage to power, communications, or utility systems could interrupt the hospital, public safety operations, water and wastewater service, schools, businesses, and visitor facilities. Debris or downed lines on U.S. 89, U.S. 89A, State Route 9, or remote local roads could delay emergency access, visitor movement, mutual aid, and repairs. Closures of lodging, fuel, food, or recreation services could produce broader tourism and business impacts, while infrastructure damage in remote areas may take longer to identify and restore.

Changes in development: Population growth, seasonal visitation, and additional development in Kanab and along major travel corridors may increase exposure even if tornado frequency remains low. Expansion of lodging, RV parks, campgrounds, and recreation-support facilities may add occupants who lack nearby substantial shelter. Land-use decisions that maintain emergency access, warning coverage, and utility redundancy, together with code-compliant construction and identified shelter options in new visitor-serving and public facilities, can help prevent development-related increases in vulnerability.

WASHINGTON COUNTY

Washington County has two verified tornado records for 2000–2025: an EF0 event near Hurricane Airport in 2011 and an EFU event in the same area in 2017; neither record reports deaths, injuries, or property or crop damage. The county's comparatively large and concentrated development footprint means that a future tornado path could affect more people and assets than in less urbanized portions of the region. Areas of concern include St. George, Washington, Hurricane, Santa Clara, Ivins, and other growing communities, where housing, schools, hospitals, commercial centers, visitor facilities, and major transportation and utility systems are concentrated.

Exposed community assets include 55 Washington County School District schools serving 36,961 students, St. George Regional Hospital and its River Road Emergency Department, public safety facilities, dense residential and commercial development, water and wastewater systems, and Interstate 15, State Route 9, State Route 18, and key local roads.

Cascading impacts: Damage to electric, communications, water, wastewater, traffic-control, or medical-support systems could interrupt essential services well beyond the immediate path. Debris, damaged signals, overturned vehicles, or downed lines on Interstate 15 and major state or local routes could delay response, mutual aid, hospital access, school transportation, and regional travel. Outages and facility closures could displace residents, interrupt business and government operations, disrupt tourism and outdoor events, and impose disproportionate hardship on older adults, lower-income households, people with access and functional needs, manufactured-home residents, and visitors.

Changes in development: Rapid population growth and continued residential, commercial, institutional, and visitor-oriented expansion are increasing the number and value of assets within the county's developed footprint. Growth along Interstate 15 and other transportation corridors may increase both direct exposure and dependence on infrastructure that can be disrupted by a localized event. Applying current construction standards, providing shelter options in manufactured-housing communities and high-occupancy facilities, protecting critical utilities, preserving emergency access, and incorporating backup power and continuity measures into new development can reduce the increase in vulnerability.

Wildfire

Wildfire is an unplanned, unwanted fire burning in vegetated areas such as forests, shrublands, grasslands, or mixed wildland-urban interface (WUI) environments. Wildfire behavior and impacts are driven by the interaction of fuels, weather, and topography, and can range from low-intensity surface fires to fast-moving wind-driven fires and high-intensity crown fires. The 2024 Utah Enhanced State Hazard Mitigation Plan (SHMP) defines wildfire as an uncontrolled fire spreading through vegetative fuel and distinguishes wildland fires from WUI fires where structures and other development adjoin wildlands. At the national scale, wildfire is a recurring and seasonally predictable hazard, but year-to-year fire activity varies widely due to patterns of precipitation, drought, heat, wind, and lightning. The National Interagency Coordination Center (NICC) reports that, in 2025, there were 77,850 wildfires reported nationally and

these fires burned 5,131,474 acres.[106] The same national summary reports 18,385 structures destroyed by wildfires in 2025.

In the U.S. Southwest, wildfire risk is strongly shaped by arid-to-semiarid climates, highly seasonal precipitation, and periods of hot, dry, windy conditions that can rapidly dry fuels and support extreme fire behavior. Once a wildfire starts, vegetation (fuels), topography, and weather are key contributors to the rate of spread and overall fire growth, and that interannual variability in precipitation, snowpack, temperature, and fuel conditions can drive substantial variability in wildfire outcomes.[107]

In southwestern Utah specifically, wildfire is not limited to remote public lands; it is also a community hazard where development has expanded into fire-prone landscapes. This pattern is commonly described as the wildland-urban interface, the line, area, or zone where structures and other human development adjoin or intermingle with undeveloped wildland or vegetative fuels. The Utah SHMP classifies wildfire as either wildland (limited development) or WUI wildfire (where homes, infrastructure, and other built assets are exposed at the edge of or within vegetated fuels). The Five County AOG Hazard Mitigation Plan similarly defines the WUI as the zone where human development meets undeveloped wildlands, and notes that projected regional growth can increase both the number of people living in fire-prone areas and the number of residents unfamiliar with local fire risk.

Location

Wildfire can occur across all five counties in the Five County AOG planning area (Beaver, Garfield, Iron, Kane, and Washington Counties); however, the most consequential locations are those where burnable fuels overlap with communities, critical infrastructure, and high-use corridors.

Wildfire hazard potential refers to the relative likelihood of burning (burn probability) and related fire-environment conditions that support wildfire occurrence at a planning scale. Within the Five County AOG area, locations of greatest concern generally include (1) WUI areas around cities, towns, and resort and recreation communities where development and vegetation intermix; (2) transportation and utility corridors where ignition potential is elevated and where closures or damage can isolate communities and disrupt services; and (3) source watersheds and upland landscapes that support drinking water supplies and recreation assets, where wildfire can create longer-term downstream impacts.

Figure 42 through Figure 46 depict properties labeled as high-risk WUI properties in the supplied maps. The map legends identify Esri, CGIAR, USGS, and Utah DNR as sources, but the source-layer vintage, WUI definition, risk metric, classification threshold, and parcel-selection method are not documented. These maps are retained as qualitative screening illustrations; their labels do not establish verified WUI boundaries or an independently validated risk class. They provide screening context and do not establish

[106] National Interagency Coordination Center (NICC), *Wildland Fire Summary and Statistics Annual Report 2025* (National Interagency Fire Center, 2025), "National Fire Activity Synopsis" and "Structures Destroyed."
[107]Utah Division of Emergency Management, Utah Enhanced State Hazard Mitigation Plan (2024), Section 4.13, Wildfire Hazards, https://hazards.utah.gov/wp-content/uploads/WildfireChapterHMP.pdf.

quantified exposure of people, buildings, critical facilities, evacuation routes, utilities, or source watersheds.

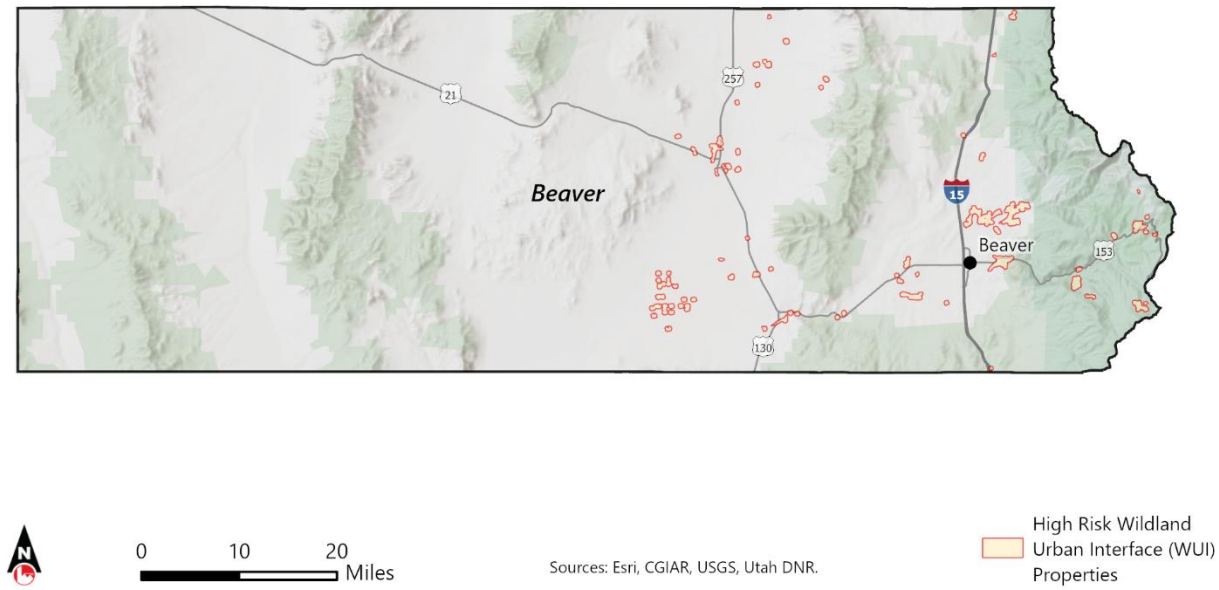


Figure 42: Beaver County High-Risk WUI Properties

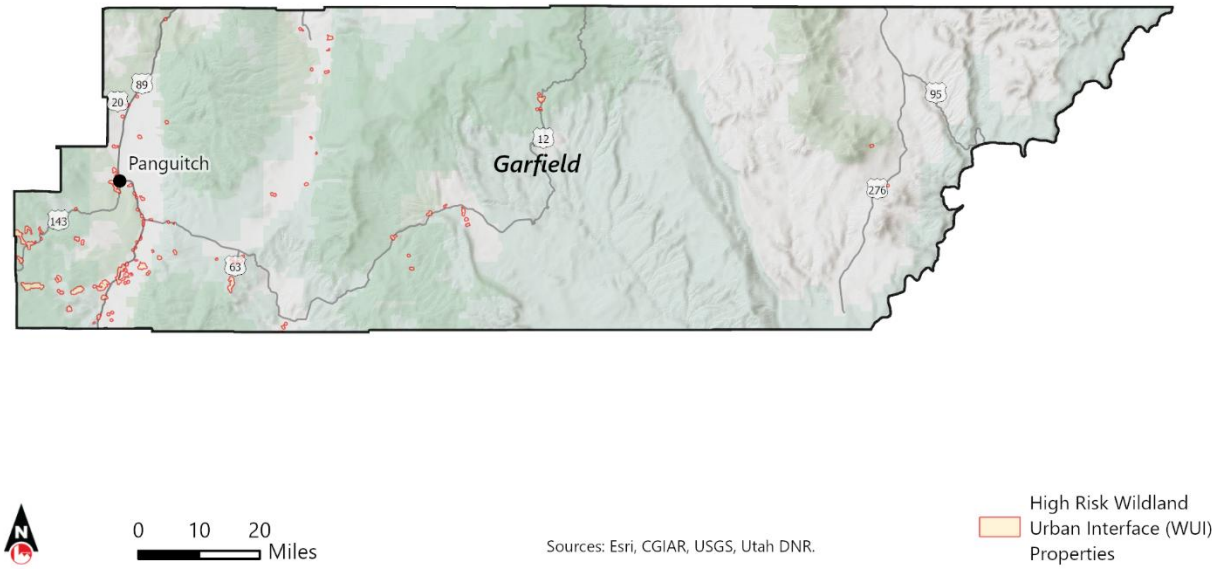


Figure 43: Garfield County High-Risk WUI Properties

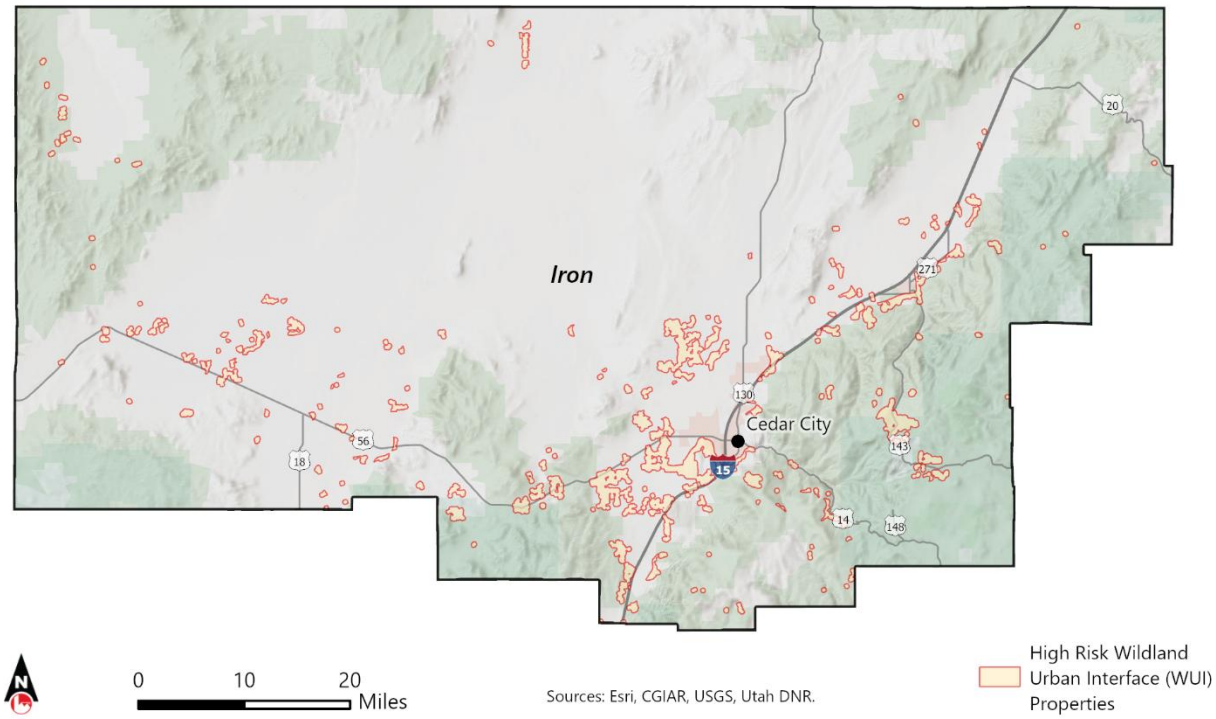


Figure 44: Iron County High-Risk WUI Properties

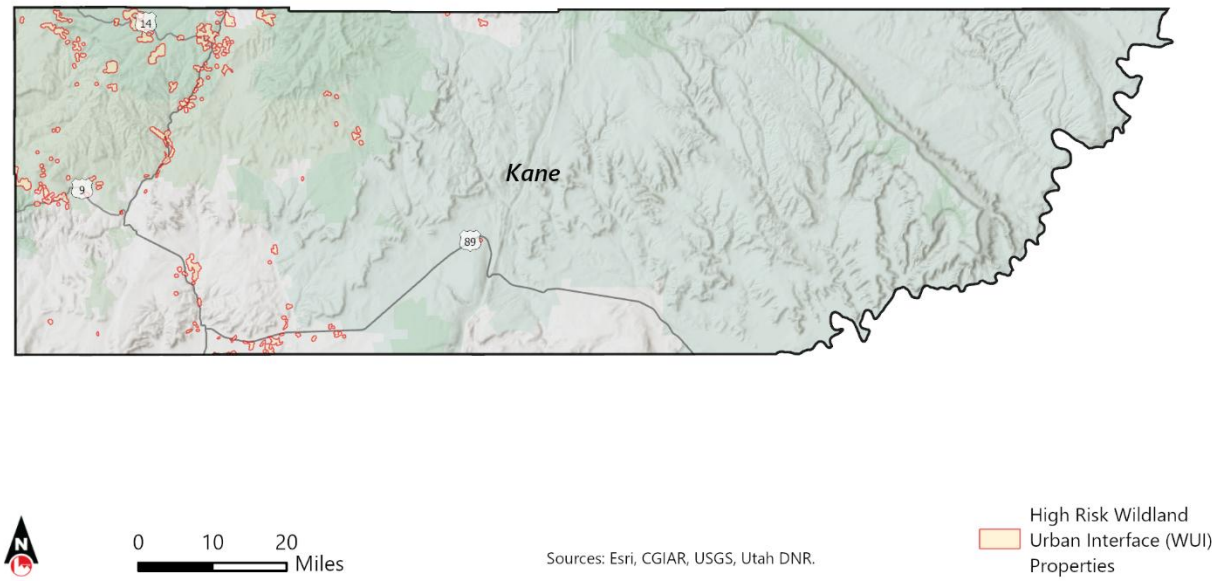


Figure 45: Kane County High-Risk WUI Properties

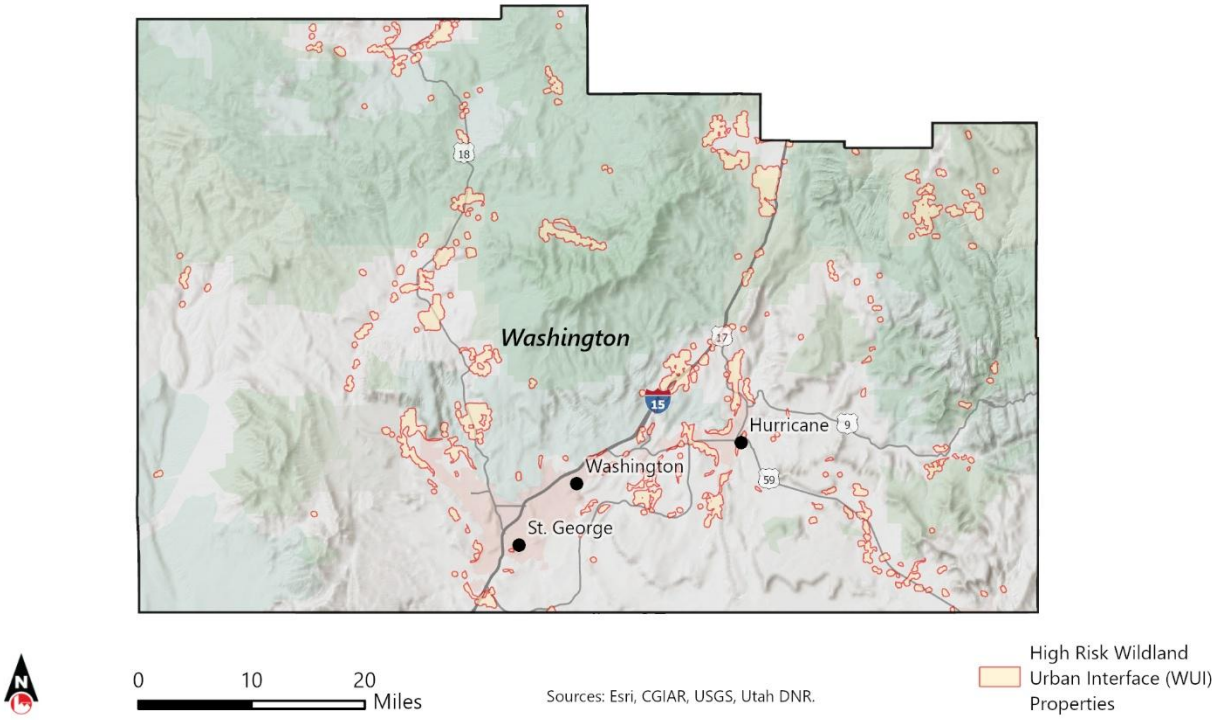


Figure 46: Washington County High-Risk WUI Properties

Magnitude and Extent

Wildfire extent includes the geographic area, intensity, and severity of an event. Fire-danger categories characterize potential ignition, spread, and suppression difficulty under prevailing conditions; they do not measure the acres, structures, people, or lifelines affected by a specific fire. Documented events are characterized, where data are available, by acreage, perimeter, duration, fire behavior or severity, structures affected, evacuations, smoke impacts, and community-lifeline disruption.

The following National Fire Danger Rating System adjective classes describe potential ignition, spread, and suppression difficulty under prevailing conditions:[108]

- **Low**: Grasses and brush do not ignite readily from small firebrands. Dead and down timber fires spread slowly on the ground with little danger of spotting.
- **Moderate**: Fires in open grasslands can burn briskly and spread rapidly on windy days. Timber fires spread slowly to moderately fast.
- **High**: Fires could easily start from most causes. Unattended brush and campfires are likely to escape with fire spreading rapidly. Short-distance spotting is common.
- **Very High**: Fires start easily from all causes and spread rapidly immediately after ignition and intensity increases quickly. Spot fires starting new fires is a constant danger.
- **Extreme**: All fires are potentially serious because fires start quickly, spread furiously, and burn intensely. It is often too dangerous for firefighters to engage with direct attack suppression tactics.

Previous Occurrences

The Five County AOG Region has experienced local and large multi-jurisdictional wildfires that burned substantial acreage, prompted evacuations and closures, damaged structures and infrastructure, affected smoke-sensitive populations and economic activity, and contributed to post-fire flooding, erosion, and watershed impacts. Table 41 lists identified federal Fire Management Assistance declarations and a state emergency order. Fire Management Assistance declarations provide context for significant response needs but are not a complete inventory of wildfire occurrence.

[108]Wildland Fire Application Information Portal, "Adjective Fire Danger Ratings," reviewed October 9, 2026, https://www.wildfire.gov/page/adjective-fire-danger-ratings/. The descriptions below summarize the published adjective classes, not event-specific damage or acreage.

Table 41: Wildfire Previous Disaster Declarations[109]

Year	Declaration Number	Declaration Type	Title and Description
2025	FM-5591-UT	Federal	Forsyth Fire, Washington County.
2025	EO 2025-08	State	State of emergency due to fires and the risk of additional fires during the 2025 fire season.
2021	FM-5388-UT	Federal	Mammoth Fire, Garfield County.
2020	FM-5321-UT	Federal	Veyo West Fire, Washington County.
2017	FM-5185-UT	Federal	Brian Head Fire, Iron County.
2016	FM-5130-UT	Federal	Saddle Fire, Washington County.
2012	FM-2994-UT	Federal	Shingle Fire, Kane County.
2009	FM-2831-UT	Federal	Mill Flat Fire, Washington County.
2005	FM-2564-UT	Federal	Blue Springs Fire, Washington County.
2004	FM-2521-UT	Federal	Brookside Fire, Washington County.

2025 WILDFIRE SEASON EVENTS

FRANCE CANYON FIRE (GARFIELD COUNTY)

The France Canyon Fire burned more than 2,159 acres near Bryce Woodlands in Garfield County in June 2025 and was reported at 0% containment (by June 16, 2025) while burning in very difficult terrain within the Dixie National Forest. According to reporting based on U.S. Forest Service updates, rugged and limited-access terrain complicated suppression operations, while dry fuels and forecast fire behavior increased concerns for additional growth. Smoke impacts occurred near Bryce Canyon National Park, Ruby's Inn, the Bryce Valley area, and Escalante, and the Bryce Woodlands community was placed on alert in case the fire moved south; however, no other communities or structures were reported as threatened at the time. Firefighting resources included approximately 180 personnel, hotshot crews, engines, hand crews, helitack crews, helicopters, and fixed-wing aircraft, and temporary National Forest System land closures were implemented to support public safety and suppression activities.[110]

109 FEMA, OpenFEMA Disaster Declarations Summaries, version 2, Utah records retrieved October 10, 2026. https://www.fema.gov/openfema-data-page/disaster-declarations-summaries-v2 FM-5591-UT (Forsyth) designates Washington County; FM-2994-UT (Shingle) designates Kane County. State EO 2025-08: https://governor.utah.gov/wp-content/uploads/2025-08-EO-State-Declaration-for-the-2025-Wildfires-1.pdf.

110 KUTV.com, Megan Brugger, "France Canyon Fire Burns Over 2100 Acres in 'Very Difficult Terrain' Near Bryce Woodlands," June 15, 2025, https://kutv.com/news/local/france-canyon-fire-burns-over-2100-acres-in-very-difficult-terrain-near-bryce-woodlands.

FORSYTH FIRE (WASHINGTON COUNTY)

The Forsyth Fire was reported near Pine Valley in Washington County on June 19, 2025. The NCEI event narrative describes a suspected holdover lightning ignition in the Pine Valley Mountains and hot, dry, windy conditions before discovery. It records evacuations of Pine Valley, Grass Valley, and Pinto, 14 homes and four outbuildings destroyed in Pine Valley, and 15,563 acres affected. The Southern Mountains forecast zone record reports $35 million in property damage; this is a reported event estimate, not an independently audited loss total.[111]

2026 WILDFIRE SEASON EVENTS

COTTONWOOD FIRE, JUNE–AUGUST 2026 (BEAVER COUNTY AND ADJACENT AREAS)

The 2026 wildfire season began under unusually severe fire-weather conditions across Utah, with drought, low fuel moisture, warm temperatures, and wind contributing to rapid fire growth well before the traditional late-summer peak. By mid-June, statewide wildfire reporting noted that wildfire activity was increasing earlier than usual, with multiple large fires burning across Utah and critical fire weather conditions forecast for much of the state.[112] These early conditions reflected the rapid drying of grasses, sagebrush, and other fine fuels that can carry fire quickly across open landscapes and into WUI areas.[113]

By July 22, 2026, the Governor of Utah reported that the Cottonwood Fire had burned more than 97,000 acres in Beaver and Piute Counties. Wildfires and subsequent flooding prompted evacuations and damaged State Route 153 in Beaver Canyon and water infrastructure serving Beaver and neighboring communities. The event demonstrates wildfire exposure, access disruption, and post-fire flood and debris-flow consequences.[114]

Low fuel moisture, low relative humidity, and strong winds can increase wildfire spread and suppression difficulty. NWS Red Flag Warnings identify dangerous fire-weather conditions; they do not quantify the perimeter or impacts of a particular wildfire.[115]

---

[111] NOAA National Centers for Environmental Information, Storm Events Database, annual details CSV files retrieved October 10, 2026. https://www.ncei.noaa.gov/pub/data/swdi/stormevents/csvfiles/ Wildfire Event 1278611, Southern Mountains forecast zone, beginning June 19, 2025.

[112] ABC4.com, Amelia Hobson and Ava Hart, "Most Destructive in State's History: Governor Cox Speaks on Cottonwood Fire, Which Has Burned Over 61,000 Acres," June 24, 2026, https://www.abc4.com/utah-weather/wildfire/cottonwood-fire-beaver-utah/.

[113] National Weather Service, Salt Lake City, "Extreme Fire Weather Southern Utah," 2026, https://www.weather.gov/slc/.

[114] Office of the Governor of Utah, Gov. Cox Declares State of Emergency for Beaver, Piute and Sevier Counties Following Wildfires and Catastrophic Flooding, July 22, 2026, https://governor.utah.gov/uncategorized/gov-cox-declares-state-of-emergency-for-beaver-piute-and-sevier-counties-following-wildfires-and-catastrophic-flooding/.

[115] National Weather Service, Fire Weather Watch and Red Flag Warning, https://www.weather.gov/safety/fire-weather.

On July 19, 2026, the National Weather Service issued a Flash Flood Emergency for Beaver after heavy rainfall over the Cottonwood Fire burn scar generated life-threatening flooding and debris flows. Runoff and debris moved down Beaver Canyon, overtopped a diversion dam, and continued along State Route 153 and the Beaver River toward the Grove area of Beaver City and North Creek, prompting evacuations and warnings for residents to move to higher ground. Reported impacts included major flooding in Beaver, debris and muddy floodwaters moving through residential areas, road and driveway washouts, water-quality concerns, and continuing transportation disruptions, illustrating how wildfire can rapidly transition into a post-fire flood and debris-flow hazard during subsequent storm events.

The 2026 events also triggered broader preparedness and risk-reduction actions across Utah. State officials issued emergency measures restricting fireworks during the Independence Day holiday period because of extreme fire danger,[116] and Rocky Mountain Power warned customers in several high-risk areas, including locations around Cedar City, Dixie, Enterprise Valley, Milford, Panguitch, and other central and southern Utah communities, of possible public safety power shutoffs.[117] Federal and state land managers also implemented fire restrictions on public and private lands, including Stage 1 restrictions across southwestern Utah counties and Stage 2 restrictions on Dixie and Fishlake National Forests and Bureau of Land Management lands. Together, these actions illustrate the regional scale of wildfire risk during the 2026 season and the potential for fire-weather conditions to affect transportation, utilities, recreation access, emergency response, and community preparedness even outside the immediate burn perimeter.

For the Five County AOG Region, the 2026 wildfire season underscores the continuing relevance of wildfire as a recurring, potentially high-consequence hazard. The Cottonwood Fire and associated red flag conditions demonstrate how quickly a wildfire can expand in southwestern Utah when dry fuels, low humidity, and strong winds align. They also show how wildfire impacts can extend beyond burned acreage to include evacuations, roadway closures, damage to recreation and residential assets, smoke impacts, utility concerns, and heightened demand on local, state, and federal response resources. These conditions reinforce the need for continued mitigation actions focused on defensible space, fuel reduction, public education, evacuation planning, utility resilience, interagency coordination, and post-fire recovery planning throughout Beaver, Garfield, Iron, Kane, and Washington Counties.

SAWMILL FIRE, JUNE 2026 (IRON COUNTY)

The Sawmill Fire was first reported on June 16, 2026, east of Steamboat Mountain and northwest of Lund in northern Iron County. The fire grew rapidly during its first operational periods as dry fuels, low relative humidity, and windy conditions supported fast spread across the fire area. Initial reports described the fire at approximately 100 acres, with growth to more than 2,000 acres within about a day and subsequent reporting indicating that the fire had exceeded 3,000 acres as crews continued suppression work.

[116] US News and World Report.com, Associated Press, "Utah Governor Restricts Fireworks as Largest US Wildfire Surges Uncontained," June 26, 2026, https://www.usnews.com/news/us/articles/2026-06-26/utah-governor-restricts-fireworks-as-largest-us-wildfire-surges-uncontained.
[117] ABC4.com, Derick Fox, "Rocky Mountain Power Issues Public Safety Power Shutoff Watch for Central, Southern Utah," June 20, 2026, https://www.abc4.com/news/southern-utah/rocky-mountain-power-wildfire-power-shutoff/.

As a precaution, the Iron County Sheriff's Office ordered the evacuation of several cabins and yurts on private land located within several miles of the fire. No homes were reported lost, and firefighters focused on structure protection while strengthening containment lines around the perimeter. Suppression resources included aircraft, engines, hand crews, and dozers, with crews working to secure fire edges, improve containment, and mop up hot spots as conditions allowed.[118]

The Sawmill Fire also produced community-level impacts beyond the active burn area. Residents in western and northern Iron County were advised that smoke could remain visible, and fire managers cautioned that gusty winds, possible thunderstorms, hot temperatures, and dry vegetation could continue to influence fire behavior. These conditions illustrate how wildfire in Iron County can affect dispersed rural properties, recreation cabins, access routes, emergency response resources, and nearby communities even when primary residences are not directly damaged.[119]

Within the broader 2026 wildfire season, the Sawmill Fire demonstrates Iron County's continued exposure to fast-moving wildfire under severe early-season fire-weather conditions. The event reinforces the importance of defensible space around seasonal and rural structures, timely public warning systems such as reverse 911 alerts, pre-identified evacuation routes, interagency suppression coordination, and continued fuel-reduction and public education measures in the county's WUI and rural recreation areas.[120]

PREVIOUS HAZARD EVENTS IN FIVE COUNTY REGION FROM NCEI DATABASE

Table 42 presents two verified NCEI Wildfire records during the January 1, 2020–May 31, 2026, review period: the October 29, 2023, brush fire near Leeds and the June 19, 2025, Forsyth Fire. The events are forecast-zone records; their narratives identify the affected locations in Washington County. NCEI is not a complete wildfire-incident inventory. No France Canyon record was returned in the reviewed Utah Wildfire-coded bulk data; that absence does not establish that the fire did not occur. Cottonwood and Sawmill occurred after the query end date and are described separately.

[118] Iron County Today, "Sawmill Fire Continues Burning in Northern Iron County," June 24, 2026 (URL date), updated June 26, 2026, 2:00 p.m., https://ironcountytoday.com/2026/06/24/sawmill-fire-continues-burning-in-northern-iron-county/.
[119] Iron County Today, "Sawmill Fire Continues Burning in Northern Iron County," June 24, 2026 (URL date), updated June 26, 2026, 2:00 p.m., https://ironcountytoday.com/2026/06/24/sawmill-fire-continues-burning-in-northern-iron-county/.
[120] Iron County Today, "Sawmill Fire Continues Burning in Northern Iron County," June 24, 2026 (URL date), updated June 26, 2026, 2:00 p.m., https://ironcountytoday.com/2026/06/24/sawmill-fire-continues-burning-in-northern-iron-county/.

Table 42: Selected Verified NCEI Storm Events Database Wildfire Records, January 2020–May 2026[121]

Date	Event Type	Location	Magnitude	Fatalities	Injuries	Property Damage	Crop Damage
10/29/2023	Wildfire	Near Leeds / Lower Washington County Zone	N/A	0	0	$50,000	$0
6/19/2025	Wildfire	Forsyth / Southern Mountains	N/A	0	0	$35,000,000	$0

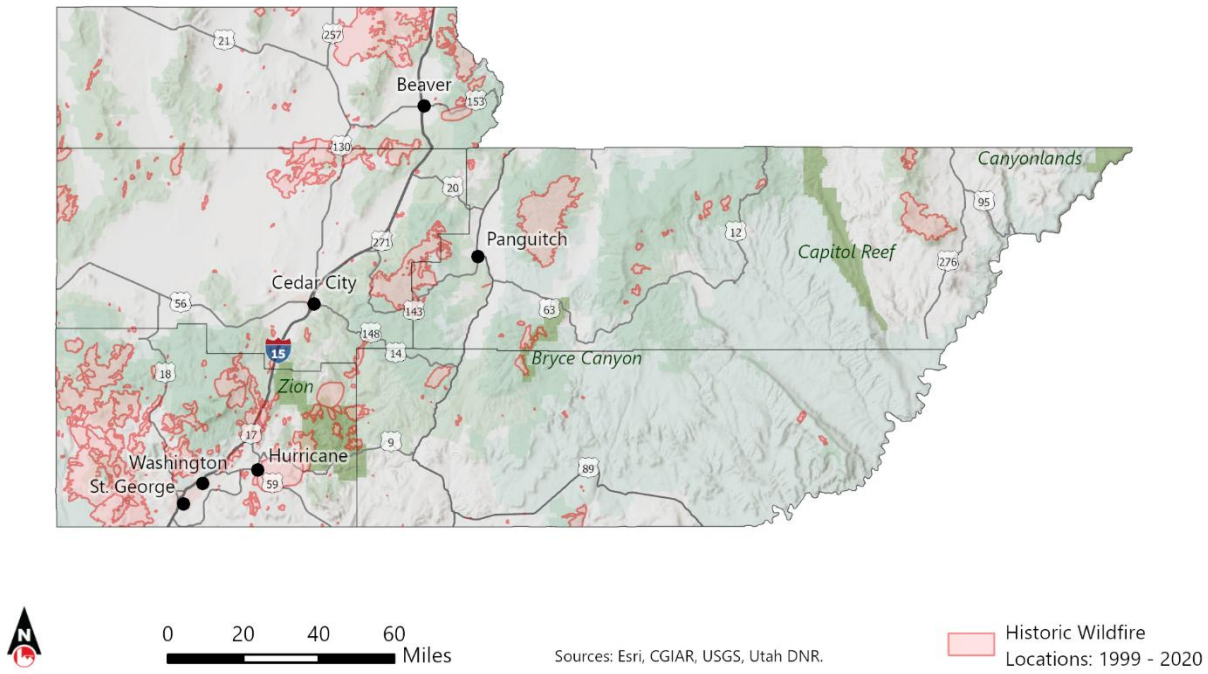


Figure 47: Historic Wildfire Events for the Five-County Region (1999–2020)

Figure 47 shows mapped historic wildfire locations for 1999 through 2020 and provides long-term geographic context. Later incidents are described separately because they fall outside the map period. Proximity to a mapped perimeter does not by itself establish asset exposure or impact; direct exposure requires a documented intersection or distance analysis.

[121] NOAA National Centers for Environmental Information, Storm Events Database, annual details CSV files retrieved October 10, 2026. https://www.ncei.noaa.gov/pub/data/swdi/stormevents/csvfiles/, Wildfire Events 1140822 and 1278611. Event narratives identify the locations; zone boundaries do not provide county-level loss allocations.

Probability of Future Occurrences

The probability score is Highly Likely (expected to occur one or more times per year, based on the source and period of record identified in this hazard profile). Wildfire is expected to occur within the Five County AOG planning area during the five-year planning horizon and is likely to occur in any given year somewhere in the region due to the area's documented fire history, persistent seasonal fire-weather patterns, continued growth in the WUI, and the presence of widespread areas mapped with elevated wildfire hazard potential (i.e., relative likelihood of burning) in statewide wildfire risk assessment products. These hazard potential maps do not predict where the next ignition will occur; instead, they provide a defensible basis for concluding that, across the planning area, conditions that support wildfire occurrence will persist and periodically align with ignition sources and extreme weather, producing damaging events. In terms of anticipated intensities, future wildfire occurrence is expected to include a range of conditions, from frequent small fires (often lower-intensity) to occasional large incidents under severe weather that can exhibit high-intensity behavior and produce regional smoke, evacuations, and infrastructure disruptions.

State and regional planning documents support a Highly Likely rating for future wildfire occurrence in southwestern Utah. The Utah SHMP concludes that, although wildfire activity varies substantially year to year, the occurrence of wildfire across Utah is near certain and notes that southwestern and central Utah have among the highest probabilities of experiencing wildfire in any one year, based on NRI probability mapping.

Recent fire history and state planning information support continued wildfire occurrence during the five-year planning horizon. The Fifth National Climate Assessment (NCA5) reports that higher temperatures have intensified drought and will contribute to a more arid Southwest, and it identifies increases in drought, wildfire activity, and related health impacts. NCA5 also reports more intense precipitation events in the Southwest, which supports consideration of post-fire flooding and debris-flow consequences. These regional findings strengthen the basis for climate-informed mitigation but do not quantify a uniform change in fire frequency, acreage, or severity for every Five County jurisdiction.[122]

Vulnerability Assessment

In southwestern Utah, wildfire vulnerability is shaped by the combination of fire-prone landscapes, recurring hot, dry, and windy conditions, and continued growth in communities and infrastructure located near vegetated areas. This assessment considers the people, buildings, critical facilities, infrastructure, economic assets, natural resources, and community functions that may be affected by wildfire, as well as the secondary and long-term consequences that can follow a fire. Across the Five County Region, vulnerability is generally greatest where wildland fuels overlap with homes, transportation corridors, utilities, recreation areas, grazing lands, and watershed resources, particularly in WUI areas where evacuation challenges, structure exposure, smoke impacts, and post-fire flooding or erosion can

[122] U.S. Global Change Research Program, Fifth National Climate Assessment, Chapter 28, Southwest, 2023.

compound losses. The county-level discussions below describe how regional wildfire conditions translate into specific local vulnerabilities within the planning area.

BEAVER COUNTY

Beaver County's wildfire vulnerability reflects extensive grass, shrub, pinyon-juniper, and forest fuels; recurrent hot, dry, and windy conditions; and dispersed communities, agricultural lands, recreation areas, and infrastructure located near burnable vegetation. WUI areas and road corridors around Beaver, Milford, Minersville, and rural development are of greatest concern because fast-moving fire can threaten structures, constrain evacuation and emergency access, and interrupt utilities and communications across a large service area. Exposed assets include homes, businesses, schools, government and public works facilities, Beaver Valley Hospital, the Sheriff's Office and dispatch functions, fire stations in Beaver, Milford, and Minersville, roads and bridges, power and communications systems, water infrastructure, grazing lands, watersheds, and recreation assets.

Wildfire could cause injury or loss of life; destroy homes, outbuildings, fencing, and public or private facilities; damage utilities and transportation infrastructure; and close roads needed for evacuation and response. Smoke and service interruptions could affect schools, outdoor workers, medically sensitive populations, agriculture, tourism, recreation, and local businesses. The county's broad geography and limited number of critical service nodes can magnify consequences if a hospital, fire station, water system, communications site, or connecting corridor is impaired.

Cascading impacts: Damage to electrical, communications, transportation, and water infrastructure can isolate residents, delay response and reentry, and disrupt essential services and agricultural operations beyond the burn perimeter. Loss of vegetation can increase runoff, erosion, sedimentation, and debris-flow potential during later storms, threatening roads, culverts, irrigation works, water systems, and downstream property. The 2026 Cottonwood Fire and subsequent flooding in Beaver Canyon illustrate how wildfire can transition rapidly into access, water-quality, and post-fire flood emergencies.

Changes in development: Continued residential, agricultural, utility, and recreation-related development near vegetated lands can increase the number and value of exposed assets, add ignition sources, and place additional demand on warning, evacuation, fire suppression, and water systems. New or infill development along limited-access corridors may also increase evacuation congestion and response travel times. Applying defensible-space, ignition-resistant construction, access, water-supply, and vegetation-management standards as growth occurs can reduce the extent to which future development increases wildfire vulnerability.

GARFIELD COUNTY

Garfield County is vulnerable to wildfire because extensive vegetated public and private lands, rugged terrain, recurring drought and severe fire weather, and dispersed communities overlap across a very large area. Communities including Panguitch, Escalante, Boulder, Hatch, and Tropic, as well as development near Bryce Canyon and other recreation destinations, contain homes, visitor facilities, utilities, and

transportation routes adjoining grass, shrub, pinyon-juniper, and forest fuels. WUI conditions, steep terrain, and limited access can complicate suppression and evacuation.

Bryce Canyon National Park recorded 1,967,367 recreation visits in 2025, adding substantial seasonal population and travel demand. Exposed assets include housing, lodges, campgrounds, businesses, schools, Garfield Memorial Hospital, Sheriff and ambulance functions, municipal and volunteer fire departments, highways and local roads, utilities, grazing lands, watersheds, and public-land recreation resources.

Wildfire could threaten life safety; damage homes, outbuildings, lodges, campgrounds, fencing, utilities, and public facilities; and close roads needed for evacuation, emergency access, and visitor travel. Smoke, power or communications outages, and protective closures could interrupt schools, medical access, public services, grazing, tourism, and recreation. Because visitor-serving activity and public-land access are central to the local economy, even a fire that does not destroy structures can reduce business revenue and disrupt employment.

Cascading impacts: Fire or smoke affecting highways, local roads, communications, power, or water systems can isolate communities, delay response and reentry, and interrupt visitor movement and essential services. Burning on steep terrain can remove vegetation and destabilize soils, increasing runoff, erosion, sedimentation, post-fire flooding, and debris-flow potential during later storms. These effects can threaten roads, culverts, water systems, campgrounds, downstream property, and watershed function for multiple seasons after containment.

Changes in development: Additional housing and visitor-serving development in or near vegetated areas can expand the WUI, increase seasonal evacuation loads, and place more structures and infrastructure along constrained travel corridors. Growth near recreation gateways may also increase dependence on a small number of highways and utility systems. Coordinating land-use review with defensible-space, ignition-resistant construction, emergency access, water-supply, evacuation, and fuel-management requirements can limit the vulnerability created by future development.

IRON COUNTY

Iron County's wildfire vulnerability results from extensive grass, shrub, pinyon-juniper, and forest fuels; recurring hot, dry, and windy conditions; and continued growth in and near fire-prone landscapes. Cedar City, Enoch, Parowan, Paragonah, Brian Head, and rural residential and recreation areas contain homes, businesses, critical facilities, and transportation and utility corridors that adjoin burnable vegetation. Prior events, including the Brian Head Fire and the 2026 Sawmill Fire, demonstrate the potential for rapid growth, evacuations, structure exposure, and prolonged recovery needs.

Iron County welcomed approximately 1.6 million visitors in 2025, with estimated local spending of $251.6 million. Exposed assets include homes, businesses, schools, Southern Utah University facilities, Cedar City Hospital, Sheriff and dispatch functions, municipal and volunteer fire departments, highways, utilities, communications sites, water systems, grazing lands, watersheds, and recreation resources.

Wildfire could cause casualties; destroy homes, outbuildings, businesses, and public facilities; damage roads, utilities, communications equipment, and water systems; and impede evacuation or emergency access. Smoke, closures, and utility failures could disrupt schools and university operations, medical care, commuting, tourism, recreation, and commerce. Concentrated growth around Cedar City and Enoch and dispersed exposure near Brian Head and rural areas create different operational demands but can draw on the same regional response resources.

Cascading impacts: Damage or shutdowns affecting highways, local roads, power, communications, or water networks can isolate neighborhoods, interrupt emergency response, and disrupt education, workforce mobility, visitor travel, and essential services. Fire on steep slopes and in source watersheds can increase erosion, sedimentation, runoff, post-fire flooding, and debris flows, threatening culverts, roads, water infrastructure, recreation areas, and downstream property after the fire is contained.

Changes in development: Rapid population and housing growth, continued expansion at community edges, and recreation-oriented development can enlarge the WUI and increase the number of residents, visitors, and assets requiring protection and evacuation. New development can also increase ignition potential and demands on roads, dispatch, suppression, and water supplies. Integrating wildfire hazard information into siting and subdivision review, while requiring defensible space, ignition-resistant materials, secondary access, adequate fire flow, and long-term vegetation maintenance, can reduce growth-related increases in vulnerability.

KANE COUNTY

Kane County is vulnerable to wildfire because extensive vegetated landscapes, prolonged drought and severe fire weather, rugged terrain, and widely dispersed communities overlap with homes, visitor facilities, transportation corridors, and utilities. Kanab, Orderville, Alton, Glendale, Big Water, Mount Carmel, and rural recreation areas contain development adjoining grass, shrub, pinyon-juniper, and forest fuels. WUI conditions and long travel distances can complicate warning, evacuation, suppression, and continuity of essential services.

Exposed assets include homes, lodges, campgrounds, businesses, schools, Kane County Hospital, Sheriff and 911 functions, fire and EMS agencies, highways and local roads, power and communications systems, water infrastructure, grazing lands, watersheds, and public-land recreation resources.

Wildfire could threaten life safety; damage homes, outbuildings, visitor facilities, utilities, public buildings, and transportation infrastructure; and close routes needed for evacuation, community connectivity, supply movement, and visitor travel. Smoke, outages, and access restrictions could interrupt medical care, schools, public services, tourism, recreation, and local business activity. Because the economy depends heavily on outdoor recreation and public-land access, wildfires both within and outside the county can create substantial indirect losses when regional routes or destinations close.

Cascading impacts: Fire, smoke, or damage affecting highways, local roads, communications, power, or water systems can isolate communities, delay response and reentry, and interrupt essential services and visitor movement. Loss of vegetation on steep or erodible terrain can increase runoff, erosion,

sedimentation, post-fire flooding, and debris-flow potential during later storms, threatening roads, culverts, campgrounds, water systems, and downstream property for multiple seasons.

Changes in development: Continued residential and tourism-related development near vegetated areas can expand the WUI, increase seasonal evacuation demand, and place more assets along a limited network of roads and utilities. Growth around Kanab and recreation gateways may increase exposure even where countywide density remains low. Hazard-informed siting, defensible space, ignition-resistant construction, reliable secondary access, adequate fire flow, evacuation planning, and sustained fuel management can reduce the vulnerability added by future development.

WASHINGTON COUNTY

Washington County's wildfire vulnerability reflects rapid population growth, extensive WUI development, fire-prone grass, shrub, and pinyon-juniper fuels, and recurring hot, dry, and windy conditions. St. George, Washington, Hurricane, Santa Clara, Ivins, and smaller communities including Pine Valley, Diamond Valley, Veyo, Gunlock, Brookside, and Central contain neighborhoods, businesses, critical facilities, and transportation and utility corridors adjoining burnable vegetation. Recent events, including the Forsyth Fire, demonstrate the potential for evacuations, structure loss, smoke, and high-consequence community impacts.

Exposed assets include homes, businesses, schools, St. George Regional Hospital, public health facilities, Sheriff and 911 functions, municipal and volunteer fire departments, highways and local roads, power and communications systems, reservoirs and water infrastructure, and Greater Zion recreation resources.

Wildfire could cause casualties; destroy homes, outbuildings, businesses, and public facilities; damage transportation, utility, communications, and water infrastructure; and force large or complex evacuations. Smoke, road closures, and power or communications disruptions could affect schools, medical and public health services, commuting, tourism, recreation, supply movement, and business continuity. High population and visitor volumes increase the consequences of disruptions along key corridors and the demand placed on emergency services and shelters.

Cascading impacts: Damage or shutdowns affecting roads, power, communications, reservoirs, or water and wastewater systems can delay response and reentry, isolate neighborhoods, and interrupt essential services across the county. Burning in watersheds and on steep terrain can increase runoff, erosion, sedimentation, post-fire flooding, and debris-flow potential, threatening roads, culverts, reservoirs, water systems, recreation areas, and downstream neighborhoods long after containment. Smoke and protective closures can also produce countywide public-health and economic effects beyond the fire perimeter.

Changes in development: Rapid residential and commercial expansion at community edges can enlarge the WUI, increase the value and density of exposed property, add ignition sources, and create greater evacuation and suppression demands. Infill and new subdivisions may also increase congestion on constrained routes and dependence on shared utility and water systems. Integrating wildfire risk into land-use and subdivision review and requiring defensible space, ignition-resistant construction, adequate

access and fire flow, evacuation connectivity, and long-term vegetation maintenance can reduce development-driven increases in vulnerability.

Winter Storms

Winter storms encompass heavy snowfall, freezing rain, ice, sleet, and blizzards. These storms vary in intensity and size, posing significant risks, especially when accompanied by extremely cold temperatures and strong winds. Winter storms are characterized by varying intensity, duration, and weather conditions that can significantly affect communities. Snowfall rate varies by storm and location. Higher snowfall rates can produce rapid accumulation and reduced visibility, but no single rate defines every winter storm addressed in this profile. Winter storms may last only a few hours or extend over several days, and prolonged events can compound impacts on transportation, infrastructure, and emergency services, while also increasing the risk of flooding during melt periods.

Winter storms are often accompanied by hazardous weather conditions that intensify their impact. Blizzard conditions require sustained wind or frequent gusts of at least 35 mph, considerable falling or blowing snow that frequently reduces visibility below one-quarter mile, and persistence for at least three hours. Poor visibility and treacherous road conditions make driving hazardous for both motorists and first responders. Heavy snowfall can cause roofs and power lines to collapse, resulting in prolonged power outages. Those without adequate shelter during these storms are at risk of frostbite, hypothermia, or even death. Cold temperatures also contribute to icy road conditions that endanger travel. In some cases, snowstorms are preceded by or transition into freezing rain, leading to ice accumulation on surfaces, fallen branches, and potential power outages due to ice-laden trees and utility lines.

Location

Winter storm impacts occur throughout the five-county region, though their spatial distribution is strongly influenced by elevation, terrain, and transportation infrastructure.

In Beaver County, winter storms are concentrated in higher-elevation areas and mountainous terrain, particularly along the Interstate 15 corridor west of the Tushar Mountains and surrounding plateaus, where elevations exceed 5,500 feet and support frequent snowfall, blowing snow, and extreme cold; these impacts affect rural communities and major freight and travel routes.

Garfield County experiences winter storm impacts across its extensive high-elevation plateaus, mountainous areas, and remote road networks, including portions of the Aquarius Plateau and Boulder Mountain, where elevations above 7,000 feet contribute to prolonged snow cover and isolation of small population centers and unincorporated areas.

In Iron County, winter storms affect both valley population centers, including Cedar City, and higher-elevation terrain surrounding the community; impacts are especially concentrated along Interstate 15, state highways, and mountain passes where elevation changes, snow squalls, and rapid visibility reductions create hazardous travel conditions.

Kane County experiences winter storm impacts primarily in higher-elevation areas and along key transportation corridors such as U.S. Highway 89 and State Route 9, which traverse mountainous terrain and serve as critical access routes; lower-elevation communities in the county are more likely to experience freezing rain and icy road conditions rather than sustained snowfall.

Washington County generally experiences winter storm impacts in its higher-elevation areas, including the Pine Valley Mountains and northeastern portions of the county, while lower-elevation population centers such as St. George experience less frequent snow; however, even minor winter weather events in these lower elevations can disrupt travel on arterial roadways and access routes connecting to higher terrain. Overall, winter storm locations across the Five County AOG Region are closely aligned with elevation gradients, mountain ranges, and major transportation corridors, with higher elevations experiencing more frequent and severe winter conditions and lower elevations experiencing episodic but disruptive winter weather events.

Magnitude and Extent

The extent of severe winter weather can be classified using meteorological measurements and by evaluating its societal impacts. The NWS Winter Storm Severity Index (WSSI) communicates the general level and spatial distribution of potential societal impacts based on the official forecast. It considers snow amount, snow load, ice accumulation, and blowing snow. The WSSI does not depict official warnings, is not a specific forecast of individual impacts, and should be used with other NWS forecasts and warnings.

Table 43: Winter Storm Severity Index[123]

Impacts	Potential Winter Storm Impacts
Minor	• Expect a few inconveniences to daily life. › Winter driving conditions. Use caution while driving.
Moderate	• Expect disruptions to daily life. › Hazardous driving conditions. Use extra caution while driving. › Closures and disruptions to infrastructure may occur.
Major	• Expect considerable disruptions to daily life. › Dangerous or impossible driving conditions. Avoid travel if possible. › Widespread closures and disruptions to infrastructure may occur.
Extreme	• Expect substantial disruptions to daily life. › Extremely dangerous or impossible driving conditions. Travel is not advised. › Extensive and widespread closures and disruptions to infrastructure may occur. › Life-saving actions may be needed.

[123] National Oceanic and Atmospheric Administration, National Weather Service, Weather Prediction Center, "The Winter Storm Severity Index," 2026, https://www.wpc.ncep.noaa.gov/wwd/wssi/wssi.php

Previous Occurrences

Historical information indicates that winter weather occurs across the five-county region and can produce hazardous travel, roadway closures, infrastructure damage, power outages, injuries, and fatalities. Historical records from FEMA disaster declarations (see Table 44) and NOAA NCEI storm events show that winter weather has affected multiple counties throughout the region, particularly along major transportation corridors and in higher-elevation communities. These past events help illustrate the frequency, geographic extent, and consequences of winter storms in the region and provide an important foundation for evaluating current vulnerability and future risk.

Table 44: Winter Storms Previous Disaster Declarations[124]

Year	Declaration Number	Declaration Type	Title and Description
2011	DR-1955-UT	Federal	Severe Winter Storm and Flooding; Garfield, Kane, and Washington Counties. Incident: December 20–24, 2010; declared February 11, 2011.

The reviewed Utah OpenFEMA records identify DR-1955-UT as the winter-storm-titled declaration with designated counties in the planning area. Other winter-storm-titled Utah declarations designated counties outside this region. Declaration records are not a complete winter-weather occurrence inventory.

PREVIOUS HAZARD EVENTS IN FIVE COUNTY AOG REGION FROM THE NCEI DATABASE

Table 45 presents selected verified Winter Storm, Winter Weather, and Heavy Snow records for the Southwest Utah and South Central Utah forecast zones from January 1, 2020, through May 31, 2026. Zone records may span county boundaries and are not allocated to individual jurisdictions. Fatalities and injuries include both direct and indirect casualties reported in each record; reported losses are not a complete accounting of actual impacts.

[124] FEMA, OpenFEMA Disaster Declarations Summaries, version 2, Utah records retrieved October 10, 2026. https://www.fema.gov/openfema-data-page/disaster-declarations-summaries-v2 DR-1955-UT: incident December 20–24, 2010; declaration February 11, 2011; designated planning-area counties Garfield, Kane and Washington. OpenFEMA title: Severe Winter Storm and Flooding.

Table 45: Selected NCEI Storm Events Database Winter Weather Records, 2020–May 2026[125]

Date	Event Type	Location	Magnitude	Fatalities	Injuries	Property Damage	Crop Damage
10/12/2021	Winter Storm	Southwest Utah (Zone)	N/A	0	0	$100,000	$0
2/13/2023	Winter Weather	Southwest Utah (Zone)	N/A	0	1	$500,000	$0
2/13/2023	Winter Weather	South Central Utah (Zone)	N/A	0	1	$50,000	$0
3/21/2023	Winter Weather	South Central Utah (Zone)	N/A	3	1	$40,000	$0
4/3/2023	Heavy Snow	Southwest Utah (Zone)	N/A	0	0	$175,000	$0
1/6/2024	Winter Weather	Southwest Utah (Zone)	N/A	1	3	$50,000	$0
2/13/2024	Winter Weather	Southwest Utah (Zone)	N/A	0	0	$1,000,000	$0
2/13/2024	Winter Weather	South Central Utah (Zone)	N/A	0	1	$75,000	$0
2/17/2026	Winter Storm	Southwest Utah (Zone)	N/A	0	0	$80,000	$0
2/18/2026	Winter Weather	Southwest Utah (Zone)	N/A	0	2	$300,000	$0

Probability of Future Occurrences

Winter storms are a recurring hazard in southwestern Utah and have caused transportation disruption, infrastructure damage, power outages, injuries, and fatalities. Winter weather is rated Highly Likely for occurrence somewhere in the region, consistent with the plan's annual-or-more-frequent category and recurring cold-season conditions documented in the reviewed regional NOAA records. This qualitative regional rating is not an annual probability calculated from the selected loss table or a uniform rate for every county or elevation. The Utah Enhanced State Hazard Mitigation Plan identifies winter storms as part of the state's severe weather profile, and the state's severe weather chapter notes that, in Utah, winter storms cause more weather-related deaths than any other hazard. For the five-county region, the probability of future winter storm occurrence is influenced by elevation, topography, and exposure along

[125] NOAA National Centers for Environmental Information, Storm Events Database, annual details CSV files retrieved October 10, 2026. https://www.ncei.noaa.gov/pub/data/swdi/stormevents/csvfiles/, Event IDs in table order: 989432, 1084037, 1084038, 1088869, 1095837, 1150637, 1163302, 1163303, 1306219, 1306284. Event 1084037 reports 500.00K ($500,000) in property damage. Table casualties sum the direct and indirect fields.

major travel corridors, with snow, cold, and travel impacts varying across higher- and lower-elevation areas of all five counties. Based on the state plan and historical regional experience, winter storms are expected to remain a recurring hazard in southwestern Utah, with future events continuing to produce snowfall, blowing snow, icy roads, extreme cold, and related secondary impacts.[126]

The following county summaries describe elevation-dependent winter conditions and potential impacts within the regional Highly Likely classification; comparative county probabilities are not calculated.

- Beaver and Garfield Counties can experience moderate to major winter storm impacts due to their higher elevations and colder winter temperatures, which support frequent snowfall, prolonged snowpack persistence, and hazardous travel conditions; these counties are more likely to experience heavy snow, blowing snow, and extreme cold that can disrupt transportation and utilities.
- Iron County experiences winter weather in valley and higher-elevation areas, including snowstorms, snow squalls, and freezing conditions capable of producing roadway and infrastructure disruption.
- Kane County experiences winter storms, with impacts varying considerably by elevation; higher-elevation areas are more susceptible to heavy snowfall and winter travel hazards, while lower elevations may experience freezing rain, brief snow events, and icy conditions.
- Washington County experiences less frequent snow accumulation in its lower-elevation communities because winter temperatures are generally warmer there; however, winter storms do occur periodically, particularly in higher-elevation areas, and can still produce snow, ice, and transportation disruptions.

NCA5 concludes that warming has already decreased western snowpack and will continue to do so, with a greater share of precipitation falling as rain rather than snow, reduced snow extent, earlier snowmelt, and more rain-on-snow events. These changes may reduce average snowpack, particularly at lower elevations, while individual winter storms and cold-weather disruptions will continue to occur. Future vulnerability depends on changing precipitation phase, elevation-dependent snow, earlier melt, rain-on-snow and flooding potential, development, transportation dependence, and utility and heating needs.[127]

[126] NOAA National Centers for Environmental Information, Storm Events Database, annual details CSV files retrieved October 10, 2026. https://www.ncei.noaa.gov/pub/data/swdi/stormevents/csvfiles/ Regional history check: Winter Weather, Winter Storm and Heavy Snow records for the Southwest Utah and South Central Utah forecast zones, January 1, 2000–December 31, 2025. The query returned 85 records in 18 consecutive calendar years (2007–2024); records are not independent storms or county-level probabilities.

[127] U.S. Global Change Research Program, Fifth National Climate Assessment, 2023, Chapters 4 and 28; U.S. Global Change Research Program, Fifth National Climate Assessment (2023), Chapter 28, Southwest. https://nca2023.globalchange.gov/chapter/28/. Regional findings do not establish a uniform change in local winter-storm intensity.

Table 46: Regional Probability and Future Winter Storm Conditions by County

County	Regional Probability Basis	Anticipated Winter Storm Type	Anticipated Intensity and Impacts
Beaver County	Highly Likely regionally; local occurrence varies with elevation.	Heavy snowfall, blowing snow, extreme cold, prolonged snowpack	Due to higher elevations and colder winter temperatures, Beaver County can experience moderate to major winter storm impacts. Future storms are expected to produce heavy snowfall, reduced visibility, hazardous travel conditions, and increased risk of power outages and infrastructure disruptions, particularly impacting transportation corridors.
Garfield County	Highly Likely regionally; local occurrence varies with elevation.	Snowstorms, heavy snow, extreme cold, winter weather events	Garfield County's high elevations and rural road network contribute to winter storm impacts. Anticipated intensities range from moderate to major events, including heavy snowfall and prolonged cold periods that can impede emergency response, isolate communities, and strain utilities and critical services.
Iron County	Highly Likely regionally; local occurrence varies with elevation.	Snowstorms, snow squalls, freezing temperatures, occasional ice	Iron County is expected to continue experiencing winter storm events. Both valley and higher-elevation areas face risks from heavy snowfall and rapid snow squalls, resulting in dangerous driving conditions, infrastructure disruptions, and episodic power outages during more intense storms.
Kane County	Highly Likely regionally; local occurrence varies with elevation.	Snowfall at higher elevations, freezing rain, icy road conditions	Kane County's winter conditions vary by elevation, with higher elevations experiencing more frequent snowstorms and lower elevations susceptible to freezing rain and icy conditions. Future events are expected to range from minor to moderate impacts, with localized major impacts in mountainous areas affecting highways and access routes.
Washington County	Highly Likely regionally; local occurrence varies with elevation.	Occasional snow, freezing temperatures at higher elevations, winter weather events	Washington County experiences less frequent snow accumulation in lower-elevation communities because winter temperatures are generally warmer there. However, future winter storms remain possible, particularly in higher-elevation areas, and may produce moderate impacts such as snow-covered roadways, travel delays, and limited power disruptions during stronger events.

Vulnerability Assessment

Winter storms create widespread vulnerability across the Five County AOG Region by affecting people, buildings, infrastructure, transportation networks, utilities, and critical services, with risk varying according to elevation, exposure, and community characteristics. Higher-elevation communities and mountainous transportation corridors are generally the most susceptible to heavy snowfall, blowing snow, prolonged cold, and road closures, while lower-elevation areas may still experience disruptive freezing conditions, icy roadways, and episodic snow events. Vulnerability is particularly shaped by dependence on major highway corridors, the presence of rural and isolated communities, aging or exposed utility infrastructure, and populations that may be more sensitive to cold and service disruptions, including older adults, medically vulnerable individuals, and travelers. The following assessment evaluates these vulnerabilities by considering the extent to which winter storms can damage property, disrupt essential services, isolate communities, and threaten public safety throughout southwestern Utah.

BEAVER COUNTY

Beaver County's high-elevation terrain, dispersed rural settlement pattern, and dependence on a limited number of transportation and utility corridors create significant winter storm vulnerability. Heavy snow, blowing snow, black ice, and prolonged cold can affect Interstate 15, State Route 21, local roads, and mountain passes, disrupting resident travel, freight movement, emergency response, school operations, and access to medical care. Rural residents, older adults, medically vulnerable people, and travelers are especially at risk when closures or outages delay assistance or isolate communities.

Exposed assets include Beaver Valley Hospital, schools, fire and EMS facilities, law enforcement functions, water and wastewater systems, electric distribution lines, communications systems, and residential structures susceptible to snow loading, frozen pipes, falling limbs, heating interruptions, and prolonged cold.

The most consequential effects are expected along transportation lifelines and where critical services have limited redundancy. Road crashes and closures can delay medical access and supply deliveries, while power or communications outages can affect homes, businesses, schools, public safety operations, utility systems, and Beaver Valley Hospital. Economic consequences may include business interruption, delayed freight, reduced workforce mobility, livestock and agricultural operational challenges, and increased snow removal and emergency-response costs.

Cascading impacts: Transportation disruption can delay emergency response, isolate residents, interrupt fuel and food deliveries, and restrict access to health care, schools, and workplaces. Power loss may then impair heating, communications, water and wastewater operations, and fuel availability; communications failures can further complicate coordination among road crews, utilities, and public safety agencies. In a rural county with limited alternate routes and service redundancy, these linked failures can extend outages, increase public-health risks, and slow recovery.

Changes in development: New residential, commercial, recreation, and infrastructure development can increase the number and value of assets exposed to snow, ice, and cold, particularly where growth extends along Interstate 15, State Route 21, or into higher-elevation and rural areas. Development outside established service areas may lengthen emergency-response and utility-restoration times and increase road-maintenance demands. Applying current building standards, protecting backup power and communications, maintaining reliable access, and considering snow storage, drainage, and road treatment needs as development occurs can limit growth in vulnerability.

GARFIELD COUNTY

Garfield County is vulnerable because extensive high-elevation terrain, widely separated communities, and limited transportation redundancy expose residents and visitors to heavy snow, drifting, ice, extreme cold, and prolonged snow cover. Risk is pronounced on Boulder Mountain, the Aquarius Plateau, U.S. Highway 89, State Route 12, State Route 22, and remote local roads. Closures can isolate communities and disrupt emergency response, school transportation, freight, tourism, and access to medical care.

Key exposed assets include Garfield Memorial Hospital in Panguitch, a 15-bed critical access hospital, along with schools, public safety facilities, water and wastewater systems, electric and communications infrastructure, homes, businesses, and tourism services. Countywide totals provide planning context and are not estimates of direct exposure to a single storm.

Winter storms may cause crashes and closures, delay emergency and utility crews, interrupt deliveries, and damage buildings through snow loading, frozen pipes, falling limbs, and heating-system disruption. Outages can constrain operations at the hospital, schools, public safety facilities, utility systems, and businesses. Because essential services are concentrated in a small number of communities and travel distances are long, even a moderate event can produce disproportionate impacts and extended restoration times.

Cascading impacts: Closure of U.S. Highway 89, State Route 12, State Route 22, or mountain connections can isolate residents, strand visitors, delay medical access, and interrupt fuel, food, and other deliveries. Power loss may impair heating, communications, water and wastewater operations, while inaccessible roads can prevent repair crews from reaching failures. These interactions can extend tourism and business interruption, increase risks to older and medically vulnerable residents, and complicate coordinated response across a large rural county.

Changes in development: New housing, visitor accommodations, recreation facilities, and supporting infrastructure can increase exposure, especially in high-elevation or remote locations and along corridors with few alternate routes. Seasonal and tourism-related development may also increase the number of unfamiliar travelers present during storms and place added demand on road maintenance and emergency services. Directing growth toward areas with reliable year-round access and utilities, while applying snow-load standards, backup-power provisions, and winter access and maintenance requirements, can reduce added vulnerability.

IRON COUNTY

Iron County combines growing population centers with high-elevation communities and travel routes regularly exposed to snowfall, snow squalls, black ice, and prolonged cold. Vulnerability is concentrated in and around Cedar City, along Interstate 15 and State Route 14, and on mountain roads serving Brian Head and nearby areas. Winter conditions can rapidly reduce visibility and disrupt travel, emergency response, education, commerce, tourism, and regional access to services.

Exposed assets include Cedar City Hospital, schools and higher-education facilities, public safety facilities, water and wastewater systems, utilities, communications infrastructure, homes, businesses, and regional government services. These countywide values provide planning context rather than direct exposure estimates for a single storm.

Snow and ice can cause major crashes, closures, delayed emergency response, and interruptions to school, university, hospital, business, freight, and visitor operations. Physical damage may include roof stress, frozen or burst pipes, falling limbs, and utility failures. Because Cedar City functions as a regional center for health care, education, government, and commerce, disruption can affect residents, students, workers, travelers, and surrounding communities that depend on county services.

Cascading impacts: Closures on Interstate 15, State Route 14, or mountain routes can interrupt freight, restrict access to Cedar City Hospital and other services, isolate higher-elevation areas, and delay utility restoration. Power loss may affect heating, communications, water and wastewater operations, fuel access, and institutional continuity; communications failures can impede coordination among public safety agencies, transportation officials, utilities, and major institutions. These linked effects can broaden a short winter event into regional public-health, education, economic, and continuity-of-operations impacts.

Changes in development: Continued growth in and around Cedar City and development in higher-elevation recreation and residential areas can increase the number of people, structures, and trips exposed to winter weather. Expansion along Interstate 15 and mountain corridors may add traffic to routes already susceptible to sudden squalls, ice, and closures, while dispersed growth can increase snow-removal, emergency-response, and utility-restoration demands. Current building standards, protected utilities, backup power, redundant communications, and development review that addresses winter access, slope, drainage, and snow storage can help prevent vulnerability from increasing with growth.

KANE COUNTY

Kane County's sharp elevation differences, dispersed communities, limited highway network, and year-round visitor travel create varied winter storm vulnerability. Higher-elevation areas and U.S. Highway 89, State Route 9, and mountain and canyon routes serving Orderville, Glendale, Mount Carmel Junction, Alton, and Zion National Park access points are exposed to snow, drifting, black ice, and reduced visibility. Kanab and other lower-elevation areas experience less sustained snowfall but remain susceptible to freezing rain, icy roads, brief snow events, and cold-related service disruption.

Exposed assets include Kane County Hospital in Kanab, schools, public safety facilities, water and wastewater systems, electric and communications infrastructure, homes, businesses, and tourism-dependent services. These countywide values provide planning context rather than direct exposure estimates for a single winter storm.

Winter storms can cause crashes, road closures, delayed emergency response, school disruption, utility outages, and interruption of freight and visitor travel. Buildings may experience frozen or burst pipes, localized roof stress, falling limbs, and heating-system problems. Limited alternate routes and the concentration of critical services in a few communities mean that short-duration road or utility disruptions can affect residents, workers, visitors, and access to health care and supplies across a large area.

Cascading impacts: Closures on U.S. Highway 89, State Route 9, or mountain and canyon routes can isolate communities, strand travelers, delay emergency medical access, and interrupt deliveries and tourism activity. Power loss may impair heating, communications, water and wastewater operations, fuel availability, and business continuity; poor communications can then hinder coordination among transportation, utility, public safety, and visitor-service organizations. These linked effects can prolong disruption and disproportionately affect older adults, medically vulnerable residents, and isolated households.

Changes in development: Additional housing, lodging, commercial, and recreation development can increase exposure along visitor routes and in elevated or remote areas where winter access is less reliable. Growth may increase unfamiliar winter drivers, traffic volumes, evacuation and response needs, and demand for road treatment, utilities, and emergency services. Locating growth where dependable access and utilities are available, preserving alternate access where feasible, and applying snow-load, freeze-protection, backup-power, and winter-maintenance requirements can reduce development-related increases in risk.

WASHINGTON COUNTY

Washington County combines rapidly growing lower-elevation communities with higher-elevation mountains and travel corridors exposed to snowfall, black ice, and freezing temperatures. St. George, Washington, and Hurricane receive less frequent snow accumulation than higher parts of the region, but even minor events can cause disproportionate disruption where road users and infrastructure are less accustomed to winter conditions. Vulnerability is greater in the Pine Valley Mountains, northeastern highlands, and along Interstate 15, State Route 9, State Route 18, and connecting roads.

Exposed assets include St. George Regional Hospital, schools, public safety and government facilities, water and wastewater systems, utilities, communications infrastructure, homes, businesses, and major regional service centers. These countywide values provide context and are not estimates of direct exposure to one winter storm.

Icy roads, snowfall, and rapid temperature changes can cause crashes, travel delays, freight and commuter disruption, delayed emergency response, and interruption of school, medical, government, and visitor services. Physical damage is generally localized but may include frozen pipes, falling limbs, power

interruptions, and snow-load concerns in higher elevations. Because the county is the region's largest population and economic center, even a short event can affect many residents, workers, visitors, businesses, and surrounding communities that depend on services in the St. George area.

Cascading impacts: Disruption on Interstate 15, State Route 9, State Route 18, or routes to higher terrain can delay emergency response, interrupt commuting and freight, and restrict access to health care and public services. Power outages may affect heating, communications, water and wastewater operations, fuel supply, and business continuity; communications failures can complicate coordination among utilities, transportation agencies, first responders, and major institutions. The county's large service population can amplify these linked effects and extend impacts beyond the immediate storm area.

Changes in development: Rapid residential and commercial growth increases the number and value of assets that may be affected by icy roads, cold, and localized snowfall, while expansion toward higher terrain or along major corridors can add traffic and service demands in exposed locations. A larger and older population may also increase medical, sheltering, and continuity needs during outages. Integrating winter access, road treatment, drainage and freeze protection, protected utilities, backup power, and emergency-service capacity into development and capital planning can help keep exposure from growing faster than community resilience.

5 Capability Assessment

Purpose and Scope

Local capabilities influence whether a jurisdiction can develop, fund, implement, and maintain actions that reduce long-term natural hazard risk. This assessment identifies the authorities, policies, programs, personnel, technical resources, funding mechanisms, outreach methods, and floodplain management functions available to each participating jurisdiction. The findings were used with the risk assessment and identified community needs to screen action feasibility, assign implementation responsibility, identify potential resources, and identify opportunities to improve or expand capability.

This regional summary presents common and county-level findings. It does not replace the participant-specific capability assessments provided in the jurisdiction sections of this plan. Those assessments document the capabilities and improvement opportunities of each participating county, municipality, Tribe, and special district, as applicable. Where a capability could not be confirmed, the plan does not assume that it exists; the relevant participant section identifies the item as a capability improvement opportunity or addresses it through an applicable mitigation action.

Assessment Method

The Five County AOG and the planning team evaluated capabilities in five categories: planning and regulatory; administrative and technical; financial; education and outreach; and National Flood Insurance Program (NFIP) and floodplain management. The assessment considered information supplied by participating jurisdictions during the planning process, current plans and ordinances made available for review, planning meeting discussions, and publicly available federal, state, and local sources. Findings were reviewed for applicability to mitigation implementation and were carried forward into participant-specific action development and prioritization. Each participant is responsible for confirming its information before plan adoption and for updating capability information during plan maintenance when staffing, authorities, programs, plans, or funding conditions change.

Capability Categories

- **Planning and Regulatory Capabilities:** Plans, policies, codes, ordinances, and development-management tools that can reduce risk to existing and future development.
- **Administrative and Technical Capabilities:** Staff, expertise, data, mutual-aid arrangements, systems, and technical tools available to develop, implement, and maintain mitigation actions.
- **Financial Capabilities:** Local funding mechanisms and access to state, federal, nonprofit, and other resources that may support feasible mitigation projects and required nonfederal cost share.
- **Education and Outreach Capabilities:** Programs, partnerships, and communication methods used to improve risk awareness, reach the whole community, encourage risk-reduction behavior, and support implementation.
- **NFIP and Floodplain Management Capabilities:** NFIP participation, floodplain administration, permitting and enforcement, substantial damage and substantial improvement procedures, flood-risk communication, and related staffing and technical resources.

Regional Findings and Use in the Mitigation Strategy

Documented capabilities across the planning area include land use planning, zoning, subdivision regulation, building code administration, wildfire planning, resource management planning, emergency management coordination, geographic information systems (GIS), hazard information, public communication, and access to local, state, federal, nonprofit, and private funding resources. The availability, staffing, currency, and formal use of these capabilities vary among participants. Recurring improvement needs include maintaining current plans and ordinances; documenting floodplain administration and substantial damage procedures; strengthening staff training and grant-development capacity; using updated hazard and future-conditions information in development review, capital programming, infrastructure design, and other planning mechanisms; and expanding accessible outreach to populations and locations with elevated risk.

The mitigation strategy uses these findings to determine whether proposed actions are technically, administratively, legally, and financially feasible; identify the office or partner responsible for implementation; identify potential funding and technical assistance; and develop actions that maintain or improve capability. During annual monitoring and the next plan update, each participant will review changes in plans, regulations, staffing, funding, data, partnerships, and NFIP administration and will document progress on actions intended to address capability gaps.

Five County Summary Findings

- **Beaver County:** Documented county capabilities include general planning, land use and zoning authority, subdivision regulation, building code administration, floodplain regulations, regional wildfire planning, GIS and hazard information, emergency management, public communication channels, volunteer and partner coordination, and access to multiple funding sources. Priority improvement opportunities are to document staffing and training needs, confirm available development-finance tools, maintain current NFIP and substantial damage procedures, and strengthen targeted outreach for flood, wildfire, and other locally significant risks.
- **Garfield County:** Documented county capabilities include general planning, land use authority, zoning and subdivision regulation, floodplain regulation, wildfire and resource management planning, a planning commission, emergency management, GIS and hazard information, mutual aid, public communication, and access to federal, state, nonprofit, and local resources. Priority improvement opportunities are to update or confirm capital, stormwater, emergency operations, and related planning mechanisms; clarify implementation and funding responsibilities; document floodplain administration procedures; and use hazard information more consistently in plan updates and development review.
- **Iron County:** Documented county capabilities include land use and transportation planning, zoning and subdivision authority, building code administration, floodplain regulation, emergency management, planning and engineering support, GIS and hazard information, grant-development experience, public alerting and communication tools, and potential local match mechanisms. Priority improvement opportunities are to document floodplain staffing and substantial damage procedures, confirm mutual-aid and GIS responsibilities, and demonstrate how updated hazard information is used in capital programming, development review, outreach, and grant applications.
- **Kane County:** Documented county capabilities include general and resource management planning, land use authority, zoning and subdivision regulation, wildfire planning, selected natural-hazard development provisions, planning and engineering support, emergency management, GIS and hazard information, mutual aid, and access to multiple funding sources. Priority improvement opportunities are to strengthen volunteer and nonprofit coordination, document floodplain permitting and enforcement procedures, improve public information on flood insurance and substantial damage requirements, and use available hazard information to inform development decisions in higher-risk areas.
- **Washington County:** Documented county capabilities include general and capital planning, land use and zoning authority, transportation and wildfire planning, critical lands and habitat planning, housing

planning, building code administration, natural-hazard development provisions, emergency management, engineering, GIS and hazard information, mutual aid, rapid assessment tools, public communication, and multiple funding mechanisms. Priority improvement opportunities are to maintain complete NFIP compliance documentation, strengthen flood-risk and insurance outreach, use capital programming to advance risk-reduction projects, expand accessible outreach to populations with elevated vulnerability, and continue integrating current hazard information into development review and infrastructure planning.

National Flood Insurance Program

NFIP participation allows property owners, renters, and businesses in participating communities to purchase federal flood insurance. Participating communities must adopt and enforce floodplain management regulations that meet or exceed NFIP minimum requirements. Community status may affect the availability of certain forms of federal disaster assistance. The FEMA Community Status Book identifies whether a community participates, does not participate, or is suspended or sanctioned. Table 47 reports participating communities in the five-county planning area as of April 8, 2026. The planning team will recheck community status before submittal and document any change in the participant-specific capability assessment and mitigation strategy, as applicable.

The Community Rating System (CRS) is a voluntary NFIP program that recognizes floodplain management activities exceeding minimum NFIP requirements. Eligible insurance premiums in participating communities receive discounts based on the community class. NFIP participation alone does not establish CRS participation. Participant-specific capability assessments identify verified CRS participation and class, where applicable, using FEMA's CRS eligible-community list effective April 1, 2026.

Table 47: NFIP-Participating Communities in the Five-County Planning Area, as of April 8, 2026

County	NFIP-Participating Communities
Beaver County	Beaver County; Milford
Garfield County	Garfield County; Escalante; Hatch; Henrieville; Panguitch; Tropic
Iron County	Iron County; Cedar City; Enoch; Kanarraville; Paragonah; Parowan
Kane County	Kane County; Alton; Glendale; Kanab; Orderville
Washington County	Washington County; Apple Valley; Enterprise; Hildale; Hurricane; Ivins; La Verkin; Leeds; New Harmony; Rockville; St. George; Santa Clara; Springdale; Toquerville; Virgin; Washington City

Source: FEMA, Community Status Book, Utah report, updated April 8, 2026. Community names are presented in plan style; FEMA status records remain the controlling source.

Capability Improvement and Plan Integration

Participants will use the capability findings when implementing and maintaining the plan. Applicable actions identify the responsible agency, anticipated timeframe, potential resources, and the capability or risk-reduction need addressed. Participants will also use updated hazard, land use, demographic, infrastructure, environmental, and future-conditions information when revising comprehensive plans, development regulations, capital improvement programs, emergency operations plans, community wildfire protection plans, floodplain management procedures, and other relevant mechanisms. This approach allows each jurisdiction to adjust its policies, projects, and outreach as conditions and available resources change without overstating the certainty of future local impacts.

6 Mitigation Strategy

6.1 Goals and Objectives

The following goals and objectives establish the Five County Area's long-term framework for reducing natural hazard risk. During the current plan update, the planning team and participating jurisdictions reviewed the goals at the August 25, 2026, mitigation strategy meeting after the risk and capability assessment activities. Participants considered updated hazard and vulnerability information, changes in development and other future conditions, local capabilities, public and stakeholder input, implementation experience, and lessons from the previous plan. The review retained the six-goal framework and clarified the goals and objectives to strengthen their mitigation focus and regional applicability.

Participating jurisdictions use these goals to develop and evaluate actions that address their identified hazards and vulnerabilities, account for changing conditions, and are feasible within their authorities and capabilities. Each action identifies the goal or goals it advances. The action evaluation and prioritization process considers the relationship among risk, capabilities, benefits, costs, technical feasibility, implementation responsibility, available resources, and other locally applicable criteria. Detailed performance measures, schedules, and monitoring responsibilities are provided in the mitigation action plan and plan maintenance procedures rather than embedded in the regional goals.

Goal 1: Protect Life and Property

Goal statement: Reduce long-term risk to people and public, private, residential, agricultural, and commercial property through appropriate structural and nonstructural mitigation measures.

Objective: Reduce the potential for injury, loss of life, property damage, and disruption by directing mitigation resources toward documented hazards and vulnerable people, structures, and locations.

Goal 2: Protect Critical Facilities, Infrastructure, and Community Lifelines

Goal statement: Reduce risk to critical facilities, infrastructure systems, and community lifelines and improve their ability to continue or rapidly restore essential functions following natural hazard events.

Objective: Promote mitigation, redundancy, protective design, maintenance, and other risk-reduction measures that limit damage and service interruptions affecting essential community functions.

Goal 3: Strengthen Public Education and Risk Communication

Goal statement: Improve residents' and visitors' understanding of natural hazards, protective measures, insurance and other risk-transfer options where applicable, and actions they can take to reduce risk.

Objective: Provide accessible, hazard-specific information and outreach that supports informed risk-reduction decisions and addresses the needs of people and locations that may experience disproportionate hazard impacts.

Goal 4: Strengthen Partnerships and Coordination

Goal statement: Coordinate mitigation planning and implementation among participating jurisdictions; local, state, Tribal, and federal agencies; nonprofit and community organizations; businesses; infrastructure owners and operators; academia; and other relevant partners.

Objective: Maintain partnerships that improve information sharing, align authorities and resources, support cross-jurisdictional projects, and address hazards and landscapes that cross jurisdictional boundaries, including coordination with federal land-management partners where applicable.

Goal 5: Strengthen the Resilience of Emergency Services

Goal statement: Reduce pre-disaster risk to emergency services, personnel, facilities, equipment, communications, access routes, and supporting systems needed to protect the public during and after natural hazard events.

Objective: Improve the continuity, redundancy, reliability, and hazard resistance of emergency-service capabilities through sustained mitigation actions undertaken before disasters occur.

Goal 6: Protect and Use Natural Systems

Goal statement: Protect, restore, and manage natural systems and landscapes where those measures can reduce natural hazard risk and provide compatible environmental and community benefits.

Objective: Advance feasible nature-based and watershed-, forest-, rangeland-, and landscape-scale mitigation measures that reduce long-term risk to communities, infrastructure, property, and economic resources while maintaining or improving natural functions.

Application of the Goals

The goals apply regionwide, while each participating jurisdiction selects and prioritizes actions based on its own hazards, vulnerabilities, development patterns, future conditions, assets, capabilities, and priorities. The mitigation action tables provide the formal record of how individual actions support one or more goals. During annual plan monitoring, jurisdictions will review action progress and consider whether changes in hazards, development, population, infrastructure, environmental conditions, capabilities, or available resources warrant adjustments to actions or implementation priorities. The goals will be reconsidered during the next plan update and revised when changes in risk, policy, or regional priorities warrant modification.

6.2 Mitigation Action Development and Evaluation

Following confirmation of the regional goals and objectives, the planning team and each plan participant developed and reviewed mitigation actions that address the hazards, vulnerabilities, and impacts identified in the risk assessment. The process was designed to produce an achievable, risk-informed strategy for reducing current and future losses to people, existing and future buildings, infrastructure, community lifelines, natural and cultural resources, and other assets valued by the Five County Region.

Comprehensive Range of Actions Considered

Each plan participant considered a comprehensive range of mitigation approaches, including local plans and regulations; structure and infrastructure projects; natural systems protection; and education and awareness programs. Participants also considered actions that could improve hazard data, strengthen local capabilities, support the National Flood Insurance Program, and address implementation barriers. Proposed actions were evaluated for their relationship to documented vulnerabilities and impacts, their applicability to existing and future development, and their feasibility within each participant's legal, administrative, technical, and financial capabilities.

Table 48 documents the range of mitigation actions considered by each plan participant, including actions selected for implementation and alternatives not selected at this time. Retaining the full record of considered actions supports future reconsideration as risks, capabilities, priorities, and funding opportunities change.

Table 48: Mitigation Actions and Alternatives Considered

Plan Participant	Hazard(s)	Vulnerability or Impact Addressed	Action or Alternative Considered	Action Type	Disposition	Rationale
All participating jurisdictions	Multiple Hazards	Existing and future development; public safety; critical facilities and community lifelines	Use the regional catalog and county annex selection matrices to identify jurisdiction-specific actions linked to profiled hazards and vulnerabilities.	Capability/Data Improvement	Selected	Provides one complete action record while preserving jurisdiction-specific selection and accountability.
Applicable jurisdictions in dam-inundation areas	Dam Failure	People, roads, utilities, and critical facilities in inundation areas	Update evacuation plans and routes; establish dam owner/operator communication protocols; assess exposed critical infrastructure.	Plans and Regulations	Selected	Directly responds to dam-failure exposure and can be tailored to the applicable dam and local inundation area.
Applicable counties and municipalities	Flooding	Undersized drainage, erosion, damaged crossings, and development in flood-prone areas	Prepare drainage studies; maintain channels and culverts; construct prioritized detention, conveyance, bridge, culvert, and bank-stabilization projects.	Structure and Infrastructure Project	Selected	Addresses recurring local infrastructure and erosion concerns identified in jurisdiction files.
Applicable counties and municipalities	Wildfire	Wildland-urban interface development, hazardous fuels,	Adopt WUI[128] standards; implement fuels reduction; update CWPP[129] and evacuation	Natural Systems Protection	Selected	Combines regulatory, project, natural-system, and outreach approaches

[128] WUI = wildland-urban interface
[129] CWPP = Community Wildfire Protection Plan

Plan Participant	Hazard(s)	Vulnerability or Impact Addressed	Action or Alternative Considered	Action Type	Disposition	Rationale
		evacuation constraints, and post-fire erosion	priorities; restore burned slopes.			documented in local action inventories.
Applicable water systems and jurisdictions	Drought	Water-supply shortage, limited redundancy, high demand, and agricultural losses	Prepare drought plans; diversify supply and storage; reduce system losses and outdoor demand; promote agricultural conservation and crop insurance.	Plans and Regulations	Selected	Provides infrastructure, conservation, and economic-risk options appropriate to different local capabilities.
Applicable jurisdictions	Earthquake	Older buildings, unreinforced masonry, nonstructural hazards, and vulnerable utilities	Inventory and retrofit vulnerable facilities; enforce seismic codes; use flexible utility connections; conduct outreach.	Structure and Infrastructure Project	Selected	Supports both existing-building risk reduction and safer future development.
Applicable jurisdictions	Extreme Heat; Winter Storms; Damaging Winds; Hail; Thunderstorms and Lightning; Tornadoes	Exposure of people, buildings, utility systems, transportation, and outdoor facilities	Harden facilities and utilities; improve cooling and shelter options; protect roofs and equipment; maintain public-warning and outreach programs.	Structure and Infrastructure Project	Selected	Maintains at least one implementable option for each weather hazard in the regional risk assessment.
Applicable jurisdictions	Landslide; Problem Soils	Unstable slopes, rockfall, debris flow, and unsuitable soils affecting development and infrastructure	Improve mapping and monitoring; require geotechnical review and setbacks; stabilize priority slopes and damaged infrastructure.	Plans and Regulations	Selected	Links development review with site-specific corrective projects.

Plan Participant	Hazard(s)	Vulnerability or Impact Addressed	Action or Alternative Considered	Action Type	Disposition	Rationale
Applicable jurisdictions	Radon Gas	Indoor exposure in homes, schools, workplaces, and public facilities	Provide testing and mitigation outreach; test public facilities; consider radon-resistant new construction.	Education and Awareness	Selected	Provides near-term outreach and longer-term building-risk reduction options.
All participating jurisdictions	Multiple Hazards	Loss of power, communications, access, and continuity of essential services	Integrate hazard priorities into capital planning; add backup power and redundant communications; update continuity and mutual-aid arrangements.	Capability/Data Improvement	Selected	Improves implementation capacity and continuity across hazards.
Jurisdictions with repeatedly damaged or high-risk property	Flooding; Wildfire; Landslide; Multiple Hazards	Structures or land exposed to severe repetitive or long-term risk	Acquire, relocate, or remove at-risk structures or preserve high-risk land as permanent open space when voluntary and feasible.	Structure and Infrastructure Project	Deferred	Retained as an option where willing owners, eligibility, benefit-cost effectiveness, and funding can be demonstrated.
Applicable jurisdictions	Multiple Hazards	Unfunded capital and staffing needs	Rely only on emergency response, warning, or equipment purchases without a sustained risk-reduction component.	Capability/Data Improvement	Not Selected	Preparedness measures may support implementation but do not substitute for mitigation that reduces long-term risk.

Note: Action types are Plans and Regulations; Structure and Infrastructure Project; Natural Systems Protection; Education and Awareness; and Capability/Data Improvement. Dispositions are Selected, Deferred, Combined with Another Action, and Not Selected. The rationale column explains why actions were selected, deferred, or not selected.

Linkage to the Risk Assessment and Future Conditions

Each selected action is linked to one or more hazards and to a vulnerability or impact documented in the risk assessment. Plan participants considered how changes in development, population, land use, infrastructure condition, and other future conditions may affect long-term risk. Where the risk assessment indicates that future conditions may increase or shift risk, participants considered actions that avoid creating new risk, reduce exposure in existing developed areas, strengthen community lifelines, improve adaptive capacity, or preserve future implementation options. Jurisdiction-specific action tables identify the hazards addressed and should be read with the applicable vulnerability and impact assessments.

Mitigation Action Plan

The mitigation action plan identifies the actions that plan participants intend to pursue during the 2027–2032 plan cycle. Each participant identified at least one action for every hazard addressed in its jurisdiction-specific risk assessment. Regional or multi-jurisdictional actions may be shared when responsibilities and participating jurisdictions are clearly identified. Actions that do not provide a sustained reduction in long-term natural hazard risk may be retained for coordination purposes, but they do not substitute for required mitigation actions.

Action Prioritization Method

Plan participants prioritized actions using a structured review of social, technical, administrative, political, legal, economic, and environmental considerations. The review also gave specific emphasis to whether the anticipated monetary and nonmonetary benefits of an action are reasonable in relation to its estimated cost. A formal benefit-cost analysis was not required at the planning stage. Instead, participants used available information and professional judgment to compare alternatives and identify actions that maximize life-safety, property-protection, service-continuity, environmental, economic, and social benefits relative to cost and implementation constraints.

Participants assigned an overall priority of High, Moderate, or Low. High-priority actions generally address a documented high-consequence vulnerability, protect life or critical services, produce substantial benefits relative to cost, and can be advanced with available or reasonably anticipated authority, staffing, partnerships, and funding. Moderate-priority actions provide meaningful risk-reduction benefits but may depend on additional study, coordination, capacity, or funding. Low-priority actions remain useful but have lower urgency, fewer anticipated benefits, greater implementation barriers, or a longer

implementation horizon. A lower rating does not mean that an action should not be implemented if conditions or funding opportunities change.

Table 49: Mitigation Action Prioritization Criteria

Criterion	Key Considerations	Rating or Finding
Social	Life safety; effects on vulnerable populations; public support; equitable access to benefits; displacement or disruption.	Document affected populations and anticipated life-safety and community benefits; identify adverse effects and mitigation measures.
Technical	Proven method; engineering feasibility; site conditions; useful life; effectiveness for the identified hazard and vulnerability.	Confirm the action is technically feasible and likely to provide sustained risk reduction; identify needed study or design.
Administrative	Lead department; staffing; procurement; grant management; maintenance responsibility; partner capacity.	Identify a lead entity and realistic partners; rate lower or phase the action when capacity is not yet available.
Political	Consistency with adopted priorities; governing-body and community support; interjurisdictional coordination.	Document support or coordination needs and whether approvals can reasonably be obtained during the plan cycle.
Legal	Authority; property rights; permitting; code adoption; environmental and historic-preservation compliance.	Confirm legal authority or identify the approvals, easements, permits, or policy changes needed before implementation.
Economic / Cost-Benefit	Planning-level cost; funding eligibility; avoided losses; life-safety and service-continuity benefits; operations and maintenance.	Assign High, Moderate, or Low priority based in part on whether monetary and nonmonetary benefits reasonably justify estimated cost.
Environmental	Effects on water, habitat, soils, air quality, cultural resources, and natural floodplain or watershed functions.	Prefer actions with environmental co-benefits; identify review, avoidance, minimization, and mitigation needs for adverse effects.

The Economic / Cost-Benefit criterion evaluates anticipated benefits in relation to the estimated cost or cost category and whether benefits are expected to exceed or reasonably justify costs. It considers monetary and nonmonetary benefits, including avoided injuries and losses, continuity of essential services, reduced recovery time and costs, protection of natural and cultural resources, and improved quality of life.

Implementation and Administration

The jurisdiction-specific action plan tables identify the position, office, department, or agency responsible for administering each action; potential partners; applicable and sufficiently specific funding sources; the expected completion timeframe; estimated cost; and priority. Where more than one entity is listed, the lead entity is designated. Short-term means implementation anticipated within 1–2 years; medium-term means 3–5 years; and long-term means more than 5 years. Ongoing is used only for continuing, recurring, or phased activities and should include an implementation frequency or milestone where practicable.

Estimated costs are planning-level categories rather than project budgets: Low indicates limited staff time, outreach, routine administration, or minor improvements; Moderate indicates studies, equipment, targeted retrofits, or limited construction; and High indicates major capital improvements, extensive retrofits, or substantial construction. Combined categories reflect variation in scope or phasing; Low incremental indicates a limited additional cost when incorporated into planned work. Dollar estimates will be refined as project scopes are developed. Potential funding sources are subject to program availability and project eligibility; routine operations, maintenance, outreach, and response activities rely on local budgets unless a specific eligible funding opportunity is identified. HMGP refers to FEMA's Hazard Mitigation Grant Program; CIB refers to Utah's Permanent Community Impact Fund Board.

Implementation is subject to available authority, staff capacity, technical feasibility, competing priorities, and funding. The identification of a potential grant program does not guarantee eligibility or award. Responsible agencies will refine scopes, costs, schedules, environmental and historic preservation requirements, and benefit-cost documentation as actions advance toward funding and implementation. Progress will be monitored through the plan maintenance process described in the following section.

Table 50: 2027–2032 Regional Mitigation Action Plan

Action ID	Mitigation Action	Goal(s)	Jurisdiction(s)	Hazard(s)	Vulnerability / Impact Addressed	Responsible Position, Office, Department, or Agency	Potential Partners	Potential Funding Source(s)	Timeframe	Estimated Cost	Priority
FCA-DF-01	Update dam-failure warning, evacuation, and public-information procedures for inundation areas.	1, 3, 4, 5	Applicable participating jurisdictions, as selected in county annex matrix	Dam Failure	People, critical facilities, roads, and utilities in inundation areas.	Local emergency management	Five County AOG[130]; counties; municipalities; state/federal agencies; utilities or special districts, as applicable	Local department budget[131][132]	Short term; annual review	Low	High
FCA-DF-02	Formalize real-time communication protocols with dam owners, state partners, and upstream and downstream jurisdictions.	1, 4, 5	Applicable participating jurisdictions, as selected in county annex matrix	Dam Failure	Delayed notification and fragmented interagency coordination.	Local emergency management	Five County AOG; counties; municipalities; state/federal agencies; utilities or special districts, as applicable	Local department budget	Short term; annual exercise	Low	High
FCA-DF-03	Assess critical infrastructure and development exposure within	1, 2, 4	Applicable participating jurisdictions, as selected in	Dam Failure	Critical facilities and future development	Planning and emergency management	Five County AOG; counties; municipalities; state/federal	Local capital budget; FEMA HMGP for eligible	Medium term	Moderate	Moderate

[130] FCAOG = Five County Association of Governments
[131] FEMA = Federal Emergency Management Agency
[132] HMA = Hazard Mitigation Assistance

Action ID	Mitigation Action	Goal(s)	Jurisdiction(s)	Hazard(s)	Vulnerability / Impact Addressed	Responsible Position, Office, Department, or Agency	Potential Partners	Potential Funding Source(s)	Timeframe	Estimated Cost	Priority
	mapped dam-inundation areas.		county annex matrix		exposed to inundation.		agencies; utilities or special districts, as applicable	mitigation projects			
FCA-WI-01	Adopt or update Wildland-Urban Interface standards for defensible space, access, water supply, and ignition-resistant construction.	1, 2	Applicable participating jurisdictions, as selected in county annex matrix	Wildfire	Structures and new development in wildfire-prone areas.	Planning/building department	Five County AOG; counties; municipalities; state/federal agencies; utilities or special districts, as applicable	Local planning/building budget; development-review fees	Short term; ongoing enforcement	Low	High
FCA-WI-02	Inventory and reduce hazardous fuels around critical facilities, utilities, roads, and community boundaries.	1, 2, 6	Applicable participating jurisdictions, as selected in county annex matrix	Wildfire	Fuel accumulation threatens life, property, evacuation, and lifelines.	Fire department or public works	Five County AOG; counties; municipalities; state/federal agencies; utilities or special districts, as applicable	Local fire/public works budget; Utah FFSL Community Wildfire Defense Grants; FEMA HMGP for eligible fuels projects	Ongoing; annual milestone	Moderate to High	High
FCA-WI-03	Update wildfire protection, evacuation, post-fire revegetation, and burn-scar	1, 4, 5, 6	Applicable participating jurisdictions, as selected in county annex matrix	Wildfire	Evacuation constraints and post-fire erosion, debris flow, and flooding.	Emergency management/planning	Five County AOG; counties; municipalities; state/federal agencies; utilities or	Local budget; Utah FFSL Community Wildfire Defense Grants for eligible CWPP work; FFSL	Medium term; annual review	Moderate	High

Action ID	Mitigation Action	Goal(s)	Jurisdiction(s)	Hazard(s)	Vulnerability / Impact Addressed	Responsible Position, Office, Department, or Agency	Potential Partners	Potential Funding Source(s)	Timeframe	Estimated Cost	Priority
	stabilization priorities.						special districts, as applicable	Post-Fire Rehabilitation Grant for eligible restoration			
FCA-FL-01	Prepare or update stormwater and drainage master plans and inventory culverts, bridges, washes, and detention facilities.	1, 2	Applicable participating jurisdictions, as selected in county annex matrix	Flooding	Undersized or deteriorated drainage systems and data gaps.	Public works/engineering	Five County AOG; counties; municipalities; state/federal agencies; utilities or special districts, as applicable	Local capital budget; Utah CIB; FEMA HMGP for eligible mitigation projects	Short to medium term	Moderate	High
FCA-FL-02	Construct prioritized drainage, culvert, bridge, detention, channel, erosion-control, and bank-stabilization improvements.	1, 2, 6	Applicable participating jurisdictions, as selected in county annex matrix	Flooding	Flooding and erosion threaten structures, roads, utilities, and access.	Public works/engineering	Five County AOG; counties; municipalities; state/federal agencies; utilities or special districts, as applicable	Local capital budget; Utah CIB; FEMA HMGP for eligible mitigation projects	Medium to long term; phased	High	High
FCA-FL-03	Inspect and maintain drainage channels, culverts, detention facilities, and bridge openings.	1, 2	Applicable participating jurisdictions, as selected in county annex matrix	Flooding	Debris and sediment reduce capacity and increase overtopping.	Public works	Five County AOG; counties; municipalities; state/federal agencies; utilities or	Local public works operations and maintenance budget	Ongoing; semiannual or pre-storm	Low to Moderate	High

Action ID	Mitigation Action	Goal(s)	Jurisdiction(s)	Hazard(s)	Vulnerability / Impact Addressed	Responsible Position, Office, Department, or Agency	Potential Partners	Potential Funding Source(s)	Timeframe	Estimated Cost	Priority
							special districts, as applicable				
FCA-FL-04	Strengthen floodplain, erosion-hazard, riparian-setback, and stormwater standards for development.	1, 2, 6	Applicable participating jurisdictions, as selected in county annex matrix	Flooding	Development may increase exposure or runoff.	Planning/floodplain administration	Five County AOG; counties; municipalities; state/federal agencies; utilities or special districts, as applicable	Local planning budget; development-review fees; FEMA HMGP for eligible code activities	Short term; ongoing	Low	High
FCA-DR-01	Prepare or update a drought-response and water-shortage plan with staged triggers and conservation measures.	2, 3, 4	Applicable participating jurisdictions, as selected in county annex matrix	Drought	Water shortages and unclear response actions.	Water utility/emergency management	Five County AOG; counties; municipalities; state/federal agencies; utilities or special districts, as applicable	Local water utility and emergency-management budgets	Short term; annual review	Low to Moderate	High
FCA-DR-02	Develop or diversify water sources, storage, treatment, conveyance, and emergency interconnections.	2, 4	Applicable participating jurisdictions, as selected in county annex matrix	Drought	Limited redundancy, storage, or treatment capacity.	Water utility/public works	Five County AOG; counties; municipalities; state/federal agencies; utilities or special	Local capital budget; Utah CIB; FEMA HMGP for eligible mitigation projects	Medium to long term	High	High

Action ID	Mitigation Action	Goal(s)	Jurisdiction(s)	Hazard(s)	Vulnerability / Impact Addressed	Responsible Position, Office, Department, or Agency	Potential Partners	Potential Funding Source(s)	Timeframe	Estimated Cost	Priority
							districts, as applicable				
FCA-DR-03	Reduce water demand through leak detection, efficient fixtures, irrigation upgrades, turf replacement, and waterwise landscaping.	2, 3, 6	Applicable participating jurisdictions, as selected in county annex matrix	Drought	High demand and distribution losses.	Water utility/planning	Five County AOG; counties; municipalities; state/federal agencies; utilities or special districts, as applicable	Local water utility budget; utility conservation incentives, where available	Ongoing; annual milestone	Low to Moderate	High
FCA-EQ-01	Inventory and evaluate unreinforced masonry, older public buildings, schools, and critical facilities for retrofit.	1, 2	Applicable participating jurisdictions, as selected in county annex matrix	Earthquake	Collapse, falling hazards, and interruption of essential services.	Building/facilities department	Five County AOG; counties; municipalities; state/federal agencies; utilities or special districts, as applicable	Local capital budget; FEMA HMGP for eligible mitigation projects	Medium term	Moderate to High	High
FCA-EQ-02	Apply seismic codes, flexible utility connections, and equipment anchorage during construction and replacement.	1, 2	Applicable participating jurisdictions, as selected in county annex matrix	Earthquake	Damage to buildings and lifeline systems.	Building department/public works	Five County AOG; counties; municipalities; state/federal agencies; utilities or special districts, as applicable	Local capital budget; FEMA HMGP for eligible mitigation projects	Ongoing with capital projects	Low incremental to High	High

Action ID	Mitigation Action	Goal(s)	Jurisdiction(s)	Hazard(s)	Vulnerability / Impact Addressed	Responsible Position, Office, Department, or Agency	Potential Partners	Potential Funding Source(s)	Timeframe	Estimated Cost	Priority
FCA-EQ-03	Provide recurring earthquake-risk and nonstructural-mitigation outreach.	1, 3	Applicable participating jurisdictions, as selected in county annex matrix	Earthquake	Injury and loss from unsecured contents and limited preparedness.	Emergency management	Five County AOG; counties; municipalities; state/federal agencies; utilities or special districts, as applicable	Local department budget	Ongoing; annual campaign	Low	Moderate
FCA-LS-01	Map, monitor, and evaluate landslide, rockfall, and debris-flow areas affecting development and infrastructure.	1, 2	Applicable participating jurisdictions, as selected in county annex matrix	Landslide	Uncertain slope stability and exposed assets.	Planning/engineering	Five County AOG; counties; municipalities; state/federal agencies; utilities or special districts, as applicable	Local capital budget; FEMA HMGP for eligible mitigation projects	Medium term; periodic monitoring	Moderate	High
FCA-LS-02	Require geotechnical investigation, slope analysis, setbacks, and engineered mitigation near unstable slopes.	1, 2	Applicable participating jurisdictions, as selected in county annex matrix	Landslide	Future development on unstable slopes.	Planning/building department	Five County AOG; counties; municipalities; state/federal agencies; utilities or special districts, as applicable	Local planning/building budget; development-review fees	Short term; ongoing	Low incremental	High

Action ID	Mitigation Action	Goal(s)	Jurisdiction(s)	Hazard(s)	Vulnerability / Impact Addressed	Responsible Position, Office, Department, or Agency	Potential Partners	Potential Funding Source(s)	Timeframe	Estimated Cost	Priority
FCA-LS-03	Stabilize priority public slopes and burn scars using drainage, revegetation, erosion control, or engineered treatments.	1, 2, 6	Applicable participating jurisdictions, as selected in county annex matrix	Landslide	Slope failure, debris flow, erosion, and sediment impacts.	Public works/natural resources	Five County AOG; counties; municipalities; state/federal agencies; utilities or special districts, as applicable	Local capital budget; FEMA HMGP for eligible mitigation projects	Medium term; phased	Moderate to High	Moderate
FCA-PS-01	Require subsurface geotechnical investigation and foundation recommendations where problem soils may affect structures.	1, 2	Applicable participating jurisdictions, as selected in county annex matrix	Problem Soils	Expansive, collapsible, corrosive, or unsuitable soils.	Planning/building department	Five County AOG; counties; municipalities; state/federal agencies; utilities or special districts, as applicable	Local planning/building budget; development-review fees	Ongoing with development review	Low incremental	High
FCA-PS-02	Update problem-soil mapping and inventory locations where soil conditions have damaged assets.	1, 2	Applicable participating jurisdictions, as selected in county annex matrix	Problem Soils	Incomplete data and recurring damage.	Engineering/GIS[133]	Five County AOG; counties; municipalities; state/federal agencies; utilities or special districts, as applicable	Local engineering/GIS budget	Medium term	Low to Moderate	Moderate

[133] GIS = geographic information system

Action ID	Mitigation Action	Goal(s)	Jurisdiction(s)	Hazard(s)	Vulnerability / Impact Addressed	Responsible Position, Office, Department, or Agency	Potential Partners	Potential Funding Source(s)	Timeframe	Estimated Cost	Priority
FCA-PS-03	Implement site-specific roadway, drainage, foundation, or utility improvements in problem-soil locations.	1, 2	Applicable participating jurisdictions, as selected in county annex matrix	Problem Soils	Damage to infrastructure and property.	Public works/engineering	Five County AOG; counties; municipalities; state/federal agencies; utilities or special districts, as applicable	Local capital budget; Utah CIB; FEMA HMGP for eligible mitigation projects	Medium to long term; phased	Moderate to High	Moderate
FCA-RN-01	Provide recurring radon-risk, testing, and mitigation information through public and partner channels.	1, 3	Applicable participating jurisdictions, as selected in county annex matrix	Radon Gas	Indoor exposure and limited awareness.	Public health/outreach lead	Five County AOG; counties; municipalities; state/federal agencies; utilities or special districts, as applicable	Local public health/outreach budget	Ongoing; annual campaign	Low	Moderate
FCA-RN-02	Test public facilities for radon and mitigate where results exceed applicable action levels.	1, 2	Applicable participating jurisdictions, as selected in county annex matrix	Radon Gas	Potential exposure in public facilities.	Facilities department	Five County AOG; counties; municipalities; state/federal agencies; utilities or special districts, as applicable	Local facilities budget	Short term; retest per protocol	Low to Moderate	High

Action ID	Mitigation Action	Goal(s)	Jurisdiction(s)	Hazard(s)	Vulnerability / Impact Addressed	Responsible Position, Office, Department, or Agency	Potential Partners	Potential Funding Source(s)	Timeframe	Estimated Cost	Priority
FCA-RN-03	Consider radon-resistant new-construction standards or guidance.	1	Applicable participating jurisdictions, as selected in county annex matrix	Radon Gas	Future indoor exposure in new buildings.	Building department	Five County AOG; counties; municipalities; state/federal agencies; utilities or special districts, as applicable	Local planning/building budget; development-review fees	Short term; ongoing	Low incremental	Moderate
FCA-EH-01	Improve cooling options through cooling centers, shade, trees, hydration, and heat-resilient streetscapes.	1, 2, 6	Applicable participating jurisdictions, as selected in county annex matrix	Extreme Heat	Heat exposure among vulnerable populations, workers, and visitors.	Emergency management/facilities	Five County AOG; counties; municipalities; state/federal agencies; utilities or special districts, as applicable	Local facilities/public works budget; Utah CIB for eligible public-facility improvements	Short to medium term	Low to Moderate	High
FCA-EH-02	Develop a heat-response protocol using forecast triggers, facility hours, transportation options, and targeted notifications.	1, 3, 5	Applicable participating jurisdictions, as selected in county annex matrix	Extreme Heat	Limited warning and access to cooling resources.	Emergency management/public health	Five County AOG; counties; municipalities; state/federal agencies; utilities or special districts, as applicable	Local department budget	Short term; annual review	Low	High

Action ID	Mitigation Action	Goal(s)	Jurisdiction(s)	Hazard(s)	Vulnerability / Impact Addressed	Responsible Position, Office, Department, or Agency	Potential Partners	Potential Funding Source(s)	Timeframe	Estimated Cost	Priority
FCA-DW-01	Assess and retrofit vulnerable buildings, roofs, signs, rooftop equipment, communications, and utilities for wind loads.	1, 2	Applicable participating jurisdictions, as selected in county annex matrix	Damaging Winds	Wind damage and interruption of critical services.	Facilities/public works	Five County AOG; counties; municipalities; state/federal agencies; utilities or special districts, as applicable	Local capital budget; FEMA HMGP for eligible mitigation projects	Medium term; phased	Moderate to High	Moderate
FCA-DW-02	Improve wind warning, public guidance, and debris or vegetation management around infrastructure and routes.	1, 2, 3, 5	Applicable participating jurisdictions, as selected in county annex matrix	Damaging Winds	Falling trees, debris, outages, and limited warning.	Emergency management/public works	Five County AOG; counties; municipalities; state/federal agencies; utilities or special districts, as applicable	Local department budget	Ongoing; annual milestone	Low to Moderate	Moderate
FCA-HA-01	Evaluate hail exposure and use impact-resistant roofing, glazing, and equipment protection during replacement or construction.	1, 2	Applicable participating jurisdictions, as selected in county annex matrix	Hail	Roof, glazing, equipment, and vehicle damage.	Facilities/building department	Five County AOG; counties; municipalities; state/federal agencies; utilities or special districts, as applicable	Local capital budget; FEMA HMGP for eligible mitigation projects	Ongoing with replacement cycles	Moderate	Moderate

Action ID	Mitigation Action	Goal(s)	Jurisdiction(s)	Hazard(s)	Vulnerability / Impact Addressed	Responsible Position, Office, Department, or Agency	Potential Partners	Potential Funding Source(s)	Timeframe	Estimated Cost	Priority
FCA-HA-02	Provide hail preparedness and property-protection information to residents, businesses, agriculture, and facility managers.	1, 3	Applicable participating jurisdictions, as selected in county annex matrix	Hail	Limited awareness of protective measures.	Emergency management/outreach lead	Five County AOG; counties; municipalities; state/federal agencies; utilities or special districts, as applicable	Local department budget	Ongoing; annual campaign	Low	Low
FCA-TL-01	Install lightning and surge protection, grounding, backup power, and communications safeguards at critical facilities.	1, 2, 5	Applicable participating jurisdictions, as selected in county annex matrix	Thunderstorms and Lightning	Lightning damage, outages, and disruption of essential services.	Facilities/IT[134]/public works	Five County AOG; counties; municipalities; state/federal agencies; utilities or special districts, as applicable	Local capital budget; FEMA HMGP for eligible mitigation projects	Medium term; phased	Moderate	High
FCA-TL-02	Use alerts, signage, and operating procedures at parks, schools, pools, events, and exposed outdoor locations.	1, 3, 5	Applicable participating jurisdictions, as selected in county annex matrix	Thunderstorms and Lightning	Outdoor lightning exposure and limited warning.	Parks/emergency management	Five County AOG; counties; municipalities; state/federal agencies; utilities or special districts, as applicable	Local department budget	Short term; seasonal review	Low	Moderate

[134] IT = information technology

Action ID	Mitigation Action	Goal(s)	Jurisdiction(s)	Hazard(s)	Vulnerability / Impact Addressed	Responsible Position, Office, Department, or Agency	Potential Partners	Potential Funding Source(s)	Timeframe	Estimated Cost	Priority
FCA-TO-01	Maintain tornado and severe-thunderstorm alerts, shelter guidance, and protective-action messaging.	1, 3, 5	Applicable participating jurisdictions, as selected in county annex matrix	Tornadoes	Rapid-onset wind, debris, and limited shelter awareness.	Emergency management	Five County AOG; counties; municipalities; state/federal agencies; utilities or special districts, as applicable	Local department budget	Ongoing; annual campaign	Low	Moderate
FCA-TO-02	Evaluate safe-room or hardened-space options during construction or major renovation of community facilities.	1, 2, 5	Applicable participating jurisdictions, as selected in county annex matrix	Tornadoes	Lack of protected space in vulnerable facilities.	Facilities/building department	Five County AOG; counties; municipalities; state/federal agencies; utilities or special districts, as applicable	Local capital budget; FEMA HMGP for eligible mitigation projects	Long term; opportunity based	High	Low to Moderate
FCA-WS-01	Prioritize snow and ice control routes serving critical facilities, schools, and isolated communities.	1, 2, 5	Applicable participating jurisdictions, as selected in county annex matrix	Winter Storms	Road closures, isolation, and delayed response.	Public works/roads department	Five County AOG; counties; municipalities; state/federal agencies; utilities or special districts, as applicable	Local roads operations and maintenance budget	Ongoing; annual pre-season review	Moderate	High

Action ID	Mitigation Action	Goal(s)	Jurisdiction(s)	Hazard(s)	Vulnerability / Impact Addressed	Responsible Position, Office, Department, or Agency	Potential Partners	Potential Funding Source(s)	Timeframe	Estimated Cost	Priority
FCA-WS-02	Assess roofs, power, water, and critical facilities for snow, ice, and cold vulnerabilities and implement retrofits.	1, 2, 5	Applicable participating jurisdictions, as selected in county annex matrix	Winter Storms	Roof loading, frozen systems, outages, and interruption.	Facilities/public works	Five County AOG; counties; municipalities; state/federal agencies; utilities or special districts, as applicable	Local capital budget; FEMA HMGP for eligible mitigation projects	Medium term; phased	Moderate to High	Moderate
FCA-MH-01	Update emergency operations, continuity, evacuation, warning, and interoperable communications using current risk information.	1, 3, 4, 5	Applicable participating jurisdictions, as selected in county annex matrix	Multiple Hazards	Cross-hazard warning, evacuation, coordination, and continuity gaps.	Emergency management	Five County AOG; counties; municipalities; state/federal agencies; utilities or special districts, as applicable	Local department budget	Short term; annual review	Low to Moderate	High
FCA-MH-02	Protect essential services through backup power, redundant communications, fuel planning, hardening, and mutual aid.	2, 4, 5	Applicable participating jurisdictions, as selected in county annex matrix	Multiple Hazards	Power and communications failure affecting critical services.	Facilities/emergency management	Five County AOG; counties; municipalities; state/federal agencies; utilities or special districts, as applicable	Local capital budget; FEMA HMGP for eligible mitigation projects	Medium term; phased	Moderate to High	High

Action ID	Mitigation Action	Goal(s)	Jurisdiction(s)	Hazard(s)	Vulnerability / Impact Addressed	Responsible Position, Office, Department, or Agency	Potential Partners	Potential Funding Source(s)	Timeframe	Estimated Cost	Priority
FCA-MH-03	Integrate hazard data and actions into general plans, capital programs, development review, budgets, and asset management.	1, 2, 4, 6	Applicable participating jurisdictions, as selected in county annex matrix	Multiple Hazards	Risk information is not consistently used in decisions.	Planning/administration	Five County AOG; counties; municipalities; state/federal agencies; utilities or special districts, as applicable	Local department budget	Ongoing; annual milestone	Low	High
FCA-DF-04	Rehabilitate, stabilize, or otherwise reduce failure risk at priority high-hazard dams through owner-led engineering, permitting, construction, and long-term maintenance.	1, 2, 4	Affected dam owners and participating jurisdictions identified in county annex matrix	Dam Failure	Dam condition or appurtenant works may threaten downstream people, property, and lifelines.	Dam owner/operator	Affected counties and municipalities; Utah dam-safety partners; emergency management	Owner capital program; Utah state programs; FEMA HHPD[135] or other eligible funding	Medium to long term; phased	High	High
FCA-FL-05	Voluntarily acquire, relocate, or retrofit repeatedly flooded or	1, 2, 6	Applicable participating jurisdictions identified in	Flooding	Structures with severe or repetitive flood exposure.	Floodplain administration or local project lead	Property owners; county; Utah; FEMA	Local match; FEMA FMA,[136] HMGP,[137] or other eligible funding	Medium to long term	High	Moderate

[135] HHPD = Rehabilitation of High Hazard Potential Dams grant program
[136] FMA = Flood Mitigation Assistance
[137] HMGP = Hazard Mitigation Grant Program

Action ID	Mitigation Action	Goal(s)	Jurisdiction(s)	Hazard(s)	Vulnerability / Impact Addressed	Responsible Position, Office, Department, or Agency	Potential Partners	Potential Funding Source(s)	Timeframe	Estimated Cost	Priority
	severely at-risk structures and preserve acquired land as open space when feasible.		county annex matrix								
FCA-DR-04	Support agricultural drought resilience through irrigation efficiency, soil-moisture conservation, drought-tolerant practices, producer outreach, and promotion of applicable crop insurance.	2, 3, 6	Applicable counties and agricultural jurisdictions identified in county annex matrix	Drought	Agricultural production, soils, water demand, and farm income exposed to drought.	County extension or conservation lead	USU[138] Extension; conservation districts; NRCS[139]; agricultural producers	Local and producer funds; NRCS or other eligible agricultural programs	Ongoing; annual implementation milestone	Low to Moderate	Moderate
FCA-EH-03	Develop and publish a current list of public cooling locations and operating procedures for activation during	1, 3, 5	Applicable participating jurisdictions identified in county annex matrix	Extreme Heat	Residents and visitors may lack access to climate-controlled space during dangerous heat.	Emergency management or public health	Libraries; senior centers; schools; community organizations	Local budget; public health or other eligible grants	Short term; verify annually before heat season	Low	High

[138] USU = Utah State University
[139] NRCS = Natural Resources Conservation Service

Action ID	Mitigation Action	Goal(s)	Jurisdiction(s)	Hazard(s)	Vulnerability / Impact Addressed	Responsible Position, Office, Department, or Agency	Potential Partners	Potential Funding Source(s)	Timeframe	Estimated Cost	Priority
	severe heat events.										
FCA-WI-04	Develop and distribute a locally tailored wildfire mitigation toolkit for unincorporated communities and neighborhoods, including guidance for local committees, defensible space, and fuels projects.	1, 3, 4	Applicable counties and municipalities identified in county annex matrix	Wildfire	Residents and local groups need actionable guidance and coordination support.	County emergency management or fire service	Fire districts; FFSL[140]; community councils; property owners	County budget; state wildfire programs; eligible grants	Short term; update annually	Low to Moderate	High
FCA-FL-06	Assess detention basins and river or wash crossings at identified priority locations; repair, expand, or replace deficient infrastructure	1, 2, 4	Applicable participating jurisdictions identified in county annex matrix	Flooding	Detention and crossing capacity may be inadequate for current or future runoff and debris loads.	Public works/engineering	County; municipalities; UDOT[141]; NRCS	Local capital budget; CIB[142]; CDBG[143]; FEMA or other eligible grants	Medium term; phased	Moderate to High	High

[140] FFSL = Utah Division of Forestry, Fire and State Lands
[141] UDOT = Utah Department of Transportation
[142] CIB = Permanent Community Impact Fund Board
[143] CDBG = Community Development Block Grant

Action ID	Mitigation Action	Goal(s)	Jurisdiction(s)	Hazard(s)	Vulnerability / Impact Addressed	Responsible Position, Office, Department, or Agency	Potential Partners	Potential Funding Source(s)	Timeframe	Estimated Cost	Priority
	based on findings.										
FCA-LS-04	Prepare and distribute landslide and rockfall risk information for residents, developers, real-estate professionals, and new property owners in mapped hazard areas.	1, 3	Applicable participating jurisdictions identified in county annex matrix	Landslide	Property owners may be unaware of slope, rockfall, and debris-flow hazards and mitigation options.	Emergency management or planning	Utah Geological Survey; developers; real-estate professionals	Local budget; Utah state programs; eligible grants	Short term; update periodically	Low	Moderate
FCA-LS-05	Inventory riverbank and slope stability at priority locations and implement bank stabilization or slope treatments where instability threatens infrastructure or development.	1, 2, 6	Applicable participating jurisdictions identified in county annex matrix	Landslide; Flooding	Erosion and unstable banks or slopes threaten roads, utilities, property, and waterways.	Public works/engineering	NRCS; UGS[144]; landowners; affected municipalities	Local capital budget; NRCS; FEMA or other eligible grants	Medium to long term; phased	High	High

[144] UGS = Utah Geological Survey

Action ID	Mitigation Action	Goal(s)	Jurisdiction(s)	Hazard(s)	Vulnerability / Impact Addressed	Responsible Position, Office, Department, or Agency	Potential Partners	Potential Funding Source(s)	Timeframe	Estimated Cost	Priority
FCA-FL-07	Participate in FEMA Risk MAP,[145] local flood-hazard mapping, and National Flood Insurance Program (NFIP) activities; provide residents and property owners with current flood-risk and NFIP information.	2, 3, 4	Applicable participating jurisdictions identified in county annex matrix	Flooding	Outdated hazard data and limited public understanding of mapped flood risk and insurance options.	Floodplain administrator or planning department	FEMA; Utah Risk MAP Coordinator; county and municipal GIS staff	Local budget; FEMA CTP,[146] FMA, or other eligible funding	Ongoing; annual outreach and mapping coordination	Low to Moderate	High
FCA-FL-08	Install, improve, or replace low-water crossings, flash-flood warning signs, and roadway drainage controls at documented flood-prone routes.	1, 2, 3	Applicable participating jurisdictions identified in county annex matrix	Flooding	Roadways, crossings, and travelers are exposed to rapidly rising water, washouts, and entrapment.	Public works or roads department	UDOT; county; municipalities; law enforcement	Local capital budget; UDOT programs; CIB; CDBG; FEMA or other eligible funding	Medium term; phased	Moderate to High	High

[145] Risk MAP = Risk Mapping, Assessment, and Planning
[146] CTP = Cooperating Technical Partners

Action ID	Mitigation Action	Goal(s)	Jurisdiction(s)	Hazard(s)	Vulnerability / Impact Addressed	Responsible Position, Office, Department, or Agency	Potential Partners	Potential Funding Source(s)	Timeframe	Estimated Cost	Priority
FCA-FL-09	Develop or update a roadway infrastructure capital improvement plan that prioritizes flood-prone culverts, bridges, crossings, and drainage projects.	2, 4, 5	Applicable counties and municipalities identified in county annex matrix	Flooding	Drainage and transportation improvements are not consistently prioritized or programmed for funding.	Public works/engineering	Planning; finance; UDOT; county and municipal partners	Local budget; CIB; CDBG; UDOT; FEMA or other eligible funding	Short to medium term; update annually	Low to Moderate	High
FCA-FL-10	Design and construct sediment and debris basins, relief drains, spillways, floodways, or other flow-control facilities to delay, meter, store, or safely convey severe runoff.	1, 2, 6	Applicable participating jurisdictions identified in county annex matrix	Flooding; Landslide	High sediment and runoff volumes threaten developed areas, roads, and drainage systems.	Public works/engineering	County; municipalities; NRCS; UDOT; landowners	Local capital budget; CIB; CDBG; NRCS; FEMA or other eligible funding	Medium to long term; phased	High	High

Action ID	Mitigation Action	Goal(s)	Jurisdiction(s)	Hazard(s)	Vulnerability / Impact Addressed	Responsible Position, Office, Department, or Agency	Potential Partners	Potential Funding Source(s)	Timeframe	Estimated Cost	Priority
FCA-DR-05	Evaluate and implement managed aquifer recharge using winter runoff, stormwater, infiltration areas, or conveyance improvements where technically feasible and legally authorized.	2, 4, 6	Applicable water systems and jurisdictions identified in county annex matrix	Drought; Flooding	Water supplies are constrained while seasonal runoff may be lost to evaporation or contribute to flooding.	Water utility or public works	Water conservancy districts; state water agencies; irrigation companies; property owners	Local utility budget; Utah water programs; federal water or infrastructure grants, as eligible	Medium to long term; phased	High	Moderate
FCA-DR-06	Establish, maintain, or expand watershed protection zones and coordinate land-use and septic-density controls to protect source-water quality from hazard-related impacts.	1, 2, 6	Applicable counties, municipalities, and water systems identified in county annex matrix	Drought; Wildfire; Flooding; Landslide	Wildfire, erosion, flooding, development, and septic density may degrade watersheds and water quality.	Planning department or water utility	Health department; conservation districts; land-management agencies; municipalities	Local budget; source-water protection programs; state or federal grants, as eligible	Ongoing; review at least annually	Low to Moderate	High

Action ID	Mitigation Action	Goal(s)	Jurisdiction(s)	Hazard(s)	Vulnerability / Impact Addressed	Responsible Position, Office, Department, or Agency	Potential Partners	Potential Funding Source(s)	Timeframe	Estimated Cost	Priority
FCA-EQ-04	Participate annually in the Great Utah ShakeOut or a comparable earthquake exercise and engage local departments, schools, businesses, and residents.	1, 3, 5	Applicable participating jurisdictions identified in county annex matrix	Earthquake	Limited public practice of earthquake protective actions and organizational coordination.	Emergency management	Schools; businesses; healthcare facilities; community organizations	Local budget; Utah earthquake-preparedness programs	Ongoing; annual exercise	Low	Moderate
FCA-EQ-05	Install safety film or other protective glazing treatments in priority public and critical facilities to reduce injuries from shattered glass during earthquakes.	1, 2	Applicable participating jurisdictions identified in county annex matrix	Earthquake	Unprotected glazing may cause injuries and disrupt facility operations.	Facilities department	Building officials; schools; healthcare facilities; qualified contractors	Local capital budget; FEMA HMA or other eligible funding	Medium term; phased	Moderate	Moderate
FCA-EQ-06	Inspect manholes, sewer lines, water tanks, and other utility assets for land-movement and seismic	1, 2, 4	Applicable participating jurisdictions and utilities identified in	Earthquake; Landslide	Utility assets may fail due to ground shaking, settlement, slope instability,	Public works or utility department	Engineers; special service districts; state technical partners	Utility capital budget; CIB; state or federal infrastructure grants, as eligible	Medium term; phased	Moderate to High	High

Action ID	Mitigation Action	Goal(s)	Jurisdiction(s)	Hazard(s)	Vulnerability / Impact Addressed	Responsible Position, Office, Department, or Agency	Potential Partners	Potential Funding Source(s)	Timeframe	Estimated Cost	Priority
	vulnerabilities and implement prioritized stabilization or retrofit measures.		county annex matrix		or differential movement.						
FCA-LS-06	Install or upgrade rockfall catchment systems, barriers, nets, benches, or related slope-protection measures at documented roadway and infrastructure exposure locations.	1, 2	Applicable participating jurisdictions identified in county annex matrix	Landslide	Rockfall from steep slopes threatens road users, access routes, utilities, and adjacent assets.	Roads department or engineering	UDOT; county; municipalities; UGS; land-management agencies	Local capital budget; UDOT programs; FEMA or other eligible funding	Medium to long term; phased	High	High
FCA-WI-05	Offer voluntary parcel- or home-level wildfire risk assessments and site visits to identify defensible-space, access, vegetation, and structure-	1, 3, 4	Applicable participating jurisdictions identified in county annex matrix	Wildfire	Property owners need site-specific information to reduce structure and vegetation vulnerability.	Fire department or fire service district	FFSL; property owners; insurers; community wildfire councils	Local fire budget; Utah wildfire programs; eligible grants	Ongoing; annual implementation target	Low to Moderate	High

Action ID	Mitigation Action	Goal(s)	Jurisdiction(s)	Hazard(s)	Vulnerability / Impact Addressed	Responsible Position, Office, Department, or Agency	Potential Partners	Potential Funding Source(s)	Timeframe	Estimated Cost	Priority
	hardening opportunities.										
FCA-WI-06	Coordinate recurring community cleanup, mechanical thinning, vegetation maintenance, and irrigation-ditch fuel reduction in wildland-urban interface areas.	1, 2, 3, 6	Applicable participating jurisdictions identified in county annex matrix	Wildfire	Accumulated vegetation and unmanaged ditches can carry wildfire into developed areas.	Fire department or public works	Irrigation companies; property owners; community groups; FFSL	Local budget; in-kind labor; state wildfire programs; eligible grants	Ongoing; seasonal or annual treatment milestone	Low to Moderate	High
FCA-MH-04	Establish agreements with churches, schools, community centers, and other suitable facilities for evacuation, sheltering, cooling, or warming use during hazard events.	1, 3, 5	Applicable participating jurisdictions identified in county annex matrix	Multiple Hazards; Extreme Heat; Winter Storms	Some communities have limited publicly controlled shelter and climate-controlled space.	Emergency management	Faith-based organizations; schools; community organizations; public health	Local budget; emergency-management or public-health grants, as eligible	Short term; review annually	Low	High

Action ID	Mitigation Action	Goal(s)	Jurisdiction(s)	Hazard(s)	Vulnerability / Impact Addressed	Responsible Position, Office, Department, or Agency	Potential Partners	Potential Funding Source(s)	Timeframe	Estimated Cost	Priority
FCA-MH-05	Harden and extend public-safety radio, emergency communications, and notification coverage to remote communities and identified coverage gaps.	1, 2, 5	Applicable counties and municipalities identified in county annex matrix	Multiple Hazards	Remote terrain and system gaps may delay warnings, coordination, and emergency response.	Emergency management or public safety communications	Sheriff; fire and EMS[147]; utilities; neighboring jurisdictions; state interoperability partners	Local capital budget; state homeland security or other eligible grants	Medium term; phased	Moderate to High	High
FCA-MH-06	Assess and harden the electric grid and critical energy systems against natural-hazard outages, including sectionalization, redundancy, vegetation management, equipment protection, and backup generation.	1, 2, 4	Applicable participating jurisdictions and utilities identified in county annex matrix	Multiple Hazards; Damaging Winds; Wildfire; Winter Storms	Power loss can interrupt water, wastewater, communications, healthcare, public safety, and other essential services.	Electric utility or facilities department	Municipalities; counties; special service districts; critical-facility operators	Utility capital program; local budget; DOE,[148] FEMA, or other eligible programs	Medium to long term; phased	High	High

[147] EMS = emergency medical services
[148] DOE = U.S. Department of Energy

Action ID	Mitigation Action	Goal(s)	Jurisdiction(s)	Hazard(s)	Vulnerability / Impact Addressed	Responsible Position, Office, Department, or Agency	Potential Partners	Potential Funding Source(s)	Timeframe	Estimated Cost	Priority
FCA-PS-04	Adopt or update a geologic-hazards ordinance establishing mapping, investigation, disclosure, review, and mitigation requirements for development in identified hazard areas.	1, 2, 4, 6	Applicable counties and municipalities identified in county annex matrix	Problem Soils; Landslide; Earthquake	Development may occur without consistent review of problem soils, slope instability, faulting, or other geologic hazards.	Planning/building department	Utah Geological Survey; geotechnical engineers; legal counsel; developers	Local budget; development-review fees; Utah technical assistance	Short term; ongoing administration	Low to Moderate	High

Detailed jurisdiction-specific actions are provided in the applicable county and community sections. Each action identifies what will be done, where or for whom it will be done when applicable, the hazard and documented risk addressed, and the entity responsible for implementation.

7 Plan Maintenance

The Five County Association of Governments (FCAOG) Multi-Jurisdictional Hazard Mitigation Plan is a living framework for reducing natural hazard risk across Beaver, Garfield, Iron, Kane, and Washington Counties and their participating jurisdictions. Plan maintenance connects the regional risk assessment and mitigation strategy to local implementation, changing conditions, and the next plan update. This section establishes the method, schedule, and responsibilities for monitoring, evaluating, and updating the plan; incorporating mitigation into other planning mechanisms; and continuing public participation throughout the planning cycle.

The regional procedures apply to every participating jurisdiction. The county annexes identify jurisdiction-specific actions, integration opportunities, and public involvement approaches. The Five County AOG coordinates regional maintenance, while each jurisdiction retains responsibility for its own decisions, action implementation, local records, and adoption. Implementation remains subject to applicable authorities, technical feasibility, available resources, and local approval processes.

7.1 Maintenance Organization and Responsibilities

The Five County AOG will coordinate a regional plan-maintenance team composed of designated representatives from each participating jurisdiction. The team will maintain continuity with the planning team established during the update and involve emergency management, planning, public works, utilities, building and development review, floodplain management, finance, and other relevant functions. County representatives will support coordination with municipalities, but county coordination does not replace each municipality's responsibility to participate and report on its own actions.

7.1.1 Regional Coordination

The Five County AOG plan-maintenance coordinator will maintain the participant contact roster; schedule regional reviews; distribute reporting materials; compile jurisdiction reports; maintain the regional action, integration, and amendment records; coordinate public access to the plan and maintenance information; and initiate the next comprehensive update. The coordinator will also communicate with the Utah Division of Emergency Management and the State Hazard Mitigation Officer regarding review requirements, proposed amendments, and the next submittal.

CONFIRM BEFORE FINALIZATION: Identify the Five County AOG position responsible for regional coordination, its alternate, and the office responsible for maintaining the official plan and maintenance records. Confirm the team's relationship to existing Five County AOG committees rather than assigning unverified authority to a committee.

7.1.2 Jurisdiction and Action Responsibilities

Each participating jurisdiction will designate a primary plan-maintenance representative and an alternate. The representative will coordinate local review, obtain updates from action lead agencies, identify changes in risk and development, document integration and public involvement, and submit the jurisdiction's annual report to the Five County AOG. The jurisdiction will notify the Five County AOG when contacts change and transfer maintenance records to replacement staff. Small jurisdictions may combine functions or request county or regional assistance while retaining responsibility for their own plan commitments.

Lead agencies identified in the mitigation action tables will track implementation, expenditures and funding, milestones, barriers, and results for their assigned actions. Partner agencies will provide information relevant to their responsibilities. Local governing bodies retain authority over budgets, ordinances, project approvals, and plan adoption. The maintenance team will make recommendations; it will not substitute for legally required local decisions.

7.2 Monitoring Implementation

Monitoring is the routine collection and documentation of implementation information. Each jurisdiction will review its mitigation actions at least annually and provide an action-by-action update using the FCA action identifiers in Section 6.2 and the applicable annex. Regional actions will be tracked by their designated lead agencies. An action selected by multiple jurisdictions will retain separate jurisdiction-specific progress entries so that completion in one community is not reported as completion for all participants.

For each action, the annual record will identify the jurisdiction, action identifier, responsible agency, current status, work completed during the reporting period, remaining milestones, estimated or actual costs where available, funding pursued or secured, implementation barriers, next steps, and any recommended changes to priority or schedule. Completion will be supported by available documentation, such as project closeout records, adopted ordinances, photographs, outreach records, or agency confirmation. An unfunded action will not be described as complete, and absence of a report will not be treated as evidence of progress.

Action status will distinguish completed actions; actions in progress; ongoing activities; actions not started; deferred actions; and actions no longer relevant. Deferred or discontinued actions will include the reason, remaining risk, and any replacement measure. Ongoing activities will describe work performed during the reporting period rather than using "ongoing" as the sole progress description. Completed projects with continuing operation or maintenance needs will identify the responsible function and remaining obligations.

7.2.1 Annual Monitoring Schedule

The first regional monitoring review will occur within 12 months after FEMA approval, with subsequent reviews at least annually. The Five County AOG will distribute the reporting request at least 60 days before the regional review, and jurisdiction representatives will submit local updates at least 30 days before that review. The Five County AOG will follow up on missing reports and provide an alternative written or virtual participation opportunity when a jurisdiction cannot attend. These intervals are regional administrative commitments, not additional federal deadlines.

The regional review will consider action progress, funding and partnership opportunities, shared implementation barriers, integration into other plans, public comments, and recommended corrective steps. The Five County AOG will prepare an annual maintenance summary identifying participating jurisdictions, reports received and outstanding, decisions, assigned follow-up responsibilities, and target completion dates. Each jurisdiction will share its findings with the appropriate local officials and departments to inform the next budget, capital planning, and work-program cycle.

CONFIRM BEFORE FINALIZATION: Confirm the annual review month, first review date once approval is established, reporting intervals, meeting format, and local reporting process. The proposed 60-day and 30-day intervals may be adjusted by the Five County AOG before finalization; retain a definite annual method and schedule.

7.3 Evaluating Plan Effectiveness

Evaluation determines whether the plan remains relevant and whether its strategy and maintenance procedures are working. The regional maintenance team and each jurisdiction will evaluate the plan during the annual review, using action reports, updated hazard and development information, local capability changes, public input, and lessons from recent events. Monitoring establishes what occurred; evaluation identifies what the findings mean for risk reduction and future priorities.

The evaluation will address whether the identified hazards, locations, extent, and vulnerabilities remain accurate; whether new information changes the risk assessment; whether development, population, infrastructure, land use, or service needs have changed exposure; and whether changes in local plans, regulations, staffing, funding, or partnerships affect implementation. The team will also consider changes in future conditions where supported by relevant technical information, including water availability, wildfire and post-fire conditions, and the performance of infrastructure under changing demands.

The team will assess whether goals and action priorities remain appropriate; whether completed or ongoing actions are reducing the intended risk; whether implementation is keeping pace with schedules; whether barriers require revised approaches; and whether important risks lack an implementable action. Evaluation will consider effects on existing and future buildings, critical facilities, community lifelines, natural resources, and people who may have difficulty receiving information or accessing services. Results will be described using documented outcomes where available; benefits or avoided losses will not be presented as measured results without supporting evidence.

Each annual evaluation will identify recommended changes to actions, priorities, responsibilities, integration opportunities, outreach, or maintenance procedures. The record will explain the basis for each recommendation and distinguish an administrative record correction from a proposed amendment requiring further review. Findings will inform the next year's implementation work and the next comprehensive plan update.

7.3.1 Event-Driven Review

An additional review will be initiated when a significant disaster, damaging nondeclared event, new hazard study or map, substantial development change, major infrastructure change, or material capability change indicates that the plan may no longer adequately describe local risk or priorities. The affected jurisdiction will notify the Five County AOG and provide available information once immediate response needs allow. The Five County AOG and affected representatives will determine the scope of review and coordinate with technical partners as needed.

Event-driven review will document observed impacts, the performance of mitigation measures, newly identified vulnerabilities, recovery-related mitigation opportunities, and recommended action or plan changes. It may focus on affected jurisdictions or hazards rather than repeat the entire regional assessment. Findings will be retained in the maintenance record and incorporated into an amendment or the next update as appropriate.

CONFIRM BEFORE FINALIZATION: Confirm the notification and review target after a significant event and the position authorized to convene an additional review. Do not insert a fixed post-disaster deadline that local staff cannot reasonably meet.

7.4 Updating and Amending the Plan

7.4.1 Five-Year Comprehensive Update

Under 44 CFR § 201.6(d)(3), local jurisdictions must review and revise their plans to reflect changes in development, progress in mitigation efforts, and changes in priorities, and resubmit them for approval within five years. The Five County AOG will coordinate the next regional update with participating jurisdictions and the State Hazard Mitigation Officer. The approval and expiration dates in FEMA's approval documentation, rather than the planning-period label on the cover, will control the update schedule.

The Five County AOG will begin organizing the comprehensive update approximately 18 months before the applicable expiration date. The initial work will confirm participating jurisdictions, responsibilities, funding and technical support, required data, outreach methods, and the review and adoption schedule. The target is to provide the complete draft to the state at least six months before expiration, allowing time for state and FEMA review, revisions, and local adoption. These planning targets do not guarantee approval and will be adjusted in coordination with the state to avoid a lapse.

The comprehensive update will review all base-plan sections and jurisdictional annexes. It will document the planning process and participation; refresh hazard, vulnerability, asset, development, and capability information; evaluate changes in priorities; explain the disposition of previous actions; revise goals and mitigation actions as appropriate; document integration since the previous update; and evaluate and revise maintenance procedures. Retained information will be reviewed for continued accuracy rather than carried forward without evaluation.

Each jurisdiction will participate in the update, validate its own content, identify and prioritize jurisdiction-specific actions, support public outreach, and adopt the updated plan through its governing body. The public will have opportunities to contribute during drafting and to review and comment before approval. The Five County AOG will submit the plan through the state review process and retain approval correspondence and adoption documentation for each jurisdiction.

CONFIRM BEFORE FINALIZATION: Insert the verified FEMA approval and expiration dates. Confirm the proposed 18-month and six-month planning targets with the Five County AOG and the state; do not assume a specific 2032 expiration date from the cover alone.

7.4.2 Interim Amendments and New Participants

A jurisdiction or action lead agency may propose an interim change by submitting the affected text or action, the reason for the change, supporting information, and the jurisdictions affected to the Five County AOG coordinator. The maintenance team will evaluate consistency with the risk assessment, goals, local authorities, and existing strategy. Material changes will include an opportunity for public review appropriate to the scope of the change, with comments and responses retained in the record.

The Five County AOG will coordinate proposed amendments with the State Hazard Mitigation Officer to determine applicable state and FEMA review, approval, and adoption requirements before treating a substantive revision as part of the approved plan. Administrative corrections and progress records will be logged separately from changes to approved plan content. The Five County AOG will maintain version control and a change log identifying the date, affected section or action, reason, review disposition, and required approvals. Interim changes do not replace the five-year update or independently extend the plan's approval period.

A jurisdiction seeking to join the approved regional plan will coordinate with the Five County AOG and the state regarding the applicable joining procedures. Its participation, jurisdiction-specific risk and capability information, mitigation actions, public involvement, and adoption will be documented as required. Inclusion in a regional action catalog or contact roster alone will not be represented as FEMA approval of that jurisdiction.

7.5 Integration into Other Planning Mechanisms

Each jurisdiction will incorporate relevant hazard information, mitigation goals, and selected actions into other planning mechanisms when appropriate and within its authority. Integration will occur through both

scheduled plan updates and routine decisions, including development review, infrastructure design, capital programming, budgeting, grant development, and asset management. The jurisdiction-specific integration commitments in the county annexes provide the local starting point; this section establishes the common implementation and reporting process.

During each annual review, the designated representative will coordinate with planning, public works, utilities, building, floodplain management, emergency management, finance, and other applicable functions to identify upcoming plan revisions, projects, budgets, and policy decisions. The representative will provide relevant risk assessment findings and action information to the responsible staff, identify an appropriate integration opportunity, and document the decision and follow-up responsibility. Where a mechanism is not available or integration is not appropriate, the jurisdiction will record the reason and consider another practical opportunity.

General plans, land-use and subdivision regulations, and development review can use hazard areas and vulnerability findings to inform growth, siting, access, drainage, and development standards. Capital improvement, transportation, utility, and facility plans can incorporate selected mitigation projects and resilience measures. Annual budgets and grant applications can connect action priorities with funding and match needs. Wildfire protection, water conservation, watershed, open-space, and natural-resource plans can align risk-reduction priorities. Emergency operations and recovery plans can use risk information and mitigation opportunities without treating response activities alone as a substitute for long-term mitigation.

The annual integration record will identify the jurisdiction; planning mechanism or decision; responsible department or function; relevant hazard information or FCA action; date and stage of review; incorporation completed or proposed; barriers; and next steps. Supporting records may include adopted plan language, ordinances, capital project descriptions, budget items, meeting records, or grant materials. The next update will summarize actual integration since adoption separately from future opportunities, including an explicit statement where integration did not occur.

7.6 Continued Public Participation

The Five County AOG and participating jurisdictions will provide continuing opportunities for residents, property owners, businesses, service providers, community organizations, neighboring communities, and other interested parties to participate in plan maintenance. Public involvement will extend beyond adoption and include annual implementation review, proposed material amendments, and the comprehensive update. Each jurisdiction will use the outreach channels identified in its annex, supplemented by regional coordination where useful.

7.6.1 Plan Access and Ongoing Comments

The Five County AOG will maintain public access to the approved plan and information on how to submit comments. Participating jurisdictions will provide access or direct the public to the regional plan through

their available communication channels. A nondigital review and comment option will be provided through an identified public office or other practical arrangement. Publicly released materials will exclude information restricted by law or information requiring protection, while retaining sufficient information for meaningful review.

The Five County AOG coordinator and jurisdiction representatives will receive comments throughout the planning cycle, retain them in a comment log, and route local concerns to the appropriate jurisdiction. The log will record the date, subject, affected jurisdiction or action, review responsibility, disposition, and any resulting change. Comments requiring immediate operational attention will be referred to the appropriate agency rather than held until the annual plan review.

CONFIRM BEFORE FINALIZATION: Confirm the public plan location, website or access page, comment email or form, responsible receiving office, and nondigital access location. Verify local contact and outreach channels in each annex before publishing them.

7.6.2 Annual Review, Amendments, and Updates

At least annually, each jurisdiction will share an implementation summary and provide a public opportunity to comment on progress, changing risks, and mitigation priorities. The opportunity may be provided through an advertised public meeting, an existing governing-body or planning meeting with a clearly identified mitigation item, or an advertised written comment period. The Five County AOG will coordinate regional notice and access to relevant materials. The public opportunity will inform the annual evaluation rather than merely announce that the review has been completed.

For a material amendment or comprehensive update, Five County AOG and affected jurisdictions will make proposed changes or draft materials available, explain the scope and comment method, and advertise review opportunities before the change is finalized. During the comprehensive update, outreach will occur while the plan is being drafted and before approval. Jurisdictions will use appropriate combinations of websites, public notices, local meetings, utility or service communications, community partners, and other channels documented in their annexes.

Outreach will account for rural and dispersed communities, limited internet access, language and communication needs, and residents or visitors who may not receive routine government messages. Accessible materials, alternative comment methods, and assistance will be provided as practicable. Jurisdictions will retain notices, dates, materials, comments, and records explaining how input was considered. If no comments are received, the record will document the opportunity provided and that result.

7.7 Maintenance Records and Follow-Through

The Five County AOG will maintain the official regional plan, approval and adoption records, contact roster, annual jurisdiction reports, regional evaluation summaries, action tracking records, integration records, public comment dispositions, and amendment log. Each jurisdiction will retain its supporting local

records and provide relevant copies or summaries for the regional record. The record will distinguish verified results, proposed commitments, outstanding information, and recommendations awaiting decision.

At the conclusion of each review, the maintenance team will assign follow-up tasks to the responsible function and identify a target date. The next review will revisit unresolved items, implementation barriers, missing jurisdiction reports, and recommended plan changes. This continuous record will support transparent implementation during the 2027–2032 planning period and provide the factual basis for the next comprehensive update.

Beaver County Annex

County Profile

This county profile summarizes Beaver County's geographic, demographic, economic, infrastructure, and development characteristics as planning context for the jurisdiction-specific risk, capability, and mitigation assessments. Countywide totals describe the assets and populations that could be affected somewhere in the county; they are not estimates of direct exposure to a particular hazard unless the applicable hazard entry identifies a mapped or otherwise documented exposure area.

Geographic Setting and Communities

Beaver County is located in southwestern Utah along the Nevada border and encompasses approximately 2,582.9 square miles, making it one of the larger counties in the state by land area. The county seat and largest community is Beaver, and the incorporated communities include Beaver, Milford, and Minersville. The county's setting includes the Basin and Range landscape in the west and higher mountain terrain along its eastern edge, including the Tushar Range and Mineral Mountains. This varied topography influences land use, transportation patterns, water availability, and natural hazard exposure across the county. Beaver County's location along Interstate 15 provides regional connectivity between northern and southern Utah and supports the movement of people, goods, and emergency services.

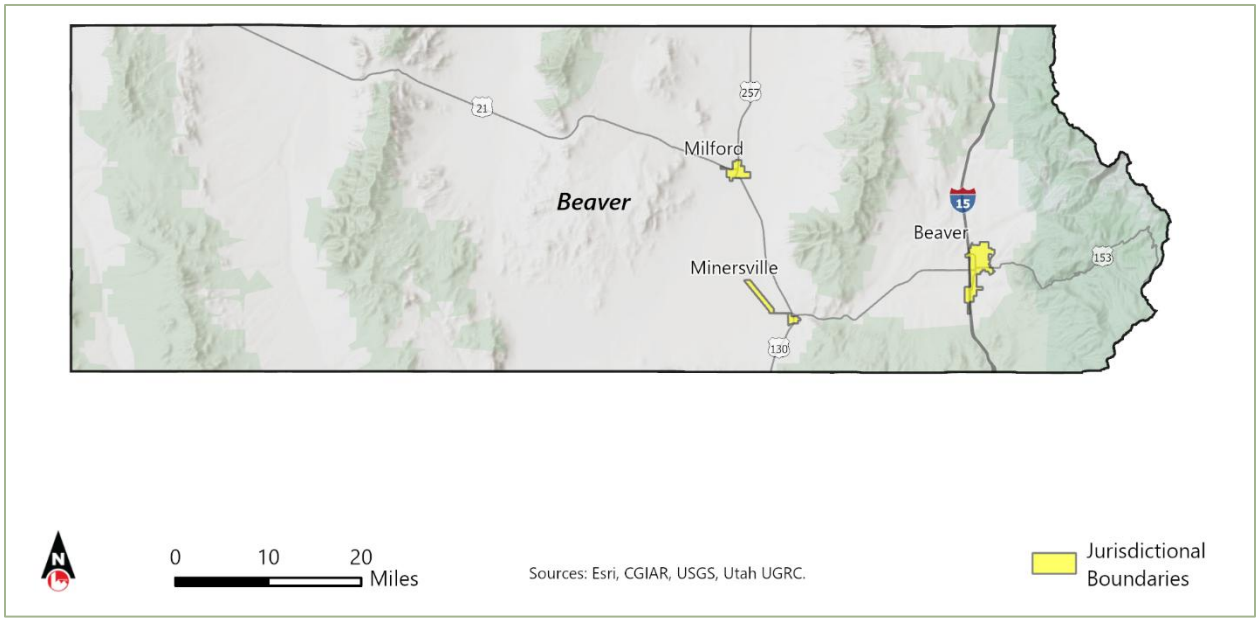


Figure 48: Map of Beaver County and Incorporated Jurisdictions

Population and Housing

The U.S. Census Bureau reports a 2020 Census population of 7,072 and a July 1, 2025 population estimate of 7,301, 3.2% above the 2020 estimates base. The 2020–2024 American Community Survey reports approximately 2,518 households, while the 2025 population estimates report 3,102 housing units. The owner-occupied housing-unit rate was 81.0% in 2020–2024. Persons under age 18 represented 28.1% of the population, and persons age 65 or older represented 17.5%. These characteristics inform outreach, warning, evacuation, sheltering, continuity, and mitigation considerations, particularly for children, older adults, people with access and functional needs, and residents of dispersed rural areas.[149]

Economy and Critical Infrastructure

Beaver County's economy is shaped by agriculture, livestock production, utilities, transportation, mining-related activity, government services, and emerging industrial and logistics development. Recent economic development initiatives, including the Utah Inland Port Authority's Mineral Mountains Project Area, identify growth opportunities near Beaver, Milford, and Minersville that are supported by access to Interstate 15, State Routes 21, 130, 153, 160, and 257, the Union Pacific Railroad corridor, and local airport facilities. Existing community facilities and infrastructure include county and municipal government buildings, schools, law enforcement and fire protection facilities, emergency medical services, utility systems, transportation corridors, and communications infrastructure. These assets are essential to

[149] U.S. Census Bureau, QuickFacts: Beaver County, Utah; July 1, 2025 population and housing estimates (V2025), 2020 Census, and 2020–2024 American Community Survey, as applicable. Age percentages are those reported in QuickFacts. https://www.census.gov/quickfacts/fact/table/beavercountyutah/PST045225. Accessed October 10, 2026.

community lifelines and may be vulnerable to disruption from wildfire, flooding, drought, severe winter weather, earthquake, and other hazards addressed in this plan.[150]

Land Use, Planning, and Mitigation Context

Land use in Beaver County includes incorporated communities, rural residential areas, agricultural lands, rangeland, industrial sites, transportation corridors, and extensive public and undeveloped lands. The Beaver County General Plan and local planning and zoning processes guide growth, development, and infrastructure decisions, while the County Emergency Management program supports preparedness, response, recovery, and mitigation activities.

For hazard mitigation planning purposes, the county profile provides a baseline understanding of where people live, how the county is developing, what facilities and systems are critical to community function, and which social, economic, and physical conditions may influence vulnerability. This information informs the hazard identification, vulnerability assessment, capability assessment, and the selection of mitigation actions tailored to Beaver County and its participating jurisdictions.

Hazard Identification

Each participating jurisdiction considered the hazards profiled for the Five County AOG Region. Table 51 identifies the hazards carried forward for Beaver County, Beaver City, Milford, and Minersville. No participant-specific omission is documented in this annex; therefore, each regional hazard is treated as applicable in this assessment.

Table 51: Hazard Applicability for Beaver County Participants

Plan Participant	Hazard	Rationale for Omitting Hazard
Beaver County	Dam Failure, Damaging Winds, Drought, Earthquake, Extreme Heat, Flooding, Hail, Landslide, Problem Soils, Radon Gas, Thunderstorms and Lightning, Tornadoes, Wildfire, Winter Storms	None; no participant-specific hazard omission is documented.
Beaver City	Dam Failure, Damaging Winds, Drought, Earthquake, Extreme Heat, Flooding, Hail, Landslide, Problem Soils, Radon Gas, Thunderstorms and Lightning, Tornadoes, Wildfire, Winter Storms	None; no participant-specific hazard omission is documented.
City of Milford	Dam Failure, Damaging Winds, Drought, Earthquake, Extreme Heat, Flooding, Hail, Landslide, Problem Soils,	None; no participant-specific

[150] Utah Inland Port Authority, Mineral Mountains Project Area. https://inlandportauthority.utah.gov/mineralmountains/. Utah Code, Title 72, Chapter 4, Part 1, state-highway designations, including §§ 72-4-118, 72-4-121, 72-4-122, and 72-4-133. https://le.utah.gov/xcode/Title72/Chapter4/C72-4-P1_1800010118000101.pdf. Accessed October 9, 2026.

Plan Participant	Hazard	Rationale for Omitting Hazard
	Radon Gas, Thunderstorms and Lightning, Tornadoes, Wildfire, Winter Storms	hazard omission is documented.
Town of Minersville	Dam Failure, Damaging Winds, Drought, Earthquake, Extreme Heat, Flooding, Hail, Landslide, Problem Soils, Radon Gas, Thunderstorms and Lightning, Tornadoes, Wildfire, Winter Storms	None; no participant-specific hazard omission is documented.

Vulnerability and Impact Assessment

The vulnerability assessment identifies what assets, including structures, systems, populations, and other community assets as identified by the community, are at risk from the hazards identified in the plan. The impact assessment describes what potential consequences or effects each hazard could have on the identified assets. In Beaver County, this assessment considers the county and three incorporated municipalities, with major transportation corridors including Interstate 15 and State Routes 21, 130, 153, 160, and 257, and critical public infrastructure that supports community lifelines. A thorough understanding of the vulnerabilities and impacts of each hazard enables the development of effective, targeted mitigation actions to address the specific concerns of each plan participant. More detailed information on the hazards themselves is included in the base plan. The vulnerability and impact assessment identifies the people, structures, critical facilities, infrastructure systems, economic activities, natural resources, and other community assets that may be affected by each applicable hazard. Countywide population, housing, facility, and infrastructure figures provide planning context and should not be interpreted as direct hazard exposure unless supported by a mapped footprint, scenario, or documented event. The regional hazard profiles provide the hazard characteristics, location, extent, previous occurrences, probability, methodology, and future-conditions discussion; this annex supplements those profiles with participant-specific consequences and planning considerations. Facility and infrastructure entries are qualitative planning considerations drawn from the annex inventory. They identify asset types and potential service consequences; they do not represent a verified complete current inventory, a mapped exposure count, or a modeled loss estimate. Inclusion in a county or municipality does not establish that a facility lies within a particular hazard footprint.

Dam Failure

Table 52 summarizes vulnerabilities and potential impacts associated with dam failure for Beaver County participants.

Table 52: Dam Failure Vulnerability and Impact Assessment for Beaver County

Plan Participant	Vulnerabilities and Impacts
Beaver County	**Vulnerabilities:** The Utah Division of Water Rights listing identifies Kent's Lake No. 1, Kent's Lake No. 2, Manderfield, Rocky Ford (Beaver), and Three Creeks as high-hazard-potential dams. Hazard-potential classification describes the consequences of failure or misoperation; it does not describe structural condition or probability of failure. Direct exposure for Beaver County, Beaver City, Milford, and Minersville cannot be inferred from county location alone. Available inundation mapping and emergency action plans define the relevant downstream areas; this annex does not quantify assets within those areas.[151] **Impacts:** A dam incident could produce rapid, life-threatening inundation, erosion, debris, roadway washout, utility interruption, agricultural losses, evacuation with limited warning, and temporary isolation downstream. Failure of a high-hazard-potential dam in Beaver County could cause major damage to homes, agricultural land, roads, bridges, utilities, and other public infrastructure, disrupt access between the county and three incorporated municipalities, and create prolonged service interruptions in rural areas. Consequences would depend on the affected dam, failure mode, warning time, reservoir level, downstream development, and the location and condition of exposed assets. **Critical Facilities and Critical Infrastructure Potentially Impacted:** Roads, bridges, culverts, utilities, irrigation systems, emergency facilities, residences, agricultural operations, and other assets within a documented downstream inundation area. Facility-specific exposure should be reported only after comparison with current inundation mapping or emergency action plans. Beaver Valley Hospital; Beaver County Administration Office; Beaver County Emergency Management/Sheriff's Office facilities; Beaver County Road Department facilities, including the Beaver Road Shed and Milford Road Shed; county-maintained roads and bridges, including paved, gravel, and dirt roadway segments; flood-control and water-storage infrastructure associated with Beaver County dams and reservoirs, including Rocky Ford Dam/Minersville Reservoir, Big Wash Flood Control, Minersville–Red Hills Debris Dam, Minersville–Big Wash Debris Dam, Manderfield (Beaver) Dam, Kent's Lake dams, Three Creeks Dam, Puffer Lake Dam, Anderson Meadow

[151] Utah Division of Water Rights, dam-safety inventory listing, retrieved October 10, 2026. https://www.waterrights.utah.gov/damsafety/nid_list. Hazard-potential ratings describe downstream consequences, not dam condition or failure likelihood.

Plan Participant	Vulnerabilities and Impacts
	Dam, Labaron Dam, South Creek Dam, Blue Lake Dam, Little Reservoir Dam, and related irrigation, drainage, and flood-control conveyance systems.[152]
Beaver City	**Vulnerabilities:** Residential neighborhoods, public facilities, utilities, and transportation routes in and around Beaver City may be vulnerable if upstream dam or water-control infrastructure were to fail. **Impacts:** A dam failure event could result in localized flooding, property damage, loss of access to critical facilities, and disruption to municipal water, transportation, and emergency response functions. **Critical Facilities and Critical Infrastructure Potentially Impacted:** Beaver City Hall; Beaver City Public Works water, sewer, streets, and infrastructure systems; Beaver City water and secondary irrigation infrastructure; Beaver City utility billing and administrative service functions; Beaver City Pool; Beaver Public Library; Tushar Mountain Ball Complex; Canyon Breeze Golf Course; Beaver Fire District #1 Fire House; Beaver Valley Hospital; roadways, bridges, culverts, drainage channels, and local utility corridors within Beaver City that may be affected by dam-failure inundation, debris flows, or related flooding.
City of Milford	**Vulnerabilities:** Milford's developed areas, utility systems, and transportation connections may be vulnerable to flooding or service disruption associated with failure of nearby water-retention or conveyance facilities. **Impacts:** Potential impacts include damage to structures and roads, interruption of public services, temporary displacement, and added response and recovery demands on a small municipal staff. **Critical Facilities and Critical Infrastructure Potentially Impacted:** Milford City Offices/City Hall; Milford City Administrative Office; Milford City water, sewer, garbage, and utility billing systems; Milford wastewater lift station and wastewater project infrastructure; Milford drainage infrastructure, including the 600 North drainage project and drainage conveyance across Highway 257; Beaver County Fire District #2/Milford Fire Department facilities; Beaver County Sheriff's Office–Milford facilities; Milford Memorial Hospital and Milford Ambulance Service; Milford DMV[153]/Justice Court; Milford Public Library; Milford Senior Citizen's Center; Milford Swimming Pool; Milford Municipal Airport–Ben and Judy Briscoe Field; Milford Cemetery; Milford High School and Milford Elementary/School facilities; Rocky Mountain Power service infrastructure; Enbridge Gas Utah service infrastructure; UDOT[154]/transportation corridors including State Route 257, Main Street, local roads, bridges, culverts, drainage channels, and utility corridors that may be affected by dam-failure inundation or related flooding.

[152] Utah Division of Water Rights, National Inventory of Dams list: LABARON (UT00167) and KENT'S LAKE NO. 1 and NO. 2 (UT00161–UT00162). https://www.waterrights.utah.gov/damsafety/nid_list. U.S. Forest Service, LeBaron Campground and Kents Lake Road naming. https://www.fs.usda.gov/r04/fishlake/recreation/lebaron-campground ; https://www.fs.usda.gov/recarea/fishlake/recreation/wateractivities/recarea/?recid=12192&actid=42. Dam inventory names are retained for dams; lake names follow Forest Service usage.

[153] DMV = Division of Motor Vehicles

[154] UDOT = Utah Department of Transportation

Plan Participant	Vulnerabilities and Impacts
Town of Minersville	**Vulnerabilities:** Minersville may be vulnerable where homes, local roads, and supporting utility infrastructure are located near drainageways or dependent on upstream water infrastructure. **Impacts:** Dam failure could cause rapid flooding, access limitations, utility outages, and damage to residences and community facilities, with recovery challenges heightened by limited local capacity. **Critical Facilities and Critical Infrastructure Potentially Impacted:** Minersville Town Office/Town Hall at 60 West Main Street; Minersville Town water utility system, including local water mains, meters, and service connections; Minersville Town streets, culverts, drainage channels, and local utility corridors; Minersville Fire Department/Beaver County Fire District #2 facility at 118 South Center Street; Minersville School facilities; Minersville Lake Park and Minersville Reservoir recreation and access infrastructure; flood-control and debris-retention infrastructure associated with Minersville–Big Wash Debris Dam and Minersville–Red Hills Debris Dam; local transportation routes, bridges, and access roads that may be affected by dam-failure inundation, debris flows, or related flooding.

Damaging Winds

Table 53 summarizes vulnerabilities and potential impacts associated with damaging winds for Beaver County participants.

Table 53: Damaging Winds Vulnerability and Impact Assessment for Beaver County

Plan Participant	Vulnerabilities and Impacts
Beaver County	**Vulnerabilities:** Rural buildings, outbuildings, communications infrastructure, power lines, transportation corridors, and agricultural operations in unincorporated areas are vulnerable to damaging wind events, including vehicle exposure traveling along Interstate 15 and State Routes 21, 130, 153, 160, and 257. **Impacts:** Strong winds may damage roofs and siding, down trees and utility lines, create travel hazards on major routes, and disrupt power and communications across widely dispersed areas serving 7,072 residents and one county government. **Critical Facilities and Critical Infrastructure Potentially Impacted:** Beaver County Administration Office; Beaver County Emergency Management; Beaver County Sheriff's Office and dispatch/public safety functions; Beaver Valley Hospital; Beaver County Road Department facilities, including the Beaver crew and Milford crew road operations; county-maintained road network; bridges, culverts, traffic-control devices, and snow-removal routes; power, communications, water, and other external service infrastructure needed for disaster response and recovery; public buildings, parks and facilities, schools,

Plan Participant	Vulnerabilities and Impacts
	emergency shelters, and utility corridors throughout unincorporated Beaver County that may be affected by damaging winds, windblown debris, downed trees, roof damage, utility interruptions, or blocked transportation routes.
Beaver City	**Vulnerabilities:** Homes, schools, businesses, public facilities (Beaver County Administration Office, Beaver City Hall, Beaver County Sheriff's Office, Southwest Utah Public Health Department) and overhead utilities in Beaver City are vulnerable to high winds, especially where older structures or exposed infrastructure are present. **Impacts:** Damaging winds could result in structural damage, debris hazards, outages, and transportation disruptions that affect residents, businesses, and emergency services. **Critical Facilities and Critical Infrastructure Potentially Impacted:** Beaver City Hall; Beaver City Public Works water, sewer, streets, and infrastructure systems; Beaver City municipal electric system and utility billing/service functions; Beaver City water system; Beaver City Pool; Beaver Public Library; Tushar Mountain Ball Complex; Canyon Breeze Golf Course; Beaver Municipal Airport; Mountain View Cemetery; Beaver Fire District #1 Fire House and emergency response facilities; Beaver Valley Hospital; schools, parks, public buildings, local roads, bridges, culverts, drainage channels, overhead power and communications lines, traffic-control devices, and utility corridors within Beaver City that may be affected by damaging winds, windblown debris, roof damage, downed trees or poles, utility interruptions, or blocked access routes.
City of Milford	**Vulnerabilities:** Milford's housing, utility systems, civic buildings (Milford City Office), and transportation routes are exposed to damaging winds common in open desert and valley settings. **Impacts:** Impacts may include roof and façade damage, blown debris, service interruptions, reduced visibility, and temporary closure of roads or outdoor facilities. **Critical Facilities and Critical Infrastructure Potentially Impacted:** Milford City Offices/City Hall; Milford City Administrative Office; Milford City water, sewer, and garbage utility systems; Milford Municipal Water System; Milford DMV/Justice Court; Beaver County Sheriff's Office–Milford facilities; Beaver County Fire District #2/Milford Fire Department facilities; Milford Memorial Hospital and Milford Ambulance Service; Milford Medical Clinic; Milford Public Library; Milford Senior Citizen's Center; Milford Swimming Pool; Milford High School and Milford Elementary/School facilities; Milford Municipal Airport–Ben and Judy Briscoe Field; Milford Cemetery; Rocky Mountain Power electric service infrastructure; Enbridge Gas Utah natural gas service infrastructure; local communications infrastructure; Main Street, State Route 257, local roads, bridges, culverts, traffic-control devices, drainage channels, overhead power and communication lines, and utility corridors within Milford that may be affected by damaging winds, windblown debris, roof damage, downed trees or poles, utility interruptions, or blocked access routes.

Plan Participant	Vulnerabilities and Impacts
Town of Minersville	**Vulnerabilities:** Minersville is vulnerable where residences, municipal facilities (Minersville Town Hall and Public Library), and utility infrastructure are exposed to high winds without natural windbreaks. **Impacts:** Wind events could damage buildings, interrupt utilities, affect travel safety, and increase cleanup and response needs for the town. **Critical Facilities and Critical Infrastructure Potentially Impacted:** Minersville Town Office/Town Hall at 60 West Main Street; Minersville Town water utility system, including water mains, meters, service connections, and related water service infrastructure; Minersville Fire Department/Beaver County Fire District #2 facility at 118 South Center Street; Minersville School facilities; Minersville public buildings, local parks and recreation areas, and community facilities; Minersville Lake Park and Minersville Reservoir recreation/access infrastructure; local streets, Utah State Route 21, Utah State Route 130, bridges, culverts, drainage channels, traffic-control devices, overhead power and communications lines, and utility corridors within Minersville that may be affected by damaging winds, windblown debris, roof damage, downed trees or poles, utility interruptions, or blocked access routes.

Drought

Table 54 summarizes vulnerabilities and potential impacts associated with drought for Beaver County participants.

Table 54: Drought Vulnerability and Impact Assessment for Beaver County

Plan Participant	Vulnerabilities and Impacts
Beaver County	**Vulnerabilities:** Drought can affect Beaver County countywide by reducing surface-water supplies, snowmelt runoff, soil moisture, forage, reservoir storage, and groundwater recharge. Municipal and domestic water systems, irrigated agriculture, livestock operations, rangelands, fire-protection water supplies, recreation resources, and drought-stressed ecosystems are sensitive to prolonged dry conditions. The severity and location of effects vary over time, so a dated drought-monitor snapshot should not be treated as a fixed exposure estimate. **Impacts:** Prolonged drought can reduce water availability for the county and three incorporated municipalities, agricultural productivity, streamflow, groundwater reliability, reservoir levels, and irrigation delivery; increase pumping, feed, and operating costs; stress crops, rangelands, vegetation, wildlife habitat, and watershed health across the county's 2,582.9 square miles; and compound extreme-heat and wildfire conditions. Municipal and domestic water systems, livestock watering, agricultural producers, and dispersed rural users may face greater operational and financial constraints

Plan Participant	Vulnerabilities and Impacts
	where supplies or delivery systems have limited redundancy, with countywide economic and environmental consequences. **Critical Facilities and Critical Infrastructure Potentially Impacted:** Municipal and community water systems; groundwater wells; reservoirs and irrigation conveyance; livestock water systems; fire-protection water supplies; water-dependent public facilities; agricultural operations; and transportation, electric, and communications systems affected by drought-related wildfire or dust. Beaver County Emergency Management; Beaver County Sheriff's Office and dispatch/public safety functions; Beaver Valley Hospital; Beaver County Road Department facilities and county-maintained roads; Beaver River watershed water-supply infrastructure; Minersville Reservoir; Kents Lake; irrigation reservoirs, irrigation pipelines, diversion structures, livestock pipelines, ponds, streambank stabilization areas, and agricultural water systems serving Beaver County farms and ranches; culinary and secondary water systems serving county communities; groundwater wells and shared aquifer resources in Beaver County valleys, including Pine Valley, Wah Wah Valley, and Hamlin Valley; public buildings, emergency shelters, livestock and agricultural operations, recreation areas, and transportation corridors that may be affected by reduced water availability, water-use restrictions, low reservoir levels, reduced streamflow, or drought-related wildfire conditions.
Beaver City	**Vulnerabilities:** Beaver City may be vulnerable to drought-related water shortages affecting municipal supplies, landscaping, public facilities, and nearby agricultural activity that supports the community. Because drought conditions affect the county broadly, Beaver City is exposed to the same countywide drought stressors affecting water-dependent systems through reduced snowpack, runoff, and soil moisture. **Impacts:** Extended drought could increase water conservation needs, raise utility and maintenance costs, reduce vegetation health, limit irrigation and landscaping, and contribute to broader economic and wildfire-related consequences that affect residents, businesses, and public services. **Critical Facilities and Critical Infrastructure Potentially Impacted:** Beaver City Hall; Beaver City Public Works water, sewer, streets, and infrastructure systems; Beaver City Water System; Beaver City secondary irrigation/outdoor watering system; Beaver City Municipal Electric; Beaver City utility billing and administrative service functions; Beaver River water-supply and irrigation infrastructure serving Beaver City; city parks and recreation facilities, including Beaver City Pool, Tushar Mountain Ball Complex, Canyon Breeze Golf Course, and park pavilions; Beaver Public Library; Mountain View Cemetery; Beaver Fire District #1 Fire House and emergency response facilities; Beaver Valley Hospital; schools, public buildings, local roads, utility corridors, and landscaped public areas that may be affected by reduced water availability, water-use restrictions, low streamflow, irrigation shortages, drought stress, or drought-related wildfire conditions.
City of Milford	**Vulnerabilities:** Milford is vulnerable to drought impacts on municipal water systems, household water use, landscaping, and surrounding agricultural and

Plan Participant	Vulnerabilities and Impacts
	industrial activities. Countywide drought exposure includes widespread stress on irrigated acreage, livestock operations, and water-dependent systems, which can affect Milford's service demands and local economy during prolonged dry periods. **Impacts:** Drought may lead to water restrictions, increased operational costs, reduced agricultural productivity, greater pressure on municipal supplies, and heightened risk of dust, heat, and wildfire-related conditions that affect residents and businesses. **Critical Facilities and Critical Infrastructure Potentially Impacted:** Milford City Offices/City Hall; Milford City Administrative Office; Milford City water, sewer, and garbage utility systems; Milford Municipal Water System; Milford City culinary water wells, storage tanks, meters, service connections, and distribution mains; Milford wastewater system and lift station infrastructure; city park irrigation system and irrigation infrastructure serving the golf course, schools, parks, and cemetery; Milford DMV/Justice Court; Beaver County Sheriff's Office–Milford facilities; Beaver County Fire District #2/Milford Fire Department facilities; Milford Memorial Hospital and Milford Ambulance Service; Milford Medical Clinic; Milford Public Library; Milford Senior Citizen's Center; Milford Swimming Pool; Milford High School and Milford Elementary/School facilities; Milford Municipal Airport–Ben and Judy Briscoe Field; Milford Cemetery; Rocky Mountain Power electric service infrastructure; Enbridge Gas Utah natural gas service infrastructure; local communications infrastructure; agricultural and livestock water systems, local roads, drainage corridors, and utility corridors that may be affected by reduced water availability, water-use restrictions, declining groundwater levels, irrigation shortages, drought stress, or drought-related wildfire conditions.
Town of Minersville	**Vulnerabilities:** Minersville is vulnerable where local water resources, vegetation, and nearby agricultural lands are stressed by prolonged dry conditions. As drought affects a majority of Beaver County at once, Minersville may experience concurrent pressure on municipal supply, irrigation needs, and surrounding ranching and farming operations that depend on limited water availability. **Impacts:** Drought can affect water reliability, increase landscape and wildfire risk, reduce agricultural productivity, place added pressure on local budgets and community resilience, and contribute to broader environmental and economic stress during prolonged dry periods. **Critical Facilities and Critical Infrastructure Potentially Impacted:** Minersville Town Office/Town Hall at 60 West Main Street; Minersville Town water utility system, including groundwater supply, water mains, meters, service connections, and related water service infrastructure; Minersville Reservoir and associated irrigation, recreation, and access infrastructure; Minersville Reservoir & Irrigation Company infrastructure; Beaver River water-supply and irrigation infrastructure serving the Minersville area; Minersville Fire Department/Beaver County Fire District #2 facility at 118 South Center Street; Minersville School facilities; public buildings, parks, community

Plan Participant	Vulnerabilities and Impacts
	facilities, local streets, drainage corridors, agricultural and livestock water systems, and utility corridors that may be affected by reduced water availability, water-use restrictions, low reservoir levels, declining groundwater levels, irrigation shortages, drought stress, or drought-related wildfire conditions.

Earthquake

Table 55 summarizes vulnerabilities and potential impacts associated with earthquake for Beaver County participants.

Table 55: Earthquake Vulnerability and Impact Assessment for Beaver County

Plan Participant	Vulnerabilities and Impacts
Beaver County	**Vulnerabilities:** Damaging earthquake shaking may affect people and assets throughout Beaver County. The county lies within the broader zone of seismic influence associated with the Intermountain Seismic Belt, and structures, bridges, utilities, pipelines, communications systems, and transportation routes throughout Beaver County, including Interstate 15 and State Routes 21, 130, 153, 160, and 257, are vulnerable to ground shaking, surface failure, and related infrastructure damage. People and assets throughout Beaver County may experience earthquake shaking, although intensity and damage will vary by event, location, soil conditions, and building characteristics. **Impacts:** Earthquake could damage buildings and lifelines, interrupt utilities and transportation, and require costly inspection, repair, and recovery actions. The countywide population of 7,301 and inventory of 3,102 housing units in 2025 provide planning context; the number affected would depend on the earthquake scenario, shaking intensity, ground conditions, and building vulnerability.[155] **Critical Facilities and Critical Infrastructure Potentially Impacted:** Beaver County Administration Office; Beaver County Emergency Management; Beaver County Sheriff's Office, dispatch, Beaver County Jail, Search & Rescue, and other public safety facilities; Beaver Valley Hospital; Milford Memorial Hospital; Beaver County Road Department facilities, including the Beaver Road Shed and Milford Road Shed; county-maintained roads, bridges, culverts, and access routes; county public buildings, parks/facilities, emergency shelters, schools, and community facilities; water, wastewater, electric power, natural gas, communications, and fuel-distribution lifeline infrastructure; dams, reservoirs, irrigation conveyance systems, and flood-control/debris-retention structures, including Rocky Ford Dam/Minersville

[155] U.S. Census Bureau, QuickFacts: Beaver County, Utah; July 1, 2025 population and housing estimates (V2025), 2020 Census, and 2020–2024 American Community Survey, as applicable. Age percentages are those reported in QuickFacts. https://www.census.gov/quickfacts/fact/table/beavercountyutah/PST045225. Accessed October 10, 2026.

Plan Participant	Vulnerabilities and Impacts
	Reservoir, Kent's Lake dams, Manderfield (Beaver) Dam, Three Creeks Dam, Puffer Lake Dam, Anderson Meadow Dam, Labaron Dam, South Creek Dam, Blue Lake Dam, Little Reservoir Dam, Minersville–Big Wash Debris Dam, and Minersville–Red Hills Debris Dam that may be affected by ground shaking, structural damage, liquefaction, slope failure, utility disruption, or blocked transportation access.[156]
Beaver City	**Vulnerabilities:** Beaver City's homes, schools, public buildings, utilities, and transportation infrastructure are vulnerable to earthquake shaking, particularly where older construction or buried infrastructure is present. Historical earthquake records cited in the regional profile indicate local and nearby seismic activity; the regional profile should be used for verified event dates, magnitudes, and locations. People and assets in Beaver City may experience earthquake shaking, although intensity and damage will vary by event, location, soil conditions, and building characteristics. **Impacts:** Potential impacts include structural damage, disruption of water and sewer service, roadway damage, injuries, and reduced access to critical facilities and emergency response resources. Even moderate local events can create debris, utility outages, and repair costs that affect residents, schools, businesses, and daily community functions. **Critical Facilities and Critical Infrastructure Potentially Impacted:** Beaver City Hall; Beaver City Public Works water, sewer, streets, and infrastructure systems; Beaver City Water System; Beaver City Municipal Electric, including Lower Hydro 1, Middle Hydro 2, Upper Hydro 3, and related electric distribution infrastructure; Beaver City utility billing and administrative service functions; Beaver City Pool; Beaver Public Library; Tushar Mountain Ball Complex; Canyon Breeze Golf Course; Beaver Municipal Airport; Mountain View Cemetery; Beaver Fire District #1 Fire House and emergency response facilities; Beaver Valley Hospital; schools, public buildings, parks, local roads, bridges, culverts, drainage channels, water and sewer lines, overhead and underground electric facilities, natural gas service infrastructure, communications lines, and utility corridors within Beaver City that may be affected by ground shaking, structural damage, liquefaction, slope failure, utility disruption, or blocked transportation access.
City of Milford	**Vulnerabilities:** Milford may be vulnerable to earthquake damage affecting residences, civic buildings, utilities, and transportation connections serving the community and surrounding economic activity. Historical earthquake records cited in the regional profile indicate local seismic activity; the regional profile should be used for verified event dates, magnitudes, and locations. People and assets in Milford may experience earthquake shaking, although intensity

[156] Utah Division of Water Rights, National Inventory of Dams list: LABARON (UT00167) and KENT'S LAKE NO. 1 and NO. 2 (UT00161–UT00162). https://www.waterrights.utah.gov/damsafety/nid_list. U.S. Forest Service, LeBaron Campground and Kents Lake Road naming. https://www.fs.usda.gov/r04/fishlake/recreation/lebaron-campground; https://www.fs.usda.gov/recarea/fishlake/recreation/wateractivities/recarea/?recid=12192&actid=42. Dam inventory names are retained for dams; lake names follow Forest Service usage.

Plan Participant	Vulnerabilities and Impacts
	and damage will vary by event, location, soil conditions, and building characteristics. **Impacts:** Earthquake impacts could include building damage, utility outages, service interruption, debris, and recovery costs that strain local response and repair capacity. Damage to transportation routes or municipal systems could also disrupt community services and economic activity in and around Milford. **Critical Facilities and Critical Infrastructure Potentially Impacted:** Milford City Offices/City Hall at 26 South 100 West; Milford City Administrative Office; Milford City water, sewer, and garbage utility systems; Milford Municipal Water System, including culinary water wells, storage tanks, meters, service connections, and distribution mains; Milford wastewater system and lift station infrastructure; Milford DMV/Justice Court; Beaver County Sheriff's Office–Milford facilities; Beaver County Milford Administration Office; Beaver County Fire District #2/Milford Fire Department facilities; Milford Memorial Hospital and Milford Ambulance Service; Milford Medical Clinic; Milford Public Library; Milford Senior Citizen's Center; Milford Swimming Pool; Milford High School and Milford Elementary/School facilities; Milford Municipal Airport–Ben and Judy Briscoe Field; Milford Cemetery; Rocky Mountain Power electric service infrastructure; Enbridge Gas Utah natural gas service infrastructure; local communications infrastructure; Main Street, State Route 257, local roads, bridges, culverts, drainage channels, rail access, airport access roads, water and sewer lines, electric power and communications lines, and utility corridors within Milford that may be affected by ground shaking, structural damage, liquefaction, slope failure, utility disruption, or blocked transportation access.
Town of Minersville	**Vulnerabilities:** Minersville is vulnerable where homes, town facilities, roads, and utility infrastructure may be affected by ground shaking or ground failure. People and assets in Minersville may experience earthquake shaking, although intensity and damage will vary by event, location, soil conditions, and building characteristics. **Impacts:** Earthquake could damage structures and infrastructure, interrupt essential services, and create access and recovery challenges for residents and local government. Even moderate nearby events could affect utilities, local roads, and community facilities while increasing emergency response and repair demands. **Critical Facilities and Critical Infrastructure Potentially Impacted:** Minersville Town Office/Town Hall at 60 West Main Street; Minersville Town water utility system, including groundwater supply, water mains, meters, service connections, and related water service infrastructure; Minersville Fire Department/Beaver County Fire District #2 facility at 118 South Center Street; Minersville School facilities; Minersville public buildings, parks, community facilities, and local government service functions; Minersville Reservoir and associated irrigation, recreation, and access infrastructure; Minersville Reservoir & Irrigation Company infrastructure; Beaver River water-supply and irrigation infrastructure serving the Minersville area; local streets, Utah State Route 21, Utah State Route 130, bridges, culverts, drainage channels, water

Plan Participant	Vulnerabilities and Impacts
	lines, utility corridors, overhead and underground power and communications infrastructure, and access routes that may be affected by ground shaking, structural damage, liquefaction, slope failure, utility disruption, or blocked transportation access.

Extreme Heat

Table 56 summarizes vulnerabilities and potential impacts associated with extreme heat for Beaver County participants.

Table 56: Extreme Heat Vulnerability and Impact Assessment for Beaver County

Plan Participant	Vulnerabilities and Impacts
Beaver County	**Vulnerabilities:** Beaver County's lower-elevation valleys regularly experience hot summer conditions. Older adults, children, people with chronic health conditions, people without reliable cooling, outdoor workers, emergency responders, livestock, and water- and energy-dependent facilities can be especially sensitive. The regional extreme-heat profile provides the controlling historical climate and projection methods; countywide demographic totals provide planning context rather than direct estimates of heat illness or facility failure. **Impacts:** Extreme heat can increase heat-related illness, cooling and water demand, equipment stress, pavement deterioration, livestock and crop stress, cooling costs, and economic hardship for agriculture- and construction-related industries. Countywide planning context includes 7,072 residents in 2020 and 3,102 housing units; these totals do not represent direct heat exposure. Heat can reduce the safety and productivity of outdoor work and emergency response and compound drought and wildfire risk. Increasing temperatures may lengthen or intensify hazardous heat, but local consequences vary with elevation, building characteristics, access to cooling, infrastructure capacity, and preparedness. **Critical Facilities and Critical Infrastructure Potentially Impacted:** Healthcare and emergency facilities; senior and community facilities; schools; water and wastewater systems; electric power and communications; roads; parks and outdoor facilities; agricultural and livestock operations; and occupied buildings without reliable cooling. Beaver County Administration Office; Beaver County Emergency Management; Beaver County Sheriff's Office, dispatch, Beaver County Jail, Search & Rescue, and public safety facilities; Beaver Valley Hospital; Milford Memorial Hospital; Beaver County Road Department facilities, including the Beaver Road Shed and Milford Road Shed; county-maintained roads, bridges, culverts, and access routes; county public buildings, parks/facilities, emergency shelters, schools, senior/community facilities, water and wastewater systems, electric power and communications infrastructure, fuel-distribution and emergency-service

Plan Participant	Vulnerabilities and Impacts
	support infrastructure, agricultural and livestock water systems, and transportation corridors that may be affected by extreme heat, heat-related power demand, roadway surface damage, reduced water availability, equipment strain, or service disruptions.
Beaver City	**Vulnerabilities:** Beaver City residents without reliable cooling, people with medical conditions, children, older adults, and outdoor workers may be especially sensitive to extreme heat. Exposure and consequences vary with elevation, building characteristics, cooling access, occupation, and duration of the event. **Impacts:** Heat can increase medical calls and emergencies, cooling and municipal water demand, equipment stress, and risks to outdoor work and recreation; affect public facilities; require cooling assistance or public messaging; and reduce comfort and productivity for residents and businesses. Future temperatures may increase the frequency or duration of hazardous heat, but local effects should be interpreted using the methods and sources in the regional extreme-heat profile. **Critical Facilities and Critical Infrastructure Potentially Impacted:** Healthcare and emergency facilities; schools, libraries, and community facilities; municipal water, wastewater, and electric systems; roads; parks and recreation facilities; and occupied buildings without reliable cooling. Beaver City Hall; Beaver City Public Works water, sewer, streets, and infrastructure systems; Beaver City Water System, including water lines, meters, pumps, tanks, springs, wells, and service connections; Beaver City sewer system, including sewer lagoon and lift-station infrastructure; Beaver City Municipal Electric, including Lower Hydro 1, Middle Hydro 2, Upper Hydro 3, and related electric distribution infrastructure; Beaver City utility billing and administrative service functions; Beaver City Pool; Beaver Public Library; Tushar Mountain Ball Complex; Canyon Breeze Golf Course; Beaver Municipal Airport; Mountain View Cemetery; Beaver Fire District #1 Fire House and emergency response facilities; Beaver Valley Hospital; schools, parks, public buildings, local roads, sidewalks, utility corridors, communications infrastructure, and landscaped public areas that may be affected by extreme heat, heat-related power demand, equipment strain, reduced water availability, outdoor water restrictions, pavement damage, or service disruptions.
City of Milford	**Vulnerabilities:** Milford is vulnerable to extreme heat due to exposed outdoor conditions, sensitive populations, and the need to maintain reliable water and power service during high temperatures. Outdoor workers, travelers, and people without reliable cooling are susceptible to heat illness during hot periods. **Impacts:** Potential impacts include heat-related illness, increased cooling demand, stress on infrastructure, and reduced comfort and safety for residents and workers. Prolonged heat may also affect outdoor labor, public facilities, landscaping, and nearby agricultural or industrial activity tied to the Milford area.

Plan Participant	Vulnerabilities and Impacts
	Critical Facilities and Critical Infrastructure Potentially Impacted: Milford City Offices/City Hall at 26 South 100 West; Milford City Administrative Office; Milford City water, sewer, and garbage utility systems; Milford Municipal Water System, including culinary water wells, storage tanks, meters, service connections, and distribution mains; Milford wastewater system and lift station infrastructure; city park irrigation system and irrigation infrastructure serving the golf course, schools, parks, and cemetery; Milford DMV/Justice Court; Beaver County Sheriff's Office–Milford facilities; Beaver County Milford Administration Office; Beaver County Fire District #2/Milford Fire Department facilities; Milford Memorial Hospital and Milford Ambulance Service; Milford Medical Clinic; Milford Public Library; Milford Senior Citizen's Center; Milford Swimming Pool; Milford High School and Milford Elementary/School facilities; Milford Municipal Airport–Ben and Judy Briscoe Field; Milford Cemetery; Rocky Mountain Power electric service infrastructure; Enbridge Gas Utah natural gas service infrastructure; local communications infrastructure; Main Street, State Route 257, local roads, sidewalks, drainage corridors, airport access roads, water and sewer lines, electric power and communications lines, and utility corridors within Milford that may be affected by extreme heat, heat-related power demand, equipment strain, reduced water availability, outdoor water restrictions, pavement damage, or service disruptions.
Town of Minersville	**Vulnerabilities:** Minersville residents, outdoor workers, community facilities, utilities, agriculture, and livestock may be affected during sustained high temperatures, particularly where reliable cooling, water, or backup power is limited. **Impacts:** Extreme heat can increase illness, water and power demand, equipment stress, wildfire potential, and local preparedness and response needs. It can reduce the safety and productivity of outdoor work, stress public services, and affect nearby ranching and farming activity. Future temperatures may increase hazardous-heat conditions, but local effects should be interpreted using the regional profile's methods and sources. **Critical Facilities and Critical Infrastructure Potentially Impacted:** Town offices and community facilities; fire and emergency services; schools; water systems; electric and communications systems; roads; recreation facilities; and agricultural and livestock operations. Minersville Town Office/Town Hall at 60 West Main Street; Minersville Town water utility system, including groundwater supply, water mains, meters, service connections, and related water service infrastructure; Minersville Fire Department/Beaver County Fire District #2 facility at 118 South Center Street; Minersville School facilities; Minersville public buildings, parks, community facilities, and local government service functions; Minersville Reservoir and associated irrigation, recreation, campground, boat ramp, culinary water, restroom, shower, sewage disposal, fish-cleaning, electric hookup, and access infrastructure; Minersville Reservoir & Irrigation Company infrastructure; Beaver River water-supply and irrigation infrastructure serving the Minersville area; local streets, Utah State Route 21, Utah State Route 130, sidewalks, drainage corridors, water lines, utility

Plan Participant	Vulnerabilities and Impacts
	corridors, overhead and underground power and communications infrastructure, and access routes that may be affected by extreme heat, heat-related power demand, equipment strain, reduced water availability, outdoor water restrictions, pavement damage, or service disruptions.

Flooding

Table 57 summarizes vulnerabilities and potential impacts associated with flooding for Beaver County participants.

Table 57: Flooding Vulnerability and Impact Assessment for Beaver County

Plan Participant	Vulnerabilities and Impacts
Beaver County	**Vulnerabilities:** Vulnerability is concentrated along mapped floodplains, agricultural bottoms, roadway crossings, creeks, and normally dry washes where runoff from snowmelt and short-duration storms can produce localized flooding, erosion, and sedimentation. Post-fire debris flows are also possible near the mountainous east side of the county. Flooding can affect low-lying roads, irrigation features, agricultural lands, and developed areas, including critical transportation links along Interstate 15 and State Routes 21, 130, 153, 160, and 257. **Impacts:** Documented flood disaster history in Beaver County includes Presidential Disaster Declarations in 1983 and 2005, demonstrating recurring exposure to snowmelt, rain-on-snow, and severe storm flooding. Flooding can damage roads, bridges, culverts, agricultural land, utilities, homes, and public facilities, threaten access between the county and three incorporated municipalities, and disrupt emergency response across Beaver County's 2,582.9 square miles. Even localized flood events can create erosion, roadway washouts, and service interruptions in rural parts of the county. In July 2026, flash flooding and debris flows severely damaged or washed away sections of State Route 153 through Beaver Canyon. UDOT reported an indefinite closure on July 21 and began emergency repair work in August; its August 28 update stated that the west side would remain closed to general and recreational travel for the remainder of 2026. The event demonstrates the potential for post-fire runoff, channel erosion, and slope instability to disrupt mountain access and transportation infrastructure.[157][158]

[157] Utah Department of Transportation, "SR-153 through Beaver Canyon closed indefinitely after flooding washes out road," July 21, 2026; "Emergency repair work begins on SR-153 in Beaver Canyon," August 28, 2026, https://connect.udot.utah.gov/2026/07/21/sr-153-through-beaver-canyon-closed-indefinitely-after-flooding-washes-out-road/ ; https://connect.udot.utah.gov/2026/08/28/emergency-repair-work-begins-on-sr-153-in-beaver-canyon/.
[158] FEMA, OpenFEMA Disaster Declarations Summaries, version 2, Utah records, retrieved October 10, 2026, https://www.fema.gov/openfema-data-page/disaster-declarations-summaries-v2.

Plan Participant	Vulnerabilities and Impacts
	Critical Facilities and Critical Infrastructure Potentially Impacted: Beaver County Administration Office; Beaver County Emergency Management; Beaver County Sheriff's Office, dispatch, Beaver County Jail, Search & Rescue, and other public safety facilities; Beaver Valley Hospital; Milford Memorial Hospital; Beaver County Road Department facilities, including the Beaver Road Shed and Milford Road Shed; county-maintained roads, bridges, culverts, drainage facilities, and access routes; Beaver County Special Service District #7 transportation, drainage, and flood-control facilities; county public buildings, parks/facilities, emergency shelters, schools, water and wastewater systems, electric power, natural gas, communications, and fuel-distribution lifeline infrastructure; dams, reservoirs, irrigation conveyance systems, stream crossings, flood-control channels, and debris-retention structures, including Rocky Ford Dam/Minersville Reservoir, Kent's Lake dams, Manderfield (Beaver) Dam, Three Creeks Dam, Puffer Lake Dam, Anderson Meadow Dam, Labaron Dam, South Creek Dam, Blue Lake Dam, Little Reservoir Dam, Minersville–Big Wash Debris Dam, and Minersville–Red Hills Debris Dam that may be affected by riverine flooding, flash flooding, debris flows, erosion, culvert overtopping, road washouts, utility disruption, or blocked emergency access.[159]
Beaver City	**Vulnerabilities:** Beaver City is vulnerable where homes, streets, drainage systems, public facilities, and transportation routes are located near creeks, drainageways, or areas with limited stormwater capacity. Localized flooding may also occur from short-duration, high-intensity rainfall, runoff from nearby slopes, or overflow at roadway crossings and culverts. **Impacts:** Flooding may damage structures and roads, overwhelm drainage systems, interrupt utilities, and limit access to critical facilities and emergency services. Even localized events can create erosion, sediment deposition, temporary roadway closures, and increased maintenance and repair costs for the city. **Critical Facilities and Critical Infrastructure Potentially Impacted:** Beaver City Hall at 30 West 300 North; Beaver City Public Works water, sewer, streets, and infrastructure systems; Beaver City Water System, including water lines, meters, pumps, tanks, springs, wells, and service connections; Beaver City sewer system, including sewer lagoon and lift-station infrastructure; Beaver City Municipal Electric, including Lower Hydro 1, Middle Hydro 2, Upper Hydro 3, 46 kV[160] meter structure, and related electric distribution infrastructure; Beaver City utility billing and administrative service functions; Beaver City Pool; Beaver Public Library; Tushar Mountain Ball Complex; Canyon Breeze Golf Course; Beaver Municipal Airport; Mountain View

[159] Utah Division of Water Rights, National Inventory of Dams list: LABARON (UT00167) and KENT'S LAKE NO. 1 and NO. 2 (UT00161–UT00162), https://www.waterrights.utah.gov/damsafety/nid_list. U.S. Forest Service, LeBaron Campground and Kents Lake Road naming, https://www.fs.usda.gov/r04/fishlake/recreation/lebaron-campground; https://www.fs.usda.gov/recarea/fishlake/recreation/wateractivities/recarea/?recid=12192&actid=42. Dam inventory names are retained for dams; lake names follow Forest Service usage.

[160] kV = kilovolt

Plan Participant	Vulnerabilities and Impacts
	Cemetery; Beaver Fire District #1 Fire House and emergency response facilities; Beaver Valley Hospital at 1109 North 100 West; schools, parks, public buildings, local roads, bridges, culverts, drainage channels, Beaver River stream crossings, water and sewer lines, electric power and communications lines, and utility corridors within Beaver City that may be affected by riverine flooding, flash flooding, stormwater ponding, culvert overtopping, erosion, road washouts, utility disruption, or blocked emergency access.
City of Milford	**Vulnerabilities:** Milford may be vulnerable to localized flooding affecting residences, streets, drainage infrastructure, utility systems, and transportation connections during intense rainfall, snowmelt, or runoff events. Because flood impacts in Beaver County often occur at roadway crossings, along agricultural bottoms, and in normally dry washes, Milford may also be affected by erosion, culvert overtopping, or limited drainage capacity. **Impacts:** Potential impacts include water damage to property, roadway closures, utility disruption, erosion, and added response and maintenance costs. Flooding may also affect access to public facilities, local services, and surrounding agricultural areas that support the Milford community. **Critical Facilities and Critical Infrastructure Potentially Impacted:** Milford City Offices/City Hall at 26 South 100 West; Milford City Administrative Office; Milford City water, sewer, and garbage utility systems; Milford Municipal Water System, including culinary water wells, storage tanks, meters, service connections, and distribution mains; Milford wastewater system, sewer lagoon, Little League Lift Station, Industrial Park Lift Station, headworks, metering station, interceptor sewer, and related sewer collection infrastructure; Milford drainage infrastructure, including the 600 North drainage project, Main Street/Highway 257 drainage crossing, culverts, stormwater conveyance, and drainage channels; Milford DMV/Justice Court; Beaver County Sheriff's Office–Milford facilities; Beaver County Milford Administration Office; Beaver County Fire District #2/Milford Fire Department facilities; Milford Memorial Hospital and Milford Ambulance Service; Milford Medical Clinic; Milford Public Library; Milford Senior Citizen's Center; Milford Swimming Pool; Milford High School and Milford Elementary/School facilities; Milford Municipal Airport–Ben and Judy Briscoe Field; Milford Cemetery; Rocky Mountain Power electric service infrastructure; Enbridge Gas Utah natural gas service infrastructure; local communications infrastructure; Main Street, State Route 257, local roads, bridges, culverts, drainage corridors, rail access, airport access roads, water and sewer lines, electric power and communications lines, and utility corridors within Milford that may be affected by riverine flooding, flash flooding, stormwater ponding, culvert overtopping, erosion, road washouts, utility disruption, sewer backup, or blocked emergency access.

Plan Participant	Vulnerabilities and Impacts
Town of Minersville	**Vulnerabilities:** Minersville is vulnerable where buildings, roads, local infrastructure, and nearby agricultural areas are located in low-lying areas or near channels that can convey runoff during storm or snowmelt events. Localized flooding may occur at roadway crossings, along drainageways, and in areas where runoff concentrates quickly. **Impacts:** Flooding could damage property and transportation routes, affect utilities, isolate portions of the community, and increase recovery needs. Even smaller flood events may create erosion, culvert or drainage problems, roadway access limitations, and added repair demands for local government and residents. **Critical Facilities and Critical Infrastructure Potentially Impacted:** Minersville Town Office/Town Hall at 60 West Main Street; Minersville Town water utility system, including groundwater supply, water mains, meters, service connections, and related water service infrastructure; Minersville Fire Department/Beaver County Fire District #2 facility at 118 South Center Street; Minersville School facilities; Minersville public buildings, parks, community facilities, and local government service functions; Minersville Reservoir and associated irrigation, recreation, campground, boat ramp, culinary water, restroom, shower, sewage disposal, fish-cleaning, electric hookup, and access infrastructure; Minersville Reservoir & Irrigation Company infrastructure; Beaver River water-supply and irrigation infrastructure serving the Minersville area; Minersville–Big Wash Debris Dam and Minersville–Red Hills Debris Dam flood-control/debris-retention infrastructure; local streets, Utah State Route 21, Utah State Route 130, bridges, culverts, drainage channels, water lines, utility corridors, overhead and underground power and communications infrastructure, and access routes that may be affected by riverine flooding, flash flooding, stormwater ponding, debris flows, culvert overtopping, erosion, road washouts, utility disruption, or blocked emergency access.

Hail

Table 58 summarizes vulnerabilities and potential impacts associated with hail for Beaver County participants.

Table 58: Hail Vulnerability and Impact Assessment for Beaver County

Plan Participant	Vulnerabilities and Impacts
Beaver County	**Vulnerabilities:** Beaver County has moderate hail vulnerability driven by exposure of agricultural assets, scattered rural development, public facilities, and major transportation corridors. Documented hail events include a 1.25-inch hail event on July 29, 2021, and a 2.00-inch hail event on August 17, 2021, confirming exposure to damaging hail. Countywide planning context includes approximately 7,301 residents and 3,102 housing units; these totals are not estimates of direct hazard exposure. Other assets include 267 farms,

Plan Participant	Vulnerabilities and Impacts
	119,496 acres in farms, 26,787 irrigated acres, and more than 20,800 acres of forage production, along with structures, vehicles, utility infrastructure, and outdoor equipment across 2,582.9 square miles.[161] **Impacts:** Recent records indicate 2 NCEI hail records on 2 dates in Beaver County during 2021–2025, filtered to reported hail diameters of at least 1 inch, with $20,000 in reported property damage and no reported injuries, deaths, or crop damage. Hail can damage roofs, siding, windows, vehicles, solar and HVAC equipment, agricultural infrastructure, and forage production, while also creating hazardous travel conditions on Interstate 15, State Route 21, and other county roads. Even localized storms can create repair costs, temporary service disruption, and economic stress for rural households, producers, and public agencies.[162][163] **Critical Facilities and Critical Infrastructure Potentially Impacted:** Beaver County Administration Office; Beaver County Emergency Management; Beaver County Sheriff's Office, dispatch, Beaver County Jail, Search & Rescue, and other public safety facilities; Beaver Valley Hospital; Milford Memorial Hospital; Beaver County Road Department facilities, including the Beaver Road Shed and Milford Road Shed; county-maintained roads, bridges, culverts, traffic-control devices, signs, and access routes; county public buildings, parks/facilities, emergency shelters, schools, water and wastewater systems, electric power and communications infrastructure, fuel-distribution and emergency-service support infrastructure, agricultural facilities, livestock operations, and exposed vehicles, roofs, windows, mechanical systems, solar panels, communications equipment, and utility corridors that may be affected by hail impacts, roof and siding damage, broken windows, damaged vehicles/equipment, blocked access routes, or utility disruption.
Beaver City	**Vulnerabilities:** Homes, businesses, schools, vehicles, and public facilities in Beaver City are vulnerable to hail damage, particularly to roofs, siding, windows, and outdoor equipment. Because recent damaging hail has been documented in the Beaver area, Beaver City is exposed to localized hailstorms that can affect concentrated community assets with little warning. **Impacts:** Hail may result in property damage, maintenance and insurance costs, temporary service disruptions, and hazardous conditions for travel and outdoor activity. Localized hail can also affect public buildings, fleet vehicles, and surrounding agricultural assets that support the Beaver community.

[161] USDA National Agricultural Statistics Service, 2022 Census of Agriculture, Beaver County, Utah county profile, pp. 1–2 (267 farms; 119,496 acres in farms; 26,787 irrigated acres; 20,806 forage acres), https://www.nass.usda.gov/Publications/AgCensus/2022/Online_Resources/County_Profiles/Utah/cp49001.pdf. U.S. Census Bureau, QuickFacts: Beaver County, Utah; July 1, 2025 population and housing estimates (V2025), 2020 Census, and 2020–2024 American Community Survey, as applicable. Age percentages are those reported in QuickFacts, https://www.census.gov/quickfacts/fact/table/beavercountyutah/PST045225. Accessed October 10, 2026.

[162] HVAC = heating, ventilation, and air conditioning

[163] NOAA National Centers for Environmental Information, Storm Events Database, annual details CSV files, retrieved October 10, 2026, https://www.ncei.noaa.gov/pub/data/swdi/stormevents/csvfiles/, Beaver County hail, 2021–2025, diameters at least 1 inch: Events 974497 and 981963.

Plan Participant	Vulnerabilities and Impacts
	Critical Facilities and Critical Infrastructure Potentially Impacted: Beaver City Hall at 30 West 300 North; Beaver City Public Works water, sewer, streets, and infrastructure systems; Beaver City Water System, including water lines, meters, pumps, tanks, springs, wells, and service connections; Beaver City sewer system, including sewer lagoon and lift-station infrastructure; Beaver City Municipal Electric, including Lower Hydro 1, Middle Hydro 2, Upper Hydro 3, and related electric distribution infrastructure; Beaver City utility billing and administrative service functions; Beaver City Pool; Beaver Public Library; Tushar Mountain Ball Complex; Canyon Breeze Golf Course; Beaver Municipal Airport; Mountain View Cemetery; Beaver Fire District #1 Fire House and emergency response facilities; Beaver Valley Hospital; schools, parks, public buildings, local roads, bridges, culverts, traffic-control devices, signs, overhead electric and communications lines, utility corridors, exposed vehicles, roofs, windows, mechanical systems, and outdoor equipment within Beaver City that may be affected by hail impacts, roof and siding damage, broken windows, damaged vehicles/equipment, blocked access routes, or utility disruption.
City of Milford	**Vulnerabilities:** Milford is vulnerable to hail impacts on structures, vehicles, utilities, and nearby agricultural uses during severe weather events. The normal exposure of Milford Municipal Airport and surrounding valley development to convective storms means hail can affect both municipal assets and transportation-related facilities in and around the city. **Impacts:** Potential impacts include damage to roofs and exteriors, broken windows, damage to fleet or privately owned vehicles, crop loss, and short-term disruption to transportation and outdoor operations. Hail may also increase repair and maintenance costs for public facilities, utilities, and nearby agricultural producers. **Critical Facilities and Critical Infrastructure Potentially Impacted:** Milford City Offices/City Hall at 26 South 100 West; Milford City Administrative Office; Milford City water, sewer, and garbage utility systems; Milford Municipal Water System, including culinary water wells, storage tanks, meters, service connections, and distribution mains; Milford wastewater system and lift station infrastructure; Milford DMV/Justice Court; Beaver County Sheriff's Office–Milford facilities; Beaver County Milford Administration Office; Beaver County Fire District #2/Milford Fire Department facilities; Milford Memorial Hospital and Milford Ambulance Service; Milford Medical Clinic; Milford Public Library; Milford Senior Citizen's Center; Milford Swimming Pool; Milford High School and Milford Elementary/School facilities; Milford Municipal Airport–Ben and Judy Briscoe Field; Milford Cemetery; Rocky Mountain Power electric service infrastructure; Enbridge Gas Utah natural gas service infrastructure; local communications infrastructure; Main Street, State Route 257, local roads, bridges, culverts, traffic-control devices, signs, airport access roads, water and sewer lines, electric power and communications lines, utility corridors, exposed vehicles, roofs, windows, mechanical systems, outdoor equipment, and solar or communications equipment within Milford that may be affected

Plan Participant	Vulnerabilities and Impacts
	by hail impacts, roof and siding damage, broken windows, damaged vehicles/equipment, blocked access routes, or utility disruption.
Town of Minersville	**Vulnerabilities:** Minersville may be vulnerable where homes, vehicles, outdoor equipment, and nearby agricultural resources are exposed to hail-producing storms. As part of the county's irrigated and rural landscape, Minersville is also vulnerable to hail impacts on forage, farm structures, utility assets, and local roads. **Impacts:** Hail can cause property damage, affect crops and landscaping, damage vehicles and exposed equipment, and create cleanup and repair needs for residents and local government. Even short-duration storms may disrupt local travel, strain limited repair capacity, and increase costs for households and nearby agricultural operations. **Critical Facilities and Critical Infrastructure Potentially Impacted:** Minersville Town Office/Town Hall at 60 West Main Street; Minersville Town water utility system, including groundwater supply, water mains, meters, service connections, and related water service infrastructure; Minersville Fire Department/Beaver County Fire District #2 facility at 118 South Center Street; Minersville School facilities; Minersville public buildings, parks, community facilities, and local government service functions; Minersville Reservoir and associated irrigation, recreation, campground, boat ramp, dock, culinary water, restroom, shower, sewage disposal, fish-cleaning, electric hookup, and access infrastructure; Minersville Reservoir & Irrigation Company infrastructure; Beaver River water-supply and irrigation infrastructure serving the Minersville area; local streets, Utah State Route 21, Utah State Route 130, bridges, culverts, traffic-control devices, signs, water lines, utility corridors, overhead and underground power and communications infrastructure, exposed vehicles, roofs, windows, mechanical systems, outdoor equipment, and access routes that may be affected by hail impacts, roof and siding damage, broken windows, damaged vehicles/equipment, blocked access routes, or utility disruption.

Landslide

Table 59 summarizes vulnerabilities and potential impacts associated with landslide for Beaver County participants.

Table 59: Landslide Vulnerability and Impact Assessment for Beaver County

Plan Participant	Vulnerabilities and Impacts
Beaver County	**Vulnerabilities:** Beaver County has moderate landslide vulnerability concentrated in steep terrain, mountain transportation corridors, canyon systems, drainage crossings, and areas near the Tushar Mountains where rockfall, debris flow, and shallow slope failures may occur. Countywide

Plan Participant	Vulnerabilities and Impacts
	planning context includes 7,072 residents in 2020, an estimated 7,301 residents in 2025, approximately 2,518 households, and 3,102 housing units. These totals do not quantify landslide exposure; roads, bridges, and culverts are potentially affected where they intersect unstable slopes or debris-flow paths. Potentially affected lifelines include Interstate 15, State Routes 21 and 130, and State Route 153 through Beaver Canyon and the Tushar Mountains, local canyon roads, county B roads, co-located utility corridors, and recreation access routes. **Impacts:** Landslides can damage roads, bridges, culverts, utilities, campgrounds, recreation access points, and dispersed development, while restricting access and increasing erosion, drainage problems, and emergency response needs. Beaver County was included in FEMA Disaster Declaration DR-1598-UT for Flooding and Landslides in 2005, demonstrating documented regional exposure. Because communities and services depend on limited transportation and utility corridors across 2,582.9 square miles, even a localized slope failure can create disproportionate travel disruption, temporary isolation, detours, and service interruption. In July 2026, flash flooding and debris flows severely damaged or washed away sections of State Route 153 through Beaver Canyon. UDOT reported an indefinite closure on July 21 and began emergency repair work in August; its August 28 update stated that the west side would remain closed to general and recreational travel for the remainder of 2026. The event demonstrates the potential for post-fire runoff, channel erosion, and slope instability to disrupt mountain access and transportation infrastructure.[164] **Critical Facilities and Critical Infrastructure Potentially Impacted:** Beaver County Administration Office; Beaver County Emergency Management; Beaver County Sheriff's Office, dispatch, Beaver County Jail, Search & Rescue, and other public safety facilities; Beaver Valley Hospital; Milford Memorial Hospital; Beaver County Road Department facilities, including the Beaver Road Shed and Milford Road Shed; county-maintained roads, bridges, culverts, drainage facilities, canyon roads, slope-adjacent access routes, and rural transportation corridors; county public buildings, parks/facilities, emergency shelters, schools, water and wastewater systems, electric power, natural gas, communications, and fuel-distribution lifeline infrastructure; dams, reservoirs, irrigation conveyance systems, stream crossings, flood-control channels, and debris-retention structures, including Rocky Ford Dam/Minersville Reservoir, Kent's Lake dams, Manderfield (Beaver) Dam, Three Creeks Dam, Puffer Lake Dam, Anderson Meadow Dam, Labaron Dam, South Creek Dam, Blue Lake Dam, Little Reservoir Dam, Minersville–Big Wash Debris Dam, and Minersville–Red Hills Debris Dam that may be affected by

[164] Utah Department of Transportation, "SR-153 through Beaver Canyon closed indefinitely after flooding washes out road," July 21, 2026; "Emergency repair work begins on SR-153 in Beaver Canyon," August 28, 2026, https://connect.udot.utah.gov/2026/07/21/sr-153-through-beaver-canyon-closed-indefinitely-after-flooding-washes-out-road/; https://connect.udot.utah.gov/2026/08/28/emergency-repair-work-begins-on-sr-153-in-beaver-canyon/.

Plan Participant	Vulnerabilities and Impacts
	landslides, debris flows, rockfall, slope failure, erosion, road blockage, utility disruption, or loss of emergency access.[165]
Beaver City	**Vulnerabilities:** Beaver City may be vulnerable where nearby slopes, drainage channels, or transportation connections are susceptible to erosion, rockfall, debris movement, or unstable ground conditions. Although direct structural exposure is lower than in more urban counties, Beaver City depends on reliable access through surrounding terrain and local drainage crossings that may be affected by slope movement. **Impacts:** Potential impacts include damage to roads and drainage infrastructure, sediment deposition, temporary access limitations, and added maintenance and repair costs. Landslides or debris movement affecting nearby corridors could also delay emergency response, interrupt utilities, and reduce access to public services and recreation areas connected to Beaver City. **Critical Facilities and Critical Infrastructure Potentially Impacted:** Beaver City Hall at 30 West 300 North; Beaver City Public Works water, sewer, streets, and infrastructure systems; Beaver City Water System, including water lines, meters, pumps, tanks, springs, wells, and service connections; Beaver City sewer system, including sewer lagoon and lift-station infrastructure; Beaver City Municipal Electric, including Lower Hydro 1, Middle Hydro 2, Upper Hydro 3, Beaver River hydroelectric facilities, and related electric distribution infrastructure; Beaver City utility billing and administrative service functions; Beaver Senior Citizen Center; Beaver City Pool; Beaver Public Library; Tushar Mountain Ball Complex; Canyon Breeze Golf Course; Beaver Municipal Airport; Mountain View Cemetery; Beaver Fire District #1 Fire House and emergency response facilities; Beaver Valley Hospital; schools, parks, public buildings, local roads, bridges, culverts, drainage channels, Beaver River corridors, canyon access routes, water and sewer lines, electric power and communications lines, and utility corridors within Beaver City that may be affected by landslides, debris flows, rockfall, slope failure, erosion, road blockage, utility disruption, or loss of emergency access.
City of Milford	**Vulnerabilities:** Milford has lower overall landslide exposure than the county's mountainous eastern areas, but transportation routes, drainage channels, fill embankments, and localized slopes may still be vulnerable to erosion and slope movement. Milford may also experience indirect vulnerability where access, utilities, or regional corridors serving the community are affected by landslides elsewhere in Beaver County. **Impacts:** Localized slope failure or debris movement could affect roads, drainage systems, and nearby infrastructure, leading to cleanup, repair, and

[165] Utah Division of Water Rights, National Inventory of Dams list: LABARON (UT00167) and KENT'S LAKE NO. 1 and NO. 2 (UT00161–UT00162). https://www.waterrights.utah.gov/damsafety/nid_list. U.S. Forest Service, LeBaron Campground and Kents Lake Road naming. https://www.fs.usda.gov/r04/fishlake/recreation/lebaron-campground; https://www.fs.usda.gov/recarea/fishlake/recreation/wateractivities/recarea/?recid=12192&actid=42. Dam inventory names are retained for dams; lake names follow Forest Service usage.

Plan Participant	Vulnerabilities and Impacts
	temporary disruption. Landslide impacts along transportation or utility routes outside the city may also affect travel, service access, and response capacity in and around Milford. **Critical Facilities and Critical Infrastructure Potentially Impacted:** Milford City Offices/City Hall at 26 South 100 West; Milford City Administrative Office; Milford City water, sewer, and garbage utility systems; Milford Municipal Water System, including culinary water wells, storage tanks, meters, service connections, and distribution mains; Milford wastewater system and lift station infrastructure; Milford DMV/Justice Court; Beaver County Sheriff's Office–Milford facilities; Beaver County Milford Administration Office; Beaver County Fire District #2/Milford Fire Department facilities; Milford Memorial Hospital and Milford Ambulance Service; Milford Medical Clinic; Milford Public Library; Milford Senior Citizen's Center; Milford Swimming Pool; Milford High School and Milford Elementary/School facilities; Milford Municipal Airport–Ben and Judy Briscoe Field; Milford Cemetery; Rocky Mountain Power electric service infrastructure; Enbridge Gas Utah natural gas service infrastructure; local communications infrastructure; Main Street, State Route 257, local roads, bridges, culverts, drainage corridors, rail access, airport access roads, water and sewer lines, electric power and communications lines, and utility corridors within Milford that may be affected by landslides, debris flows, rockfall, slope failure, erosion, road blockage, utility disruption, or loss of emergency access.
Town of Minersville	**Vulnerabilities:** Minersville may be vulnerable where roads, utility corridors, drainage crossings, or structures are affected by erosion, unstable ground, or nearby slope conditions. The town also depends on transportation and service routes that may traverse landslide-prone terrain elsewhere in Beaver County, increasing indirect vulnerability even where direct exposure is localized. **Impacts:** Landslide-related impacts could include roadway blockage, infrastructure damage, sediment accumulation, drainage problems, and increased maintenance or emergency access concerns. Even moderate slope failures affecting nearby corridors may isolate portions of the community, delay services, and increase repair demands for local government and residents. **Critical Facilities and Critical Infrastructure Potentially Impacted:** Minersville Town Office/Town Hall at 60 West Main Street; Minersville Town water utility system, including groundwater supply, water mains, meters, service connections, and related water service infrastructure; Minersville Fire Department/Beaver County Fire District #2 facility at 118 South Center Street; Minersville School facilities; Minersville public buildings, parks, community facilities, and local government service functions; Minersville Reservoir and associated irrigation, recreation, campground, boat ramp, dock, culinary water, restroom, shower, sewage disposal, fish-cleaning, electric hookup, and access infrastructure; Minersville Reservoir & Irrigation Company infrastructure; Beaver River water-supply and irrigation infrastructure serving the Minersville area; Minersville–Big Wash Debris Dam and Minersville–Red Hills Debris Dam flood-control/debris-retention infrastructure; local streets,

Plan Participant	Vulnerabilities and Impacts
	Utah State Route 21, Utah State Route 130, bridges, culverts, drainage channels, water lines, utility corridors, overhead and underground power and communications infrastructure, and access routes that may be affected by landslides, debris flows, rockfall, slope failure, erosion, road blockage, utility disruption, or loss of emergency access.

Problem Soils

Table 60 summarizes vulnerabilities and potential impacts associated with problem soils for Beaver County participants.

Table 60: Problem Soils Vulnerability and Impact Assessment for Beaver County

Plan Participant	Vulnerabilities and Impacts
Beaver County	**Vulnerabilities:** Beaver County's problem soil vulnerability is concentrated in valley bottoms, alluvial settings, and agricultural areas where saline, sodic, collapsible, shallow, and locally expansive soils affect development and infrastructure. Countywide context includes 7,301 residents and 3,102 housing units in 2025 and, in the 2022 Census of Agriculture, 267 farms, 119,496 acres in farms, and 26,787 irrigated acres. These totals do not identify assets on hazardous soils. Potentially affected assets include local roads, culverts, bridges and approaches, water and wastewater lines, septic systems, canals, laterals, and agricultural support facilities in Beaver Valley, Milford Valley, Minersville, and other valley-floor settings. **Impacts:** Problem soils can contribute to foundation cracking, slab movement, uneven floors, pavement distress, shoulder failure, pipe breaks, septic limitations, drainage problems, canal and lateral damage, and increased construction and maintenance costs over time. Because homes, public buildings, agricultural facilities, roads, buried utilities, and critical services are often concentrated in the same valley areas where soil limitations occur, even localized failures can create disproportionate service disruption and recurring repair costs in rural parts of the county. **Critical Facilities and Critical Infrastructure Potentially Impacted:** Beaver County Administration Office; Beaver County Emergency Management; Beaver County Sheriff's Office, dispatch, Beaver County Jail, Search & Rescue, and other public safety facilities; Beaver High School; Beaver Valley Hospital; Milford Memorial Hospital; Beaver Municipal Airport; Beaver County Road Department facilities, including the Beaver Road Shed and Milford Road Shed; county-maintained roads, bridges, culverts, drainage facilities, and access routes; county public buildings, parks/facilities, emergency shelters, schools, water and wastewater systems, electric power, natural gas, communications, and fuel-distribution lifeline infrastructure; dams, reservoirs, irrigation conveyance systems, stream crossings, flood-control channels, and debris-retention structures, including Rocky Ford Dam/Minersville Reservoir, Kent's

Plan Participant	Vulnerabilities and Impacts
	Lake dams, Manderfield (Beaver) Dam, Three Creeks Dam, Puffer Lake Dam, Anderson Meadow Dam, Labaron Dam, South Creek Dam, Blue Lake Dam, Little Reservoir Dam, Minersville–Big Wash Debris Dam, and Minersville–Red Hills Debris Dam that may be affected by expansive soils, collapsible soils, corrosive soil or rock, soluble soil or rock, piping and erosion, shallow bedrock, wind-blown sand, settlement, foundation movement, pavement cracking, buried utility damage, drainage failure, or increased maintenance needs.[166]
Beaver City	**Vulnerabilities:** Beaver City is vulnerable where homes, public buildings, streets, sidewalks, and underground utilities are located on valley-floor or alluvial soils with saline, collapsible, shallow, or localized shrink-swell characteristics. Moisture introduced by irrigation, stormwater, or leaking utilities can increase settlement, heave, and long-term infrastructure stress in developed portions of the city. **Impacts:** Problem soils may damage foundations, pavements, sidewalks, and buried utilities, increase repair needs, and complicate future development and infrastructure maintenance. Soil-related failures can also affect drainage, septic performance, and service reliability for homes, public buildings, and local transportation assets. **Critical Facilities and Critical Infrastructure Potentially Impacted:** Beaver City Hall at 30 West 300 North; Beaver City Public Works water, sewer, streets, and infrastructure systems; Beaver City Water System, including water lines, meters, pumps, tanks, springs, wells, and service connections; Beaver City sewer system, including sewer lagoon, lift-station infrastructure, and planned sewer system improvements; Beaver City Municipal Electric, including Lower Hydro 1, Middle Hydro 2, Upper Hydro 3, 46 kV meter structure, Beaver River hydroelectric facilities, and related electric distribution infrastructure; Beaver City utility billing and administrative service functions; Beaver City Pool; Beaver Public Library; Tushar Mountain Ball Complex; Canyon Breeze Golf Course; Beaver Municipal Airport; Mountain View Cemetery; Beaver Fire District #1 Fire House and emergency response facilities; Beaver Valley Hospital; schools, parks, public buildings, local roads, bridges, culverts, drainage channels, Beaver River corridors, sidewalks, water and sewer lines, electric power and communications lines, buried utilities, foundations, pavements, and utility corridors within Beaver City that may be affected by expansive soils, collapsible soils, corrosive soil or rock, soluble soil or rock, piping and erosion, shallow bedrock, wind-blown sand, settlement, foundation movement, pavement cracking, buried utility damage, drainage failure, or increased maintenance needs.

[166] Utah Division of Water Rights, National Inventory of Dams list: LABARON (UT00167) and KENT'S LAKE NO. 1 and NO. 2 (UT00161–UT00162). https://www.waterrights.utah.gov/damsafety/nid_list. U.S. Forest Service, LeBaron Campground and Kents Lake Road naming. https://www.fs.usda.gov/r04/fishlake/recreation/lebaron-campground ; https://www.fs.usda.gov/recarea/fishlake/recreation/wateractivities/recarea/?recid=12192&actid=42. Dam inventory names are retained for dams; lake names follow Forest Service usage.

Plan Participant	Vulnerabilities and Impacts
City of Milford	**Vulnerabilities:** Milford may be vulnerable to soil-related issues affecting buildings, roads, drainage, and buried infrastructure where valley soils are saline, weak, collapsible, or otherwise moisture-sensitive. Because Milford is located within a developed valley setting, roads, utility lines, and agricultural-support infrastructure may be affected where irrigation, stormwater, or fluctuating moisture conditions activate soil movement or corrosive conditions. **Impacts:** Potential impacts include structural settlement, pavement deterioration, damage to buried utilities, drainage issues, and higher long-term maintenance costs. Problem soils may also affect surrounding agricultural and service infrastructure that supports the Milford community, increasing repair needs and operational costs over time. **Critical Facilities and Critical Infrastructure Potentially Impacted:** Milford City Offices/City Hall at 26 South 100 West; Milford City Administrative Office; Milford City water, sewer, and garbage utility systems; Milford Municipal Water System, including groundwater wells, storage tanks, meters, service connections, and distribution mains; Milford wastewater system, including the Little League Lift Station/Town Lift Station, Industrial Park Lift Station, sewer lagoon cells, headworks and metering station, interceptor sewer, clay pipe segments, force mains, gravity sewer, backup generators, and related sewer collection infrastructure; Milford DMV/Justice Court; Beaver County Sheriff's Office–Milford facilities; Beaver County Milford Administration Office; Beaver County Fire District #2/Milford Fire Department facilities; Milford Memorial Hospital and Milford Ambulance Service; Milford Medical Clinic; Milford Public Library; Milford Senior Citizen's Center; Milford Swimming Pool; Milford High School and Milford Elementary/School facilities; Milford Municipal Airport–Ben and Judy Briscoe Field; Milford Cemetery; Rocky Mountain Power electric service infrastructure; Enbridge Gas Utah natural gas service infrastructure; local communications infrastructure; Main Street, State Route 257, local roads, bridges, culverts, sidewalks, drainage corridors, airport access roads, water and sewer lines, buried utilities, foundations, pavements, and utility corridors within Milford that may be affected by expansive soils, collapsible soils, corrosive soil or rock, soluble soil or rock, piping and erosion, shallow bedrock, wind-blown sand, settlement, foundation movement, pavement cracking, buried utility damage, drainage failure, or increased maintenance needs.
Town of Minersville	**Vulnerabilities:** Minersville is vulnerable where homes, local roads, drainage features, buried utilities, and nearby agricultural support facilities are founded on shrinking, swelling, collapsible, saline, or otherwise unstable soils. As part of the county's valley-floor and agricultural landscape, the town may also be affected where irrigation, leaking infrastructure, or runoff introduces moisture into sensitive soil conditions. **Impacts:** Problem soils can lead to foundation damage, roadway deterioration, utility issues, septic or drainage limitations, and added costs for construction, repair, and maintenance. Even localized soil failures may create

Plan Participant	Vulnerabilities and Impacts
	recurring infrastructure problems and increase operating costs for residents, local government, and nearby agricultural operations. **Critical Facilities and Critical Infrastructure Potentially Impacted:** Minersville Town Office/Town Hall at 60 West Main Street; Minersville Town water utility system, including groundwater supply, water mains, meters, service connections, and related water service infrastructure; Minersville Fire Department/Beaver County Fire District #2 facility at 118 South Center Street; Minersville School facilities; Minersville public buildings, town library, parks, community facilities, and local government service functions; Minersville Reservoir and associated irrigation, recreation, campground, boat ramp, dock, culinary water, restroom, shower, sewage disposal, fish-cleaning, electric hookup, and access infrastructure; Minersville Reservoir & Irrigation Company infrastructure; Beaver River water-supply and irrigation infrastructure serving the Minersville area; Minersville–Big Wash Debris Dam and Minersville–Red Hills Debris Dam flood-control/debris-retention infrastructure; local streets, Utah State Route 21, Utah State Route 130, bridges, culverts, drainage channels, water lines, buried utilities, foundations, pavements, utility corridors, overhead and underground power and communications infrastructure, and access routes that may be affected by expansive soils, collapsible soils, corrosive soil or rock, soluble soil or rock, piping and erosion, shallow bedrock, wind-blown sand, settlement, foundation movement, pavement cracking, buried utility damage, drainage failure, or increased maintenance needs.

Radon Gas

Table 61 summarizes vulnerabilities and potential impacts associated with radon gas for Beaver County participants.

Table 61: Radon Gas Vulnerability and Impact Assessment for Beaver County

Plan Participant	Vulnerabilities and Impacts
Beaver County	**Vulnerabilities:** Beaver County is classified by the U.S. Environmental Protection Agency (EPA) as a Zone 2 county, meaning the predicted average indoor screening level is between 2 and 4 pCi/L, and the 2024 Utah Enhanced State Hazard Mitigation Plan ranks Beaver County's radon hazard significance as moderate. Homes, schools, workplaces, and other enclosed buildings in Beaver County may be vulnerable where local geology allows naturally

Plan Participant	Vulnerabilities and Impacts
	occurring gas to accumulate indoors, including a housing stock of 3,102 units and public facilities serving dispersed rural communities.[167][168] **Impacts:** Elevated radon poses a long-term public health risk, particularly where buildings are not tested or mitigated. The EPA recommends mitigation at or above 4 pCi/L. Beaver County may therefore face ongoing needs for testing, education, mitigation, and follow-up action in residences and occupied public buildings. **Critical Facilities, Critical Infrastructure, and Vulnerable Populations Potentially Impacted:** Beaver County Administration Office; Beaver County Emergency Management; Beaver County Sheriff's Office, dispatch, Beaver County Jail, Search & Rescue, and other public safety facilities; Beaver Valley Hospital; Milford Memorial Hospital; county public buildings, justice court facilities, emergency shelters, schools, libraries, senior/community facilities, road department offices and crew facilities, and other regularly occupied county-owned or county-supported buildings where indoor radon accumulation could affect employees, patients, students, residents, responders, visitors, or other building occupants; occupied water, wastewater, utility, communications, and emergency-service support facilities that may require radon testing, ventilation improvements, sealing, or mitigation where elevated indoor radon levels are identified.
Beaver City	**Vulnerabilities:** Beaver City may be vulnerable where homes and public buildings are not regularly tested for radon or where direct ground contact, basements, crawlspaces, slab-on-grade construction, foundation cracks, or limited ventilation allow indoor gas accumulation. Beaver County's EPA Zone 2 designation does not determine indoor radon levels in Beaver City; individual-building testing is necessary. **Impacts:** Potential impacts are primarily long-term health related and may increase the need for testing, public outreach, and mitigation in affected structures. Elevated radon in homes, schools, or public buildings could also create household and municipal costs for mitigation and follow-up testing. **Critical Facilities, Critical Infrastructure, and Vulnerable Populations Potentially Impacted:** Beaver City Hall at 30 West 300 North; Beaver City Public Works offices and occupied water, sewer, streets, and infrastructure support facilities; Beaver City utility billing and administrative service functions; Beaver City Pool; Beaver Public Library; Tushar Mountain Ball Complex support buildings; Canyon Breeze Golf Course clubhouse/support buildings; Beaver Municipal Airport occupied buildings; Beaver Fire District #1 Fire House and emergency response facilities; Beaver Valley Hospital; schools, public buildings, parks and recreation buildings, community facilities, occupied utility facilities, and other regularly occupied municipal or

[167] pCi/L = picocuries per liter

[168] U.S. Environmental Protection Agency, Utah Map of Radon Zones (map developed in 1993). https://www.epa.gov/sites/default/files/2014-08/documents/utah.pdf. County zones do not predict individual-building levels; all homes should be tested.

Plan Participant	Vulnerabilities and Impacts
	community buildings within Beaver City where indoor radon accumulation could affect employees, patients, students, residents, responders, visitors, or other building occupants and may require radon testing, ventilation improvements, sealing, or mitigation where elevated indoor radon levels are identified.
City of Milford	**Vulnerabilities:** Milford is vulnerable where residential and public buildings may have elevated indoor radon concentrations due to local geologic conditions, direct ground contact, and limited testing awareness. As part of EPA Radon Zone 2, Milford may contain buildings with moderate to elevated indoor radon potential even where no visible site indicator is present. **Impacts:** Radon exposure may affect long-term health and could require increased education, testing, and mitigation measures for buildings with elevated levels. Public facilities, residences, and rental properties may also face added costs and operational burdens if testing identifies radon above recommended action levels. **Critical Facilities, Critical Infrastructure, and Vulnerable Populations Potentially Impacted:** Milford City Offices/City Hall at 26 South 100 West; Milford City Administrative Office; Milford DMV/Justice Court; Beaver County Sheriff's Office–Milford facilities; Beaver County Milford Administration Office; Beaver County Fire District #2/Milford Fire Department facilities; Milford Memorial Hospital and Milford Ambulance Service; Milford Medical Clinic; Milford Public Library; Milford Senior Citizen's Center; Milford Swimming Pool; Milford High School and Milford Elementary/School facilities; Milford Municipal Airport–Ben and Judy Briscoe Field occupied buildings; Milford Cemetery occupied support buildings; occupied water, wastewater, utility, communications, and emergency-service support facilities; public buildings, schools, healthcare facilities, emergency shelters, community facilities, and other regularly occupied municipal or community buildings within Milford where indoor radon accumulation could affect employees, patients, students, residents, responders, visitors, or other building occupants and may require radon testing, ventilation improvements, sealing, or mitigation where elevated indoor radon levels are identified.
Town of Minersville	**Vulnerabilities:** Minersville may be vulnerable where homes and community buildings are exposed to naturally occurring radon and testing or mitigation is limited. As part of Beaver County's EPA Zone 2 radon setting, Minersville may include ground-contact structures where indoor radon accumulates in basements, crawlspaces, or slab-on-grade buildings without obvious warning signs. **Impacts:** Impacts are primarily associated with long-term indoor exposure and may require public education, building testing, and mitigation improvements. Elevated radon could also create financial and operational burdens for households and local facilities if mitigation is needed. **Critical Facilities, Critical Infrastructure, and Vulnerable Populations Potentially Impacted:** Minersville Town Office/Town Hall at 60 West Main

Plan Participant	Vulnerabilities and Impacts
	Street; Minersville Town water utility offices and occupied water service support facilities; Minersville Fire Department/Beaver County Fire District #2 facility at 118 South Center Street; Minersville School facilities; Minersville public buildings, parks and recreation support buildings, community facilities, local government service offices, Minersville Reservoir occupied recreation/support buildings, and other regularly occupied municipal or community buildings within Minersville where indoor radon accumulation could affect employees, students, residents, responders, visitors, or other building occupants and may require radon testing, ventilation improvements, sealing, or mitigation where elevated indoor radon levels are identified.

Thunderstorms and Lightning

Table 62 summarizes vulnerabilities and potential impacts associated with thunderstorms and lightning for Beaver County participants.

Table 62: Thunderstorms and Lightning Vulnerability and Impact Assessment for Beaver County

Plan Participant	Vulnerabilities and Impacts
Beaver County	**Vulnerabilities:** Beaver County has a moderate but recurring vulnerability to thunderstorms and lightning because seasonal convective storms affect dispersed rural communities, agricultural operations, transportation routes, utility infrastructure, and recreation areas across a large geographic area. Open terrain, exposed highways, long utility corridors, and above-ground electrical distribution systems increase vulnerability to cloud-to-ground lightning, gusty outflow winds, brief heavy rainfall, and associated service disruption. **Impacts:** A documented July 2016 thunderstorm near Milford downed 16 power poles, caused about $20,000 in property damage, and interrupted power to nearly the entire community, illustrating the potential for localized storms to create disproportionate countywide disruption. Thunderstorms and lightning can also cause wildfire starts, power outages, hazardous travel, equipment damage, agricultural losses, communications disruption, and risk to outdoor workers and recreationists along Interstate 15 and State Routes 21, 130, 153, 160, and 257. **Critical Facilities and Critical Infrastructure Potentially Impacted:** Beaver County Administration Office; Beaver County Emergency Management; Beaver County Sheriff's Office, Beaver County Sheriff's Dispatch, Beaver County Jail, Search & Rescue, and other public safety facilities; Beaver Valley Hospital; Milford Memorial Hospital; Beaver County Road Department facilities, including the Beaver Road Shed at 1616 North Highway 357 and Milford Road Shed at 899 South Highway 21; county-maintained roads, bridges, culverts, traffic-control devices, signs, drainage facilities, and access routes; county public buildings, parks/facilities, emergency shelters, schools, water and

Plan Participant	Vulnerabilities and Impacts
	wastewater systems, electric power, natural gas, communications, emergency alert/dispatch systems, fuel-distribution and emergency-service support infrastructure, agricultural facilities, livestock operations, exposed vehicles/equipment, rooftops, mechanical systems, antennas, radio towers, utility poles, overhead lines, and utility corridors that may be affected by lightning strikes, power surges, fire ignition, wind-driven rain, localized flooding, hail, downed lines, blocked roads, or service disruptions.
Beaver City	**Vulnerabilities:** Beaver City is vulnerable to thunderstorms and lightning where homes, businesses, utilities, drainage systems, transportation routes, and outdoor activities are exposed to severe weather. Local exposure is increased by above-ground utilities, open terrain, and the city's reliance on surrounding transportation and service corridors that may be affected by strong winds, heavy rain, or lightning. **Impacts:** Potential impacts include utility interruption, minor property damage, localized flooding, lightning-related fire starts, and threats to public safety during storm events. Even isolated storms may disrupt roads, communications, and public services while affecting residents, businesses, and outdoor recreation or work activities. **Critical Facilities and Critical Infrastructure Potentially Impacted:** Beaver City Hall at 30 West 300 North; Beaver City Public Works water, sewer, streets, and infrastructure systems; Beaver City Water System, including water lines, meters, pumps, tanks, springs, wells, and service connections; Beaver City sewer system, including sewer lagoon and lift-station infrastructure; Beaver City Municipal Electric, including Lower Hydro 1, Middle Hydro 2, Upper Hydro 3, Beaver River hydroelectric facilities, 46 kV meter structure, overhead electric lines, utility poles, transformers, meters, and related electric distribution infrastructure; Beaver City utility billing and administrative service functions; Beaver City Pool; Beaver Public Library; Tushar Mountain Ball Complex; Canyon Breeze Golf Course; Beaver Municipal Airport; Mountain View Cemetery; Beaver Fire District #1 Fire House and emergency response facilities; Beaver Valley Hospital; schools, parks, public buildings, local roads, bridges, culverts, traffic-control devices, signs, drainage channels, water and sewer lines, electric power and communications lines, antennas, radio/communications equipment, exposed vehicles/equipment, rooftops, mechanical systems, and utility corridors within Beaver City that may be affected by lightning strikes, power surges, fire ignition, wind-driven rain, localized flooding, hail, downed lines, blocked roads, or service disruptions.
City of Milford	**Vulnerabilities:** Milford is vulnerable to lightning strikes, heavy rain, thunderstorm winds, and utility disruption affecting structures, roads, open land, and transportation or industrial facilities. Historical evidence shows this exposure directly: a July 2016 thunderstorm near Milford downed 16 power poles and caused a widespread outage affecting nearly all local residents. **Impacts:** Thunderstorms may produce outages, hazardous driving conditions, localized drainage problems, minor structural damage, and fire ignition risk. Severe localized events can also interrupt public services, damage utility

Plan Participant	Vulnerabilities and Impacts
	infrastructure, and create cleanup and recovery demands that are significant for a small community. **Critical Facilities and Critical Infrastructure Potentially Impacted:** Milford City Offices/City Hall at 26 South 100 West; Milford City Administrative Office; Milford City water, sewer, and garbage utility systems; Milford Municipal Water System, including culinary water wells, storage tanks, meters, service connections, and distribution mains; Milford wastewater system and lift station infrastructure; Milford DMV/Justice Court; Beaver County Sheriff's Office–Milford facilities; Beaver County Milford Administration Office; Beaver County Fire District #2/Milford Fire Department facilities; Milford Memorial Hospital and Milford Ambulance Service; Milford Medical Clinic; Milford Public Library; Milford Senior Citizen's Center; Milford Swimming Pool; Milford High School and Milford Elementary/School facilities; Milford Municipal Airport–Ben and Judy Briscoe Field; Milford Cemetery; Rocky Mountain Power electric service infrastructure; Enbridge Gas Utah natural gas service infrastructure; local communications infrastructure; Main Street, State Route 257, local roads, bridges, culverts, traffic-control devices, signs, drainage corridors, airport access roads, water and sewer lines, electric power and communications lines, antennas, radio/communications equipment, exposed vehicles/equipment, rooftops, mechanical systems, utility poles, overhead lines, and utility corridors within Milford that may be affected by lightning strikes, power surges, fire ignition, wind-driven rain, localized flooding, hail, downed lines, blocked roads, or service disruptions.
Town of Minersville	**Vulnerabilities:** Minersville may be vulnerable where residents, local infrastructure, agricultural support facilities, and open lands are exposed to lightning, gusty winds, brief heavy rainfall, and severe storm conditions. The town's rural setting and dependence on exposed utility and transportation links increase vulnerability to localized storm disruption. **Impacts:** Impacts can include lightning-caused fires, outages, minor flooding, property damage, and increased emergency response needs during storms. Even short-duration thunderstorms may disrupt access, affect utilities, and create repair and cleanup demands for residents, local government, and nearby agricultural operations.

Plan Participant	Vulnerabilities and Impacts
	Critical Facilities and Critical Infrastructure Potentially Impacted: Minersville Town Office/Town Hall at 60 West Main Street; Minersville Town water utility system, including groundwater supply, water mains, meters, service connections, and related water service infrastructure; Minersville Fire Department/Beaver County Fire District #2 facility at 118 South Center Street; Minersville School facilities; Minersville public buildings, parks, community facilities, and local government service functions; Minersville Reservoir and associated irrigation, recreation, campground, boat ramp, dock, culinary water, restroom, shower, sewage disposal, fish-cleaning, electric hookup, and access infrastructure; Minersville Reservoir & Irrigation Company infrastructure; Beaver River water-supply and irrigation infrastructure serving the Minersville area; local streets, Utah State Route 21, Utah State Route 130, bridges, culverts, traffic-control devices, signs, drainage channels, water lines, utility corridors, overhead and underground power and communications infrastructure, antennas, radio/communications equipment, exposed vehicles/equipment, rooftops, mechanical systems, utility poles, overhead lines, and access routes that may be affected by lightning strikes, power surges, fire ignition, wind-driven rain, localized flooding, hail, downed lines, blocked roads, or service disruptions.

Tornadoes

Table 63 summarizes tornado vulnerabilities and potential impacts for Beaver County participants.

Table 63: Tornadoes Vulnerability and Impact Assessment for Beaver County

Plan Participant	Vulnerabilities and Impacts
Beaver County	**Vulnerabilities:** Beaver County has low overall tornado probability but meaningful localized vulnerability where people, housing, schools, agricultural facilities, and lifeline systems are concentrated. Historical records indicate an EF0 tornado near Newhouse in August 2012, and countywide planning context includes approximately 7,301 residents, 3,102 housing units, and 2,518 households; these totals are not estimates of direct tornado exposure. Vulnerable populations include 28.1% of residents under age 18, 17.5% age 65 or older, and 11.3% of residents under age 65 with a disability. Potentially affected assets include public schools, fire stations in Beaver, Milford, and Minersville, Beaver Valley Hospital, Milford Memorial Hospital, agricultural buildings, and lifeline infrastructure along Interstate 15 and major local connectors.[169] **Impacts:** Even EF0 to EF2 tornadoes can cause highly localized but significant damage to roofs, siding, windows, outbuildings, irrigation systems, utility

[169] U.S. Census Bureau, QuickFacts: Beaver County, Utah, age and disability statistics. https://www.census.gov/quickfacts/fact/table/beavercountyutah/RHI125225. Accessed October 9, 2026.

Plan Participant	Vulnerabilities and Impacts
	poles, vehicles, and communications equipment, while creating debris hazards and short-term disruption to power, transportation, and emergency services. In a rural county with dispersed assets and limited redundancy, a single tornado path could affect a meaningful share of residents, homes, schools, medical services, and agricultural operations where development and critical facilities are concentrated. **Critical Facilities and Critical Infrastructure Potentially Impacted:** Beaver County Administration Office; Beaver County Emergency Management; Beaver County Sheriff's Office, Beaver County Sheriff's Dispatch, Beaver County Jail, Search & Rescue, Animal Control, and other public safety facilities; Beaver Valley Hospital; Milford Memorial Hospital; Beaver County Road Department facilities, including the Beaver Road Shed at 1616 North Highway 357 and Milford Road Shed at 899 South Highway 21; county-maintained roads, bridges, culverts, traffic-control devices, signs, drainage facilities, and access routes; county public buildings, parks/facilities, emergency shelters, schools, water and wastewater systems, electric power, natural gas, communications, emergency alert/dispatch systems, fuel-distribution and emergency-service support infrastructure, agricultural facilities, livestock operations, exposed vehicles/equipment, rooftops, mechanical systems, antennas, radio towers, utility poles, overhead lines, and utility corridors that may be affected by tornado winds, windborne debris, roof or structural damage, downed power and communications lines, blocked roads, utility disruption, or loss of emergency access.
Beaver City	**Vulnerabilities:** Beaver City is vulnerable to localized tornado impacts on homes, schools, public buildings, vehicles, and utilities if a severe thunderstorm produces tornadic winds. Concentrated development, older structures, manufactured housing, and reliance on local utility and transportation systems can increase exposure where a tornado path intersects the city. **Impacts:** Potential impacts include concentrated structural damage, debris, outages, injuries, and temporary loss of access to affected areas. Even a brief tornado could disrupt schools, city services, and emergency response while creating cleanup and recovery needs that exceed routine local capacity.

Plan Participant	Vulnerabilities and Impacts
	Critical Facilities and Critical Infrastructure Potentially Impacted: Beaver City Hall at 30 West 300 North; Beaver City Public Works water, sewer, streets, and infrastructure systems; Beaver City Water System, including water lines, meters, pumps, tanks, springs, wells, and service connections; Beaver City sewer system, including sewer lagoon and lift-station infrastructure; Beaver City Municipal Electric, including Lower Hydro 1, Middle Hydro 2, Upper Hydro 3, Beaver River hydroelectric facilities, 46 kV meter structure, overhead electric lines, utility poles, transformers, meters, and related electric distribution infrastructure; Beaver City utility billing and administrative service functions; Beaver City Pool; Beaver Public Library; Tushar Mountain Ball Complex; Canyon Breeze Golf Course; Beaver Municipal Airport; Mountain View Cemetery; Beaver Fire District #1 Fire House and emergency response facilities; Beaver Valley Hospital; schools, parks, public buildings, local roads, bridges, culverts, traffic-control devices, signs, drainage channels, water and sewer lines, electric power and communications lines, antennas, radio/communications equipment, exposed vehicles/equipment, rooftops, mechanical systems, utility poles, overhead lines, and utility corridors within Beaver City that may be affected by tornado winds, windborne debris, roof or structural damage, downed power and communications lines, blocked roads, utility disruption, or loss of emergency access.
City of Milford	**Vulnerabilities:** Milford may be vulnerable to isolated tornado damage affecting residences, civic buildings, utilities, vehicles, and open areas during severe storm events. Local exposure may be increased by manufactured housing, large-span buildings, agricultural support facilities, and the community's reliance on exposed utility and transportation links. **Impacts:** Even a brief tornado could cause concentrated property damage, service disruption, debris blockage, and localized emergency response and cleanup needs. A localized event may also interrupt utilities, affect access to community facilities, and strain small-community recovery capacity.

Plan Participant	Vulnerabilities and Impacts
	Critical Facilities and Critical Infrastructure Potentially Impacted: Milford City Offices/City Hall at 26 South 100 West; Milford City Administrative Office; Milford City water, sewer, and garbage utility systems; Milford Municipal Water System, including culinary water wells, storage tanks, meters, service connections, and distribution mains; Milford wastewater system and lift station infrastructure; Milford DMV/Justice Court; Beaver County Sheriff's Office–Milford facilities; Beaver County Milford Administration Office; Beaver County Fire District #2/Milford Fire Department facilities; Milford Memorial Hospital and Milford Ambulance Service; Milford Medical Clinic; Milford Public Library; Milford Senior Citizen's Center; Milford Swimming Pool; Milford High School and Milford Elementary/School facilities; Milford Municipal Airport–Ben and Judy Briscoe Field; Milford Cemetery; Rocky Mountain Power electric service infrastructure; Enbridge Gas Utah natural gas service infrastructure; local communications infrastructure; Main Street, State Route 257, local roads, bridges, culverts, traffic-control devices, signs, drainage corridors, airport access roads, water and sewer lines, electric power and communications lines, antennas, radio/communications equipment, exposed vehicles/equipment, rooftops, mechanical systems, utility poles, overhead lines, and utility corridors within Milford that may be affected by tornado winds, windborne debris, roof or structural damage, downed power and communications lines, blocked roads, utility disruption, or loss of emergency access.
Town of Minersville	**Vulnerabilities:** Minersville is vulnerable to rare tornado events where homes, town facilities, agricultural buildings, and exposed utilities are susceptible to localized extreme wind damage. The town's rural setting, older structures, manufactured housing, and limited shelter and service redundancy can increase vulnerability if a tornado affects the community. **Impacts:** Tornado impacts could include severe but localized structural damage, debris, outages, agricultural losses, and recovery demands that exceed local capacity. Even a short-duration event could disrupt roads, utilities, and emergency access while increasing cleanup, temporary shelter, and repair needs. **Critical Facilities and Critical Infrastructure Potentially Impacted:** Minersville Town Office/Town Hall at 60 West Main Street; Minersville Town water utility system, including groundwater supply, water mains, meters, service connections, and related water service infrastructure; Minersville Fire Department/Beaver County Fire District #2 facility at 118 South Center Street; Minersville School facilities; Minersville public buildings, parks, community facilities, and local government service functions; Minersville Reservoir and associated irrigation, recreation, campground, boat ramp, dock, culinary water, restroom, shower, sewage disposal, fish-cleaning, electric hookup, and access infrastructure; Minersville Reservoir & Irrigation Company infrastructure; Beaver River water-supply and irrigation infrastructure serving the Minersville area; local streets, Utah State Route 21, Utah State Route 130, bridges, culverts, traffic-control devices, signs, drainage channels, water lines, utility corridors, overhead and underground power and communications

Plan Participant	Vulnerabilities and Impacts
	infrastructure, antennas, radio/communications equipment, exposed vehicles/equipment, rooftops, mechanical systems, utility poles, overhead lines, and access routes that may be affected by tornado winds, windborne debris, roof or structural damage, downed power and communications lines, blocked roads, utility disruption, or loss of emergency access.

Wildfire

Table 64 summarizes wildfire vulnerabilities and potential impacts for Beaver County participants.

Table 64: Wildfire Vulnerability and Impact Assessment for Beaver County

Plan Participant	Vulnerabilities and Impacts
Beaver County	**Vulnerabilities:** Beaver County has a highly likely wildfire probability and is vulnerable where large areas of burnable vegetation, recurrent hot, dry, and windy fire-weather conditions, and dispersed development patterns expose people, property, infrastructure, and natural resources to wildfire. Countywide planning context includes approximately 7,301 residents and 3,102 housing units; these totals are not estimates of direct hazard exposure. Other assets include one county government and three incorporated communities distributed across 2,582.9 square miles, along with schools, government buildings, emergency response facilities, utility corridors, transportation routes, grazing lands, and watershed resources. Vulnerability is elevated in wildland-urban interface areas and along road and utility corridors where wildfire can threaten structures, interrupt access, and affect essential services. **Impacts:** Wildfire can threaten Beaver, Milford, and Minersville; damage homes, outbuildings, public facilities, fencing, utilities, and communications equipment; disrupt Interstate 15 and other transportation routes; affect grazing lands and tourism; and degrade air quality for residents and outdoor workers. Longer-term impacts can include erosion, watershed degradation, post-fire flooding, and debris-flow potential, meaning even a single wildfire can create countywide operational, environmental, and recovery consequences. **Critical Facilities and Critical Infrastructure Potentially Impacted:** Beaver County Administration Office; Beaver County Emergency Management; Beaver County Sheriff's Office, Beaver County Sheriff's Dispatch, Beaver County Jail, Search & Rescue, Animal Control, and other public safety facilities; Beaver Valley Hospital; Milford Memorial Hospital; Beaver County Road Department facilities, including the Beaver Road Shed and Milford Road Shed; Historic Fort Cameron, county-maintained roads, bridges, culverts, traffic-control devices, signs, drainage facilities, evacuation routes, and access routes; county public buildings, parks/facilities, emergency shelters, schools, water and wastewater systems, electric power, natural gas, communications, emergency

Plan Participant	Vulnerabilities and Impacts
	alert/dispatch systems, fuel-distribution and emergency-service support infrastructure, agricultural facilities, livestock operations, recreation areas, campgrounds, forest access roads, utility poles, overhead lines, radio towers, antennas, and utility corridors that may be affected by wildfire, smoke, ember exposure, structure ignition, evacuation constraints, power outages, water-system disruption, road closures, post-fire debris flows, or loss of emergency access.
Beaver City	**Vulnerabilities:** Beaver City is vulnerable where neighborhoods, public facilities, utilities, and transportation routes interface with nearby grass, shrub, or other vegetated fuels. The city may also be affected by smoke, evacuation needs, and infrastructure disruption if wildfire threatens nearby access routes, utility corridors, or surrounding lands. **Impacts:** Wildfire could damage structures and utilities, prompt evacuations, reduce air quality, threaten local roads, and increase firefighting and recovery costs. Smoke and protective actions may also affect residents, schools, businesses, and community services even when direct fire damage is limited. **Critical Facilities and Critical Infrastructure Potentially Impacted:** Beaver City Hall at 30 West 300 North; Beaver City Public Works water, sewer, streets, and infrastructure systems; Beaver City Water System, including water lines, meters, pumps, tanks, springs, wells, and service connections; Beaver City sewer system, including sewer lagoon and lift-station infrastructure; Beaver City Municipal Electric, including Lower Hydro 1, Middle Hydro 2, Upper Hydro 3, Beaver River hydroelectric facilities, 46 kV meter structure, overhead electric lines, utility poles, transformers, meters, and related electric distribution infrastructure; Beaver City utility billing and administrative service functions; Beaver City Pool; Beaver Public Library; Tushar Mountain Ball Complex; Canyon Breeze Golf Course; Beaver Municipal Airport; Mountain View Cemetery; Beaver Fire District #1 Fire House and emergency response facilities; Beaver Valley Hospital; schools, parks, public buildings, recreation areas, campgrounds, canyon access routes, local roads, bridges, culverts, traffic-control devices, signs, drainage channels, water and sewer lines, electric power and communications lines, antennas, radio/communications equipment, utility poles, overhead lines, and utility corridors within Beaver City that may be affected by wildfire, smoke, ember exposure, structure ignition, evacuation constraints, power outages, water-system disruption, road closures, post-fire debris flows, or loss of emergency access.
City of Milford	**Vulnerabilities:** Milford may be vulnerable where developed areas, utilities, industrial or agricultural support facilities, and transportation routes are adjacent to combustible vegetation or exposed to wildfire from surrounding lands. The community may also be affected by smoke, utility disruption, and travel limitations if wildfire threatens nearby corridors or open lands. **Impacts:** Potential impacts include structural threat, smoke and air quality problems, disruption of utilities and travel, and increased demands on local

Plan Participant	Vulnerabilities and Impacts
	firefighting resources. Even fires outside the city may affect public services, evacuation routes, and outdoor activity if smoke or road restrictions occur. **Critical Facilities and Critical Infrastructure Potentially Impacted:** Milford City Offices/City Hall at 26 South 100 West; Milford City Administrative Office; Milford City water, sewer, and garbage utility systems; Milford Municipal Water System, including culinary water wells, storage tanks, meters, service connections, and distribution mains; Milford wastewater system and lift station infrastructure; Milford DMV/Justice Court; Beaver County Sheriff's Office–Milford facilities; Beaver County Milford Administration Office; Beaver County Fire District #2/Milford Fire Department facilities; Milford Memorial Hospital and Milford Ambulance Service; Milford Medical Clinic; Milford Public Library; Milford Senior Citizen's Center; Milford Swimming Pool; Milford High School and Milford Elementary/School facilities; Milford Municipal Airport–Ben and Judy Briscoe Field; Milford Cemetery; Rocky Mountain Power electric service infrastructure; Enbridge Gas Utah natural gas service infrastructure; local communications infrastructure; Main Street, State Route 257, local roads, bridges, culverts, traffic-control devices, signs, drainage corridors, airport access roads, water and sewer lines, electric power and communications lines, antennas, radio/communications equipment, utility poles, overhead lines, and utility corridors within Milford that may be affected by wildfire, smoke, ember exposure, structure ignition, evacuation constraints, power outages, water-system disruption, road closures, post-fire debris flows, or loss of emergency access.
Town of Minersville	**Vulnerabilities:** Minersville is vulnerable where homes, town facilities, utilities, agricultural lands, and surrounding open space are exposed to wildfire ignition and spread from nearby vegetation or human activity. The town's rural setting and dependence on limited access routes and utility systems increase vulnerability if wildfire affects nearby roads, communications, or power infrastructure. **Impacts:** Wildfire can threaten property and life, impair air quality, affect utilities and roads, and create significant response, evacuation, and recovery challenges. Even geographically limited fires may disrupt community access, strain local resources, and create longer-term erosion or post-fire runoff concerns. **Critical Facilities and Critical Infrastructure Potentially Impacted:** Minersville Town Office/Town Hall at 60 West Main Street; Minersville Town water utility system, including groundwater supply, water mains, meters, service connections, and related water service infrastructure; Minersville Fire Department/Beaver County Fire District #2 facility at 118 South Center Street; Minersville School facilities; Minersville public buildings, parks, community facilities, and local government service functions; Minersville Reservoir and associated irrigation, recreation, campground, boat ramp, dock, culinary water, restroom, shower, sewage disposal, fish-cleaning, electric hookup, and access infrastructure; Minersville Reservoir & Irrigation Company infrastructure; Beaver River water-supply and irrigation infrastructure serving

Plan Participant	Vulnerabilities and Impacts
	the Minersville area; local streets, Utah State Route 21, Utah State Route 130, bridges, culverts, traffic-control devices, signs, drainage channels, water lines, utility corridors, overhead and underground power and communications infrastructure, antennas, radio/communications equipment, utility poles, overhead lines, recreation/campground facilities, and access routes that may be affected by wildfire, smoke, ember exposure, structure ignition, evacuation constraints, power outages, water-system disruption, road closures, post-fire debris flows, or loss of emergency access.

Winter Storms

Table 65 summarizes winter-storm vulnerabilities and potential impacts for Beaver County participants.

Table 65: Winter Storms Vulnerability and Impact Assessment for Beaver County

Plan Participant	Vulnerabilities and Impacts
Beaver County	**Vulnerabilities:** Beaver County has a high probability of future winter storm impacts due to higher elevations, colder winter temperatures, and exposure along major transportation corridors. Countywide planning context includes about 7,300 residents, approximately 2,500 households, and about 3,100 housing units. These totals are not mapped winter-storm exposure estimates. Residents age 65 or older represent 17.5% of the county population and may be especially vulnerable to prolonged cold, outages, and delayed access to care. Major exposed lifelines include Interstate 15, State Route 21, and mountain travel corridors, along with Beaver Valley Hospital, schools, public safety facilities, utilities, water and wastewater systems, and communications infrastructure vulnerable to snow, black ice, reduced visibility, power interruption, and prolonged cold. **Impacts:** Winter storms can produce moderate to major impacts in Beaver County, including hazardous travel, crashes, road closures, power outages, heating interruptions, frozen pipes, snow loading, delayed emergency response, and disruption to Beaver Valley Hospital, schools, businesses, and freight movement. Because the county depends on limited transportation and utility redundancy, even short-duration storms can isolate residents, interrupt supply deliveries, and create broader public health, economic, and continuity-of-operations challenges across Beaver County's 2,582.9 square miles. **Critical Facilities and Critical Infrastructure Potentially Impacted:** Beaver County Administration Office; Beaver County Emergency Management; Beaver County Sheriff's Office, Beaver County Sheriff's Dispatch, Beaver County Jail, Search & Rescue, Animal Control, and other public safety facilities; Beaver Valley Hospital; Milford Memorial Hospital; Beaver County Road Department facilities, including the Beaver Road Shed at 1616 North Highway 357 and Milford Road Shed at 899 South Highway 21; county-maintained roads, bridges, culverts, traffic-control devices, signs, drainage facilities, snow-plow

Plan Participant	Vulnerabilities and Impacts
	routes, and access routes; county public buildings, parks/facilities, emergency shelters, schools, water and wastewater systems, electric power, natural gas, communications, emergency alert/dispatch systems, fuel-distribution and emergency-service support infrastructure, agricultural facilities, livestock operations, exposed vehicles/equipment, utility poles, overhead lines, radio towers, antennas, and utility corridors that may be affected by snow accumulation, ice, freezing rain, high winds, reduced visibility, downed power and communications lines, frozen water or sewer components, blocked roads, delayed emergency response, power outages, or loss of emergency access.
Beaver City	**Vulnerabilities:** Beaver City is vulnerable to winter storms where homes, public buildings, roads, utilities, and residents depend on reliable winter access and uninterrupted heating and power. Snow, black ice, and prolonged cold can affect local travel, increase risk to older adults and medically vulnerable residents, and place stress on city infrastructure and services. **Impacts:** Winter storms may disrupt travel, increase crash risk, strain snow removal and utility operations, and affect schools, public facilities, and city services during prolonged cold or power interruptions. Even localized winter weather can create safety concerns, transportation delays, and added response and recovery costs for the community. **Critical Facilities and Critical Infrastructure Potentially Impacted:** Beaver City Hall at 30 West 300 North; Beaver City Public Works water, sewer, streets, and infrastructure systems; Beaver City Water System, including water lines, meters, pumps, tanks, springs, wells, and service connections; Beaver City sewer system, including sewer lagoon and lift-station infrastructure; Beaver City Municipal Electric, including Lower Hydro 1, Middle Hydro 2, Upper Hydro 3, Beaver River hydroelectric facilities, 46 kV meter structure, overhead electric lines, utility poles, transformers, meters, and related electric distribution infrastructure; Beaver City utility billing and administrative service functions; Beaver City Pool; Beaver Public Library; Tushar Mountain Ball Complex; Canyon Breeze Golf Course; Beaver Municipal Airport; Mountain View Cemetery; Beaver Fire District #1 Fire House and emergency response facilities; Beaver Valley Hospital; schools, parks, public buildings, local roads, bridges, culverts, traffic-control devices, signs, drainage channels, snow-removal routes, water and sewer lines, electric power and communications lines, antennas, radio/communications equipment, utility poles, overhead lines, and utility corridors within Beaver City that may be affected by snow accumulation, ice, freezing rain, high winds, reduced visibility, downed power and communications lines, frozen water or sewer components, blocked roads, delayed emergency response, power outages, or loss of emergency access.
City of Milford	**Vulnerabilities:** Milford is vulnerable to winter weather impacts on roads, utilities, buildings, and public safety during snow, ice, and freezing temperature events. As part of Beaver County's high winter storm probability setting, Milford may experience dangerous travel, power interruptions, frozen infrastructure, and service disruption that can affect residents, businesses, and emergency operations.

Plan Participant	Vulnerabilities and Impacts
	Impacts: Potential impacts include hazardous travel, outages, frozen or damaged infrastructure, increased heating demand, and interruption of public services and commercial activity. Even short-duration winter weather events can create recovery and maintenance burdens that are significant for a small community. **Critical Facilities and Critical Infrastructure Potentially Impacted:** Milford City Offices/City Hall at 26 South 100 West; Milford City Administrative Office; Milford City water, sewer, and garbage utility systems; Milford Municipal Water System, including culinary water wells, storage tanks, meters, service connections, and distribution mains; Milford wastewater system and lift station infrastructure; Milford DMV/Justice Court; Beaver County Sheriff's Office–Milford facilities; Beaver County Milford Administration Office; Beaver County Fire District #2/Milford Fire Department facilities; Milford Memorial Hospital and Milford Ambulance Service; Milford Medical Clinic; Milford Public Library; Milford Senior Citizen's Center; Milford Swimming Pool; Milford High School and Milford Elementary/School facilities; Milford Municipal Airport–Ben and Judy Briscoe Field; Milford Cemetery; Rocky Mountain Power electric service infrastructure; Enbridge Gas Utah natural gas service infrastructure; local communications infrastructure; Main Street, State Route 257, local roads, bridges, culverts, traffic-control devices, signs, drainage corridors, snow-removal routes, airport access roads, water and sewer lines, electric power and communications lines, antennas, radio/communications equipment, utility poles, overhead lines, and utility corridors within Milford that may be affected by snow accumulation, ice, freezing rain, high winds, reduced visibility, downed power and communications lines, frozen water or sewer components, blocked roads, delayed emergency response, power outages, or loss of emergency access.
Town of Minersville	**Vulnerabilities:** Minersville is vulnerable where residents, local roads, utilities, community facilities, and surrounding agricultural operations are exposed to snow, ice, and prolonged cold weather. The town's rural setting and dependence on limited transportation and utility systems increase vulnerability if winter storms affect travel, power, heating, or emergency access. **Impacts:** Winter storms can impair transportation, disrupt services, create safety hazards, and increase response and recovery demands on the town. Even localized winter weather may isolate residents, delay emergency response, affect utilities and heating, and create added repair and operational costs for local government and households. **Critical Facilities and Critical Infrastructure Potentially Impacted:** Minersville Town Office/Town Hall at 60 West Main Street; Minersville Town water utility system, including groundwater supply, water mains, meters, service connections, and related water service infrastructure; Minersville Fire Department/Beaver County Fire District #2 facility at 118 South Center Street; Minersville School facilities; Minersville public buildings, parks, community facilities, and local government service functions; Minersville Reservoir and

Plan Participant	Vulnerabilities and Impacts
	associated irrigation, recreation, campground, boat ramp, dock, culinary water, restroom, shower, sewage disposal, fish-cleaning, electric hookup, and access infrastructure; Minersville Reservoir & Irrigation Company infrastructure; Beaver River water-supply and irrigation infrastructure serving the Minersville area; local streets, Utah State Route 21, Utah State Route 130, bridges, culverts, traffic-control devices, signs, drainage channels, snow-removal routes, water lines, utility corridors, overhead and underground power and communications infrastructure, antennas, radio/communications equipment, utility poles, overhead lines, exposed vehicles/equipment, and access routes that may be affected by snow accumulation, ice, freezing rain, high winds, reduced visibility, downed power and communications lines, frozen water or sewer components, blocked roads, delayed emergency response, power outages, or loss of emergency access.

Changes in Development

This plan update considers whether development since the previous plan has changed each participant's vulnerability. A change in population, construction, or economic activity does not by itself establish increased or decreased vulnerability. The determination must consider where development occurred, the relevant hazard area, applicable design and land-use controls, infrastructure capacity, and whether exposure or expected consequences changed.

Beaver County's population increased from 7,072 in the 2020 Census to an estimated 7,301 on July 1, 2025. The county also recorded 48 building permits in 2025. These figures indicate modest growth but do not show where new development occurred relative to hazard areas. Long-range state projections and the Mineral Mountains Project Area identify the potential for additional residential, employment, utility, transportation, and industrial development; however, proposed development is not treated as existing exposure.[170]

Future development could increase exposure if people, structures, utilities, or access routes are added in flood-prone areas, the wildland-urban interface, unstable or problem-soil areas, dam-inundation areas, or locations with limited water, power, transportation, or emergency-service redundancy. Development review, zoning, subdivision requirements, building-code administration, geotechnical investigation, floodplain management, water planning, emergency access, and capital programming can reduce or avoid added risk. Because participant-specific development locations and their relationship to hazard areas are not established by the available records, Table 66 reports an indeterminate finding rather than an unsupported increase, decrease, or unchanged condition.

[170] U.S. Census Bureau, QuickFacts: Beaver County, Utah, population estimates and 2025 building permits. https://www.census.gov/quickfacts/fact/table/beavercountyutah/RHI125225. Utah Inland Port Authority, Mineral Mountains Project Area. https://inlandportauthority.utah.gov/mineralmountains/. Accessed October 9, 2026.

Table 66 distinguishes potential effects of future development from observed changes since the previous plan. The available records do not identify development locations, jurisdiction-owned assets outside the planning area, or completed mitigation by participant sufficiently to determine increased, unchanged, or decreased vulnerability. An indeterminate finding is not a finding of unchanged vulnerability.

Table 66: Vulnerability Changes in Beaver County

Plan Participant	Increased	Stayed the Same	Decreased
Beaver County	Potential added exposure in unincorporated floodplains, wildland-urban interface, unstable slopes or problem soils, and dam-inundation areas; rural water, utility, and access constraints remain relevant. No documented increase is established by the available development record. No participant-specific observed increase is established.	Indeterminate: available participant-specific development and mitigation records do not establish whether vulnerability stayed the same.	No decrease is established by the available participant-specific records.
Beaver City	Potential added exposure where new development intersects local drainageways, nearby vegetated slopes, or vulnerable water, electric, and canyon-access systems. No documented increase is established by the available development record. No participant-specific observed increase is established.	Indeterminate: available participant-specific development and mitigation records do not establish whether vulnerability stayed the same.	No decrease is established by the available participant-specific records.
City of Milford	Potential added exposure where residential, industrial, or logistics development increases demands on municipal water, drainage, utilities, and transportation corridors. No documented increase is	Indeterminate: available participant-specific development and mitigation records do not establish whether vulnerability stayed the same.	No decrease is established by the available participant-specific records.

Plan Participant	Increased	Stayed the Same	Decreased
	established by the available development record. No participant-specific observed increase is established.		
Town of Minersville	Potential added exposure where development intersects drainageways, reservoir-related inundation areas, wildfire fuels, problem soils, or constrained water and access systems. No documented increase is established by the available development record. No participant-specific observed increase is established.	Indeterminate: available participant-specific development and mitigation records do not establish whether vulnerability stayed the same.	No decrease is established by the available participant-specific records.

Capability Assessment

The capability assessment identifies the plans, regulations, staff, technical resources, funding mechanisms, outreach methods, and floodplain-management functions available to support mitigation. The assessment informs action feasibility, implementation responsibility, potential resources, and capability-improvement needs. Where a capability could not be confirmed, this annex does not assume that it exists. The local capability inventory describes the planning and administrative framework reported in the annex. Dated ordinance, staffing, and implementation records are not available to independently establish each entry's current status; the inventory does not demonstrate NFIP enforcement or completion of individual mitigation actions.

Beaver County Capability Assessment

Table 67 describes the mitigation capabilities for Beaver County.

Table 67: Beaver County Capability Assessment

Capability	Description
Plans and Regulations	Beaver County General Plan, amended February 1999; Beaver County Resource Management Plan, 2017; Southwest Utah Regional Community Wildfire Protection Plan, adopted October 26, 2007; and building codes adopted pursuant to applicable Utah requirements.

Capability	Description
	Beaver County Planning and Zoning review processes; zoning administration; subdivision and land use review procedures; building permit and inspection requirements for unincorporated Beaver County; and adopted county ordinances that guide growth, development, and code administration. These plans and regulations provide the County with authority to incorporate hazard considerations into land use, subdivision, infrastructure, and construction decisions.
Administrative and Technical	Beaver County has administrative and technical capabilities through its Planning and Zoning Department, Zoning Administrator, Building Department, permit and inspection program, county legal counsel, and emergency management coordination. The Building Department handles permits and inspections for unincorporated Beaver County and provides contracted inspection services for Beaver City, Milford City, and Minersville Town. These capabilities support mitigation through development review, code administration, infrastructure coordination, project implementation, and emergency planning.
Financial	Beaver County can support mitigation using local budget authority, capital improvement planning, fee-based permitting, grant administration, and partnerships with state and federal programs. Potential funding sources include FEMA hazard mitigation assistance programs, other emergency management and infrastructure grants, and local cost share where available. These tools can support both smaller operational improvements and larger capital projects intended to reduce long-term hazard risk.
Education and Outreach	Beaver County supports education and outreach through its official website and social media pages, Planning and Zoning notices and public meetings, emergency notifications, and public alert systems. The County provides access to alerts through its Alert Center and emergency communication resources, which can be used to share preparedness information, road closures, severe weather notifications, wildfire information, and other public safety messages. These tools create opportunities to improve public awareness of hazard risks and mitigation actions.
National Flood Insurance Program	FEMA lists Beaver County as an NFIP-participating community (Community 490001). The effective-map field is recorded as (All Zone D); this is not a local ordinance-adoption date. No CRS class is reported in this entry. The status book establishes program status, not local permitting, enforcement, or substantial-improvement/substantial-damage implementation. Participant-specific implementation records and repetitive-loss/severe-repetitive-loss building counts and types are not established by the available evidence; no zero count or finding of compliance is inferred.[171]

[171] FEMA, OpenFEMA NFIP Community Status Book, Utah records, retrieved October 10, 2026; dataset refresh August 25, 2026. https://www.fema.gov/api/open/v1/NfipCommunityStatusBook. Map dates are FEMA effective-map entries, not evidence of local adoption or implementation.

The following describes opportunities to expand and improve upon Beaver County's mitigation capabilities. This includes:

- **Plans and Regulations:** Update and maintain the Beaver County General Plan, review the Community Wildfire Protection Plan for continued relevance, and continue integrating hazard mitigation into zoning, subdivision review, capital improvement planning, and development standards for unincorporated areas.
- **Administrative and Technical:** Continue strengthening coordination among Planning and Zoning, the Building Department, emergency management, road and bridge functions, utilities, and participating jurisdictions to support project development, data sharing, grant management, and implementation of mitigation actions.
- **Financial:** Expand the County's ability to fund mitigation by identifying priority projects early, preparing grant-ready scopes of work, pursuing FEMA and state funding opportunities, and aligning mitigation needs with annual budgeting and capital improvement planning.
- **Education and Outreach:** Improve public awareness by expanding use of county alerts, website content, public meetings, and partner coordination to share information on wildfire preparedness, flood risk, drought and heat safety, winter travel hazards, and property-level mitigation actions.
- **National Flood Insurance Program:** The County can continue to strengthen this capability by maintaining compliant development review practices in mapped flood hazard areas, clarifying local floodplain administration responsibilities, and coordinating with Utah floodplain management resources and FEMA flood mapping tools.

Beaver City Capability Assessment

Table 68 describes the mitigation capabilities for Beaver City.

Table 68: Beaver City Capability Assessment

Capability	Description
Plans and Regulations	General Plan (adopted 1994); Beaver City Code and Zoning Regulations; Transportation Master Plan (adopted 2023) Beaver City Planning and Zoning Commission processes; zoning, land use, subdivision, conditional use permit, variance, and site plan review procedures; city permit application processes; and building permit administration coordinated with Beaver County Building Department for inspections. These tools allow Beaver City to guide land use, review development proposals, and incorporate hazard considerations into growth, redevelopment, and construction decisions.
Administrative and Technical	Beaver City has administrative and technical capability through City Hall administration, the Planning and Zoning Commission, public works functions, coordination with Beaver County Building Department for inspections, and coordination with county emergency management and

Capability	Description
	public safety partners. These capabilities support implementation of mitigation through development review, infrastructure maintenance, code administration, project coordination, and emergency planning.
Financial	Beaver City can support mitigation using local budget authority, capital improvement planning, utility revenues, fee-based permitting, and grant applications coordinated with county, state, and federal programs. Potential funding sources include FEMA hazard mitigation assistance programs, state infrastructure and emergency management programs, and local cost share where available. These tools can help fund both smaller operational improvements and larger capital projects that reduce hazard risk.
Education and Outreach	Beaver City supports education and outreach through the City's website and social media pages, through public meetings, planning and zoning hearings, permit information, city website notices, and coordination with county emergency notifications and preparedness information. These channels provide opportunities to share hazard information, notify residents of development and infrastructure issues, and increase awareness of preparedness, wildfire risk reduction, severe weather safety, and other mitigation topics.
National Flood Insurance Program	No separate NFIP or CRS entry for Beaver City was found in the complete Utah Community Status Book records reviewed. County participation does not establish municipal participation; the absence of an entry does not establish absence of local floodplain regulation. The status book establishes program status, not local permitting, enforcement, or substantial-improvement/substantial-damage implementation. Participant-specific implementation records and repetitive-loss/severe-repetitive-loss building counts and types are not established by the available evidence; no zero count or finding of compliance is inferred.[172]

The following describes opportunities to expand and improve upon Beaver City's mitigation capabilities. This includes:

- **Plans and Regulations:** Update and maintain the Beaver City General Plan, transportation planning documents, and zoning regulations, and continue integrating hazard mitigation into land use decisions, subdivision review, redevelopment, and future infrastructure planning.
- **Administrative and Technical:** Continue strengthening coordination among City Hall, planning and zoning, public works, the Beaver County Building Department, and emergency management partners to support project development, data sharing, permitting consistency, and implementation of mitigation actions.

[172] FEMA, OpenFEMA NFIP Community Status Book, Utah records, retrieved October 10, 2026; dataset refresh August 25, 2026. https://www.fema.gov/api/open/v1/NfipCommunityStatusBook Map dates are FEMA effective-map entries, not evidence of local adoption or implementation.

- **Financial:** Expand Beaver City's ability to fund mitigation by identifying priority projects early, aligning mitigation needs with capital improvement planning and utility investments, and pursuing FEMA, state, and other grant opportunities with local match strategies where feasible.
- **Education and Outreach:** Improve public awareness by expanding use of the city website, public meetings, planning notices, and coordination with county emergency alerts to share information on wildfire preparedness, flood risk, severe weather safety, winter travel hazards, and property-level mitigation actions.
- **National Flood Insurance Program:** Confirm Beaver City's floodplain-management authority and procedures and evaluate formal NFIP participation. Document the map and ordinance used for development review, administrator responsibilities, permitting and enforcement, substantial-improvement and substantial-damage procedures, and coordination with Beaver County and Utah floodplain-management resources.

City of Milford Capability Assessment

Table 69 describes the mitigation capabilities for the City of Milford.

Table 69: City of Milford Capability Assessment

Capability	Description
Plans and Regulations	Milford City Municipal Code (codified in 2019); Milford Planning and Zoning Commission processes; zoning permit, annexation, variance, conditional use permit, site plan review, lot line adjustment, plat amendment, sign permit, and zoning amendment procedures; and building permit coordination with Beaver County Building Department. These plans and regulations provide Milford with authority to guide land use, review development proposals, and incorporate hazard considerations into zoning, subdivision, and construction decisions.
Administrative and Technical	Milford has administrative and technical capability through City Hall administration, the Planning and Zoning Commission, the Zoning Administrator, public works functions, and coordination with Beaver County Building Department for permit processing and inspections. Milford handles the zoning portion of the permit process and permit payment, while Beaver County provides application processing and inspection services. These capabilities support mitigation through development review, code administration, infrastructure maintenance, project coordination, and emergency planning.
Financial	Milford can support mitigation using local budget authority, capital improvement planning, utility revenues and fees, permit-related fees, and grant applications coordinated with county, state, and federal programs. Potential funding sources include FEMA hazard mitigation assistance programs, state infrastructure and emergency management programs, and local cost share where available. These tools can help fund both routine

Capability	Description
	resilience improvements and larger capital projects that reduce long-term hazard risk.
Education and Outreach	Milford supports education and outreach through the City's website and social media pages, public meetings, Planning and Zoning Commission hearings, permit information posted on the city website, public notices, and coordination with Beaver County emergency notifications and preparedness resources. These channels provide opportunities to share hazard information, notify residents about development and infrastructure issues, and increase awareness of wildfire safety, severe weather, flooding, and other mitigation topics.
National Flood Insurance Program	FEMA lists Milford as an NFIP-participating community (Community 490003). The effective-map field is recorded as (NSFHA); this is not a local ordinance-adoption date. No CRS class is reported in this entry. The status book establishes program status, not local permitting, enforcement, or substantial-improvement/substantial-damage implementation. Participant-specific implementation records and repetitive-loss/severe-repetitive-loss building counts and types are not established by the available evidence; no zero count or finding of compliance is inferred.[173]

The following describes opportunities to expand and improve upon Milford's mitigation capabilities. This includes:

- **Plans and Regulations:** Update and maintain Milford's municipal code, zoning procedures, and other development regulations, and continue integrating hazard mitigation into land use decisions, subdivision review, infrastructure planning, and future growth areas.
- **Administrative and Technical:** Continue strengthening coordination among City Hall, planning and zoning, public works, the Beaver County Building Department, and emergency management partners to support project development, permitting consistency, data sharing, and implementation of mitigation actions.
- **Financial:** Expand Milford's ability to fund mitigation by identifying priority projects early, aligning mitigation needs with capital improvement planning and utility investments, and pursuing FEMA, state, and other grant opportunities with local match strategies where feasible.
- **Education and Outreach:** Improve public awareness by expanding use of the city website, public meetings, planning notices, and coordination with county emergency alerts to share information on wildfire safety, flood risk, severe weather, extreme heat, and property-level mitigation actions.
- **National Flood Insurance Program:** Maintain NFIP participation by documenting local authority, administrator responsibilities, current mapping, permitting and enforcement, recordkeeping,

[173] FEMA, OpenFEMA NFIP Community Status Book, Utah records, retrieved October 10, 2026; dataset refresh August 25, 2026. https://www.fema.gov/api/open/v1/NfipCommunityStatusBook. Map dates are FEMA effective-map entries, not evidence of local adoption or implementation.

substantial-improvement and substantial-damage procedures, training, outreach, and coordination with Beaver County, Utah floodplain-management resources, and FEMA.

Town of Minersville Capability Assessment

Table 70 describes the mitigation capabilities for the Town of Minersville.

Table 70: Town of Minersville Capability Assessment

Capability	Description
Plans and Regulations	Minersville Town Code of Ordinances (February 6, 2023); Minersville zoning map and zoning district information; local zoning, business license, and permit processes; and building permit coordination with Beaver County Building Department. Minersville handles the zoning portion of the permit process, while permit application, payment, and inspections are processed through Beaver County. These plans and regulations provide Minersville with authority to guide land use, review development proposals, and incorporate hazard considerations into zoning, siting, and construction decisions.
Administrative and Technical	Minersville has administrative and technical capability through Town administration, local zoning functions, Town Hall services, public works coordination, and coordination with Beaver County Building Department for permit processing and inspections. These capabilities support mitigation through development review, code administration, infrastructure maintenance, project coordination, and emergency planning.
Financial	Minersville can support mitigation using local budget authority, fee-based permits and licenses, utility and service revenues, capital improvement planning, and grant applications coordinated with county, state, and federal programs. Potential funding sources include FEMA hazard mitigation assistance programs, state infrastructure and emergency management programs, and local cost share where available. These tools can help fund both routine resilience improvements and larger capital projects that reduce long-term hazard risk.
Education and Outreach	Minersville supports education and outreach through the Town's website and social media pages, public meetings, Town Hall communications, town website notices, community alerts and subscription services, and coordination with Beaver County emergency notifications and preparedness resources. These channels provide opportunities to share hazard information, notify residents about development and infrastructure issues, and increase awareness of heat safety, wildfire risk reduction, severe weather, flooding, and other mitigation topics.
National Flood Insurance Program	No separate NFIP or CRS entry for Minersville was found in the complete Utah Community Status Book records reviewed. County participation does not establish municipal participation; the absence of an entry does not

Capability	Description
	establish absence of local floodplain regulation. The status book establishes program status, not local permitting, enforcement, or substantial-improvement/substantial-damage implementation. Participant-specific implementation records and repetitive-loss/severe-repetitive-loss building counts and types are not established by the available evidence; no zero count or finding of compliance is inferred.[174]

The following describes opportunities to expand and improve upon Minersville's mitigation capabilities. This includes:

- **Plans and Regulations:** Update and maintain Minersville's code of ordinances, zoning information, and development procedures, and continue integrating hazard mitigation into land use decisions, site review, infrastructure planning, and future growth management.
- **Administrative and Technical:** Continue strengthening coordination among Town administration, local zoning functions, public works, the Beaver County Building Department, and emergency management partners to support project development, permitting consistency, data sharing, and implementation of mitigation actions.
- **Financial:** Expand Minersville's ability to fund mitigation by identifying priority projects early, aligning mitigation needs with capital improvement planning and infrastructure investments, and pursuing FEMA, state, and other grant opportunities with local match strategies where feasible.
- **Education and Outreach:** Improve public awareness by expanding use of the town website, public meetings, community notices, and coordination with county emergency alerts to share information on heat safety, wildfire risk reduction, flooding, severe weather, and property-level mitigation actions.
- **National Flood Insurance Program:** Evaluate formal NFIP participation and document the decision. In the interim, confirm local flood-risk review authority and procedures and coordinate with Beaver County, Utah floodplain-management resources, and FEMA mapping resources.

Status of Previous Mitigation Actions

Beaver County and its communities have participated in previous iterations of the multi-jurisdictional hazard mitigation plan and identified strategies to mitigate natural hazard risks. Describing the status of previous mitigation actions helps demonstrate the ongoing progress made to reduce risk and the communities' commitment to mitigation. At the same time, it serves as an opportunity to evaluate whether an incomplete action is still worth pursuing. Standard status categories are Complete, In Progress – Still Relevant, Deferred, No Longer Relevant, and Status Unknown / Unable to Verify. Carrying an action concept forward does not verify implementation progress; where supporting implementation

[174] FEMA, OpenFEMA NFIP Community Status Book, Utah records, retrieved October 10, 2026; dataset refresh August 25, 2026. https://www.fema.gov/api/open/v1/NfipCommunityStatusBook. Map dates are FEMA effective-map entries, not evidence of local adoption or implementation.

documentation is unavailable, the status is identified as unknown and the previously reported status is retained for traceability.

Table 71 describes progress made on the mitigation actions identified for communities in Beaver County in the 2022–2027 hazard mitigation plan.

Table 71: Status of 2022–2027 Mitigation Actions for Beaver County

Action Identifier	Action	Status and Explanation
BC-2022-DR-01 (formerly Drought #1)	Provide the public with information about ongoing drought conditions and conservation efforts from Slow the Flow.	Previously reported status: In Progress – Still Relevant; action concept carried forward into the 2027–2032 mitigation strategy and will be evaluated during annual monitoring.
BC-2022-DR-02 (formerly Drought #2)	Provide agricultural interests with information about crop insurance and encourage participation. Provide information on County website.	Previously reported status: In Progress – Still Relevant; action concept carried forward into the 2027–2032 mitigation strategy and will be evaluated during annual monitoring.
BC-2022-EQ-01 (formerly Earthquake #1)	Inventory and assess county owned structures for unreinforced masonry. Where need is identified, implement structural and nonstructural retrofits.	Previously reported status: In Progress – Still Relevant; action concept carried forward into the 2027–2032 mitigation strategy and will be evaluated during annual monitoring.
BC-2022-EQ-02 (formerly Earthquake #2)	Participate in the Great Utah ShakeOut and provide public education for earthquake safety. Directly work with county departments, schools, and businesses to participate.	Previously reported status: In Progress – Still Relevant; action concept carried forward into the 2027–2032 mitigation strategy and will be evaluated during annual monitoring.
BC-2022-SW-01 (formerly Severe Weather #1)	Coordinate with fire special service districts to acquire generators.	Previously reported status: In Progress – Still Relevant; action concept carried forward into the 2027–2032 mitigation strategy and will be evaluated during annual monitoring.
BC-2022-SW-02 (formerly Severe Weather #2)	Coordinate with identified county and municipal emergency operations centers to ensure they are set up to operate with power outage. As needed, acquire generators for these spaces.	Previously reported status: In Progress – Still Relevant; action concept carried forward into the 2027–2032 mitigation strategy and will be evaluated during annual monitoring.
BC-2022-WI-01	Coordinate with the U.S. Forest Service to engage in fuels reduction	Previously reported status: In Progress – Still Relevant; action concept carried forward into

Action Identifier	Action	Status and Explanation
(formerly Wildfire #1)	and mitigation on the east side of the County.	the 2027–2032 mitigation strategy and will be evaluated during annual monitoring.
BC-2022-WI-02 (formerly Wildfire #2)	Coordinate with BLM[175] and property owners throughout County.	Previously reported status: In Progress – Still Relevant; action concept carried forward into the 2027–2032 mitigation strategy and will be evaluated during annual monitoring.
BC-2022-WI-03 (formerly Wildfire #3)	Provide voluntary site visits to communities at riskby fire crews to consult with landowners about specific ways to reduce risk to their property.[176]	Previously reported status: In Progress – Still Relevant; action concept carried forward into the 2027–2032 mitigation strategy and will be evaluated during annual monitoring.
BC-2022-LS-01 (formerly Landslide #1)	Assess and consider need for hillside and geologic hazard ordinances.	Previously reported status: In Progress – Still Relevant; action concept carried forward into the 2027–2032 mitigation strategy and will be evaluated during annual monitoring.
BC-2022-FL-01 (formerly Flood #1)	Provide public information about NFIP participation on the County website.	Previously reported status: In Progress – Still Relevant; action concept carried forward into the 2027–2032 mitigation strategy and will be evaluated during annual monitoring.
BC-2022-FL-02 (formerly Flood #2)	Restructure and rebuild the drainage from the Minersville lake.	Previously reported status: In Progress – Still Relevant; action concept carried forward into the 2027–2032 mitigation strategy and will be evaluated during annual monitoring.
BC-2022-FL-03 (formerly Flood #3)	Add culverts on the county road into Indian Peaks to control roadway flooding.	Previously reported status: In Progress – Still Relevant; action concept carried forward into the 2027–2032 mitigation strategy and will be evaluated during annual monitoring.
BC-2022-FL-04 (formerly Flood #4)	Participate in flood mapping efforts in Beaver County.	Previously reported status: In Progress – Still Relevant; action concept carried forward into the 2027–2032 mitigation strategy and will be evaluated during annual monitoring.
BC-2022-FL-05 (formerly Flood #5)	Coordinate with UDOT to install flash flood warning signs on the Beaver Canyon Road.	Previously reported status: In Progress – Still Relevant; action concept carried forward into the 2027–2032 mitigation strategy and will be evaluated during annual monitoring.

[175] BLM = Bureau of Land Management

[176] Utah Division of Forestry, Fire and State Lands, Wildfire Risk, Communities at Risk. https://ffsl.utah.gov/wildland-fire/prevention-preparedness/wildfire-risk/. Accessed October 9, 2026.

Action Identifier	Action	Status and Explanation
BC-2022-PS-01 (formerly Problem Soil #1)	Coordinate with the Utah Geological Survey to map and identify the extent of problem soils in the County.	Previously reported status: In Progress – Still Relevant; action concept carried forward into the 2027–2032 mitigation strategy and will be evaluated during annual monitoring.
BC-2022-RN-01 (formerly Radon #1)	Engage in a public education campaign to inform residents of the risks, testing availability, and mitigation of radon. To be distributed on County website.	Previously reported status: In Progress – Still Relevant; action concept carried forward into the 2027–2032 mitigation strategy and will be evaluated during annual monitoring.
BC-2022-RN-02 (formerly Radon #2)	Coordinate with the Beaver County School District to engage in radon testing in K–12 public schools.	Previously reported status: In Progress – Still Relevant; action concept carried forward into the 2027–2032 mitigation strategy and will be evaluated during annual monitoring.

Mitigation Goals

The communities of Beaver County approve the identification of the mitigation goals for the Five County AOG Region as outlined in the base plan, including the following goals and objectives:

Goal 1: Protect Life and Property

Goal Statement: Reduce long-term risk to people and public, private, residential, agricultural, and commercial property through appropriate structural and nonstructural mitigation measures.

Objective: Reduce the potential for injury, loss of life, property damage, and disruption by directing mitigation resources toward documented hazards and vulnerable people, structures, and locations.

Goal 2: Protect Critical Facilities, Infrastructure, and Community Lifelines

Goal Statement: Reduce risk to critical facilities, infrastructure systems, and community lifelines and improve their ability to continue or rapidly restore essential functions following natural hazard events.

Objective: Promote mitigation, redundancy, protective design, maintenance, and other risk-reduction measures that limit damage and service interruptions affecting essential community functions.

Goal 3: Strengthen Public Education and Risk Communication

Goal Statement: Improve residents' and visitors' understanding of natural hazards, protective measures, insurance and other risk-transfer options where applicable, and actions they can take to reduce risk.

Objective: Provide accessible, hazard-specific information and outreach that supports informed risk-reduction decisions and addresses the needs of people and locations that may experience disproportionate hazard impacts.

Goal 4: Strengthen Partnerships and Coordination

Goal Statement: Coordinate mitigation planning and implementation among participating jurisdictions; local, state, Tribal, and federal agencies; nonprofit and community organizations; businesses; infrastructure owners and operators; academia; and other relevant partners.

Objective: Maintain partnerships that improve information sharing, align authorities and resources, support cross-jurisdictional projects, and address hazards and landscapes that cross jurisdictional boundaries, including coordination with federal land-management partners where applicable.

Goal 5: Strengthen the Resilience of Emergency Services

Goal Statement: Reduce pre-disaster risk to emergency services, personnel, facilities, equipment, communications, access routes, and supporting systems needed to protect the public during and after natural hazard events.

Objective: Improve the continuity, redundancy, reliability, and hazard resistance of emergency-service capabilities through sustained mitigation actions undertaken before disasters occur.

Goal 6: Protect and Use Natural Systems

Goal Statement: Protect, restore, and manage natural systems and landscapes where those measures can reduce natural hazard risk and provide compatible environmental and community benefits.

Objective: Advance feasible nature-based and watershed-, forest-, rangeland-, and landscape-scale mitigation measures that reduce long-term risk to communities, infrastructure, property, and economic resources while maintaining or improving natural functions.

2027–2032 Mitigation Action Plan for Beaver County

Participating jurisdictions within Beaver County reviewed the regional mitigation action catalog and selected the actions most appropriate to their identified risks, vulnerabilities, capabilities, and development trends. Table 72 identifies the actions selected by each jurisdiction. The selected actions

address the hazards prioritized in the county and community risk assessments and support achievement of the regional mitigation goals. Each participant has at least one action addressing every applicable hazard through the regional catalog. Section 6.2 provides the full action analysis, prioritization, responsible parties, funding sources, costs, schedules, and hazard coverage incorporated by reference.

Table 72: 2027–2032 Mitigation Action Selection for Beaver County Participants

Action Identifier	Action Description	Jurisdictions
FCA-DF-01	Update dam-failure warning, evacuation, and public-information procedures for inundation areas.	City of Milford; Town of Minersville
FCA-DF-02	Formalize real-time communication protocols with dam owners, state partners, and upstream and downstream jurisdictions.	City of Milford; Town of Minersville
FCA-DF-03	Assess critical infrastructure and development exposure within mapped dam-inundation areas.	Town of Minersville
FCA-DR-03	Reduce water demand through leak detection, efficient fixtures, irrigation upgrades, turf replacement, and waterwise landscaping.	Beaver County
FCA-DR-04	Support agricultural drought resilience through irrigation efficiency, soil-moisture conservation, drought-tolerant practices, producer outreach, and promotion of applicable crop insurance.	Beaver County
FCA-EQ-01	Inventory and evaluate unreinforced masonry, older public buildings, schools, and critical facilities for retrofit.	Beaver County
FCA-EQ-04	Participate annually in the Great Utah ShakeOut or a comparable earthquake exercise and engage local departments, schools, businesses, and residents.	Beaver County
FCA-FL-02	Construct prioritized drainage, culvert, bridge, detention, channel, erosion-control, and bank-stabilization improvements.	Beaver County
FCA-FL-07	Participate in FEMA Risk MAP,[177] local flood-hazard mapping, and National Flood Insurance Program activities; provide residents and property owners with current flood-risk and NFIP information.	Beaver County

[177] Risk MAP = Risk Mapping, Assessment, and Planning

Action Identifier	Action Description	Jurisdictions
FCA-FL-08	Install, improve, or replace low-water crossings, flash-flood warning signs, and roadway drainage controls at documented flood-prone routes.	Beaver County
FCA-MH-02	Protect essential services through backup power, redundant communications, fuel planning, hardening, and mutual aid.	Beaver County
FCA-PS-02	Update problem-soil mapping and inventory locations where soil conditions have damaged assets.	Beaver County
FCA-PS-04	Adopt or update a geologic-hazards ordinance establishing mapping, investigation, disclosure, review, and mitigation requirements for development in identified hazard areas.	Beaver County
FCA-RN-01	Provide recurring radon-risk, testing, and mitigation information through public and partner channels.	Beaver County
FCA-RN-02	Test public facilities for radon and mitigate where results exceed applicable action levels.	Beaver County
FCA-WI-02	Inventory and reduce hazardous fuels around critical facilities, utilities, roads, and community boundaries.	Beaver County
FCA-WI-05	Offer voluntary parcel- or home-level wildfire risk assessments and site visits to identify defensible-space, access, vegetation, and structure-hardening opportunities.	Beaver County

Action Selection and Analysis

Action selection draws on the regional catalog of planning and regulatory measures, infrastructure projects, natural systems protection, education and outreach, and capability improvements. Section 6.2 provides the analysis of alternatives and prioritization framework. Participant-specific capability constraints, technical and administrative feasibility, expected benefits and costs, potential funding and local match, and implementation timing guide project development and sequencing. Selected actions remain subject to available resources, applicable approvals, and annual review; inclusion in the matrix does not establish that funding has been secured.

Plan Integration

Plan integration is the process of incorporating information from the hazard mitigation plan into other planning mechanisms or the governance structures that manage long-term community development and decision-making, including budgets, comprehensive plans, economic development strategies, and other long-range planning documents. Plan integration helps promote mitigation project implementation by incorporating data and actions across programs and day-to-day operations.

During planning team meetings, Beaver County participants identified opportunities for integrating hazard mitigation into other local planning mechanisms, including comprehensive plans, capital improvement programs, infrastructure investment decisions, zoning regulations, emergency management activities, and public education efforts. Participants agreed that embedding mitigation objectives into existing local decision-making processes can improve long-term implementation and resilience outcomes.

Integration of Prior Plan

The plan participants reviewed their integration of their prior plan as shown in Table 73.

Table 73: Beaver County Integration of the 2022–2027 Plan

Plan Participant	Description
Beaver County	Beaver County integrated the 2022–2027 mitigation plan by using hazard, vulnerability, and mitigation action information to inform county planning, development review, emergency management coordination, interagency partnerships, public outreach, and capital improvement discussions. Prior plan information supported continued coordination among County departments, participating communities, fire districts, public works, state and federal partners, and other stakeholders to address wildfire, flooding, drought, severe weather, earthquake, radon, problem soils, and other identified hazards. Beaver County used the previous plan as a reference for aligning mitigation priorities with existing planning mechanisms, maintaining eligibility for mitigation funding, and identifying actions that should be carried forward, updated, or reconsidered during the 2027–2032 plan cycle.
Beaver City	Beaver City integrated the 2022–2027 mitigation plan by considering identified hazards, vulnerabilities, and mitigation actions during local planning and zoning review, infrastructure maintenance, public works coordination, emergency preparedness activities, and community outreach. The prior plan helped Beaver City connect mitigation needs with existing mechanisms such as the General Plan, transportation planning, zoning and development review, utility and public works operations, and coordination with Beaver County Building Department and emergency management partners. This integration supports mitigation planning linked to day-to-day local decision-making and helped identify actions that remain relevant for continued implementation in the 2027–2032 plan cycle.

Plan Participant	Description
City of Milford	Milford integrated the 2022–2027 mitigation plan by using prior plan information to support local planning, zoning administration, development review, public works coordination, utility planning, emergency preparedness, and outreach to residents and businesses. Hazard and vulnerability information from the previous plan informed continued attention to flooding, drought, extreme heat, severe weather, wildfire, winter storms, utility disruption, and other hazards affecting municipal facilities, transportation routes, water and wastewater systems, and community services. Milford used the previous plan to connect mitigation priorities with municipal code administration, capital and utility planning, grant coordination, and intergovernmental partnerships, while identifying which prior actions should be continued, revised, or incorporated into the 2027–2032 mitigation strategy.
Town of Minersville	Minersville integrated the 2022–2027 mitigation plan by using hazard and mitigation information to support town decision-making related to zoning, building permit coordination, public works, water system operations, emergency preparedness, outreach, and coordination with Beaver County and partner agencies. The previous plan provided a framework for considering risks from flooding, wildfire, drought, severe weather, winter storms, problem soils, radon, and other hazards when reviewing development, maintaining infrastructure, and identifying projects that reduce long-term risk. Minersville used the prior plan to link mitigation with existing local planning mechanisms, identify implementation progress and remaining needs, and carry forward relevant priorities into the 2027–2032 plan update.

Integration of Current Plan

The plan participants identified opportunities to integrate the 2027–2032 plan into other planning mechanisms, as documented in Table 74.

Table 74: Beaver County Integration of the 2027–2032 Plan

Plan Participant	Description
Beaver County	Beaver County will evaluate mitigation actions during annual monitoring and integrate applicable actions into general and land-use plans, ordinances, development review, infrastructure planning and management, annual budgeting, emergency management, and capital improvement programs. County planning and zoning and building functions, emergency management, road and bridge functions, and finance and budget administration will coordinate this review within their existing responsibilities. At annual monitoring, they will review action status, identify relevant plan or ordinance updates and capital or utility projects, and consider mitigation information during development and investment decisions. The responsible functions will retain records of implementation decisions, including the planning mechanism affected, action or project considered, decision and rationale, funding and timing considerations, and follow-up responsibility.

Plan Participant	Description
	Proposed changes will proceed through applicable local review and approval processes.
Beaver City	Beaver City will evaluate mitigation actions during annual monitoring and integrate applicable actions into general and land-use plans, ordinances, development review, infrastructure planning and management, annual budgeting, emergency management, and capital improvement programs. City administration, planning and zoning, public works and utility functions, and finance and budget administration, in coordination with Beaver County building and emergency management functions will coordinate this review within their existing responsibilities. At annual monitoring, they will review action status, identify relevant plan or ordinance updates and capital or utility projects, and consider mitigation information during development and investment decisions. The responsible functions will retain records of implementation decisions, including the planning mechanism affected, action or project considered, decision and rationale, funding and timing considerations, and follow-up responsibility. Proposed changes will proceed through applicable local review and approval processes.
City of Milford	City of Milford will evaluate mitigation actions during annual monitoring and integrate applicable actions into general and land-use plans, ordinances, development review, infrastructure planning and management, annual budgeting, emergency management, and capital improvement programs. City administration, planning and zoning, public works and utility functions, and finance and budget administration, in coordination with Beaver County building and emergency management functions will coordinate this review within their existing responsibilities. At annual monitoring, they will review action status, identify relevant plan or ordinance updates and capital or utility projects, and consider mitigation information during development and investment decisions. The responsible functions will retain records of implementation decisions, including the planning mechanism affected, action or project considered, decision and rationale, funding and timing considerations, and follow-up responsibility. Proposed changes will proceed through applicable local review and approval processes.
Town of Minersville	Town of Minersville will evaluate mitigation actions during annual monitoring and integrate applicable actions into general and land-use plans, ordinances, development review, infrastructure planning and management, annual budgeting, emergency management, and capital improvement programs. Town administration, local zoning, public works and water-system functions, and finance and budget administration, in coordination with Beaver County building and emergency management functions will coordinate this review within their existing responsibilities. At annual monitoring, they will review action status, identify relevant plan or ordinance updates and capital or utility projects, and consider mitigation information during development and investment decisions. The responsible functions will retain records of implementation decisions, including the planning mechanism affected, action or project considered, decision and rationale, funding and timing considerations, and follow-up responsibility. Proposed changes will proceed through applicable local review and approval processes.

Continued Public Involvement

The plan participants are committed to implementing the plan maintenance process outlined in the base plan. At the same time, they have evaluated their own opportunities to ensure the public has an opportunity to be involved in the plan maintenance and update process. Table 75 shows the **continued public involvement** approach for each plan participant.

Table 75: Continued Public Involvement Approach for Beaver County

Plan Participant	Approach
Beaver County	At least annually, Beaver County will provide opportunities for public input during plan monitoring and review of mitigation-action progress. Public notices and public meetings, the official website, established social media or electronic notification channels where available, and coordination with county emergency communications will announce review opportunities and explain how to submit comments. During future amendments and each five-year update, draft materials will be made available for public review and comment before applicable approval and adoption decisions. Comments may be collected through the advertised electronic methods, written submissions, and public meetings. The responsible local administrative function, in coordination with emergency management and the regional planning team, will retain notices, review dates, draft materials, comments received, and records explaining how comments were considered, including resulting revisions or the rationale for not making a change. If no comments are received, the record will document the opportunity provided and that result.
Beaver City	At least annually, Beaver City will provide opportunities for public input during plan monitoring and review of mitigation-action progress. Public notices and public meetings, the official website, established social media or electronic notification channels where available, and coordination with county emergency communications will announce review opportunities and explain how to submit comments. During future amendments and each five-year update, draft materials will be made available for public review and comment before applicable approval and adoption decisions. Comments may be collected through the advertised electronic methods, written submissions, and public meetings. The responsible local administrative function, in coordination with emergency management and the regional planning team, will retain notices, review dates, draft materials, comments received, and records explaining how comments were considered, including resulting revisions or the rationale for not making a change. If no comments are received, the record will document the opportunity provided and that result.
City of Milford	At least annually, City of Milford will provide opportunities for public input during plan monitoring and review of mitigation-action progress. Public notices and public meetings, the official website, established social media or electronic notification channels where available, and coordination with county emergency communications will announce review opportunities and explain how to submit comments. During future amendments and each five-year update, draft materials will be made available for public review and comment before applicable approval

Plan Participant	Approach
	and adoption decisions. Comments may be collected through the advertised electronic methods, written submissions, and public meetings. The responsible local administrative function, in coordination with emergency management and the regional planning team, will retain notices, review dates, draft materials, comments received, and records explaining how comments were considered, including resulting revisions or the rationale for not making a change. If no comments are received, the record will document the opportunity provided and that result.
Town of Minersville	At least annually, Town of Minersville will provide opportunities for public input during plan monitoring and review of mitigation-action progress. Public notices and public meetings, the official website, established social media or electronic notification channels where available, and coordination with county emergency communications will announce review opportunities and explain how to submit comments. During future amendments and each five-year update, draft materials will be made available for public review and comment before applicable approval and adoption decisions. Comments may be collected through the advertised electronic methods, written submissions, and public meetings. The responsible local administrative function, in coordination with emergency management and the regional planning team, will retain notices, review dates, draft materials, comments received, and records explaining how comments were considered, including resulting revisions or the rationale for not making a change. If no comments are received, the record will document the opportunity provided and that result.

Garfield County Annex

County Profile

This County Profile provides an overview of Garfield County's geographic, demographic, economic, and development characteristics to establish the context for hazard mitigation planning. This section describes the county's physical setting, population and housing trends, economic base, critical infrastructure, and land use patterns, all of which influence vulnerability to natural hazards. Understanding these baseline conditions helps identify where people and assets are located, how the county is developing, and which factors may increase or reduce risk over time. This information supports the hazard identification, vulnerability assessment, capability assessment, and mitigation strategy components of this plan by ensuring that mitigation actions are appropriately tailored to Garfield County and its participating jurisdictions.

Geographic Setting and Communities

Garfield County is a large, rural county in south-central Utah bordered by Beaver, Iron, Kane, Piute, San Juan, and Wayne Counties. The county includes approximately 5,179.6 square miles of land area, making it the fifth-largest county in Utah by land area. It contains the incorporated communities of Antimony, Boulder, Bryce Canyon City, Cannonville, Escalante, Hatch, Henrieville, Panguitch, and Tropic. Its geography includes high plateaus, forested mountain areas, river systems, canyon country, and extensive public lands associated with major recreation destinations such as Bryce Canyon National Park, Capitol Reef National Park, Grand Staircase–Escalante National Monument, and Glen Canyon National Recreation Area/Lake Powell.[178] These geographic conditions shape the county's hazard mitigation context because residents, visitors, transportation routes, utilities, and emergency services are dispersed across long distances and varied terrain.[179]

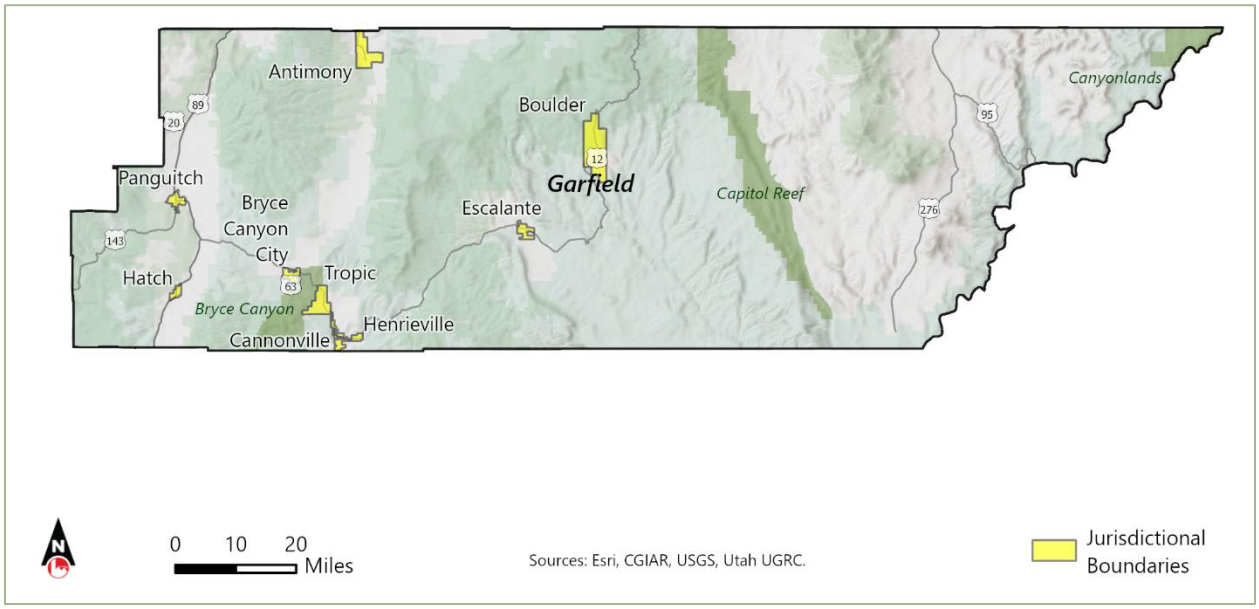


Figure 49: Map of Garfield County and Incorporated Jurisdictions

Population and Housing

The county remains sparsely populated, with a small permanent population spread across a large land area and a housing stock that includes year-round residences, seasonal housing, rental units, and visitor-serving accommodations. The U.S. Census Bureau reports a 2020 Census population of 5,083 and a July 1, 2025 population estimate of 5,256, 3.3% above the 2020 estimates base. The county had an estimated 3,803 housing units in 2025 and approximately 2,042 households in 2020–2024. The owner-occupied housing-unit rate was 70.3%, average household size was 2.42 persons, and persons age 65 or older represented 26.4% of the population in the population estimates. These characteristics inform warning,

[178] Five County Association of Governments Natural Hazard Mitigation Plan, effective 2022–2027.
[179] U.S. Census Bureau, Garfield County, Utah profile, land area and neighboring counties. https://data.census.gov/profile/Garfield_County,_Utah?g=050XX00US49017. Accessed October 9, 2026.

evacuation, sheltering, continuity, and recovery planning for dispersed rural residents, older adults, seasonal residents, and visitors.[180]

Economy and Critical Infrastructure

Garfield County's economy is closely tied to tourism, public lands, agriculture, local government services, and small businesses. Garfield County's Planning and Economic Development Department identifies tourism as a key economic driver, complemented by agriculture and efforts to expand year-round employment and rural economic resilience. Accommodation and food services sales totaled $59.392 million in 2022, retail sales totaled $64.727 million in 2022, and the civilian labor force participation rate for 2020–2024 was 60.1%. Critical infrastructure serving the county includes county and municipal government facilities, schools, public safety and emergency response facilities, Garfield Memorial Hospital in Panguitch, transportation corridors such as U.S. 89 and State Routes 12, 24, 22, and 143, water and wastewater systems, electric and communications networks, bridges, culverts, dams, and visitor-serving facilities. Because infrastructure, services, and destinations are distributed across a large rural geography, disruptions to roads, utilities, communications, healthcare access, or visitor facilities can have countywide consequences during floods, wildfire, winter storms, severe weather, or other hazards.[181]

Land Use, Planning, and Mitigation Context

Garfield County's land use and mitigation context is shaped by its rural settlement pattern, extensive public lands, agricultural and rangeland uses, scenic and recreation resources, and development concentrated in small communities and transportation corridors. The county's Planning Department guides land use, development, zoning, subdivision review, and implementation of county plans, while the Economic Development Office emphasizes sustainable rural growth that preserves natural, agricultural, and community character.[182] Existing planning mechanisms identified for mitigation integration include the Garfield County General Plan, Resource Management Plan, Economic Development Plan, Transportation Master Plan, Moderate Income Housing Plan, Community Wildfire Protection Plan, county code and zoning/subdivision regulations, and floodplain management regulations.[178] For Garfield County, future development and redevelopment should consider wildfire exposure, floodplains and drainage corridors, problem soils, steep slopes, drought and water supply conditions, seismic risk, winter access, and the need to protect community lifelines and critical facilities.

---

[180] U.S. Census Bureau, QuickFacts: Garfield County, Utah, 2020 Census, V2025 population/housing estimates, 2020-2024 ACS, 2022 Economic Census, and 2025 building permits. https://www.census.gov/quickfacts/fact/table/garfieldcountyutah/PST045225. Accessed October 9, 2026.

[181] U.S. Census Bureau, QuickFacts: Garfield County, Utah, 2020 Census, V2025 population/housing estimates, 2020-2024 ACS, 2022 Economic Census, and 2025 building permits. https://www.census.gov/quickfacts/fact/table/garfieldcountyutah/PST045225. Accessed October 9, 2026. Garfield County Planning & Economic Development. https://www.garfield.utah.gov/Departments/Planning-Economic-Development.

[182] Garfield County Planning and Economic Development Department Plan, https://www.garfield.utah.gov/Departments/Planning-Economic-Development.

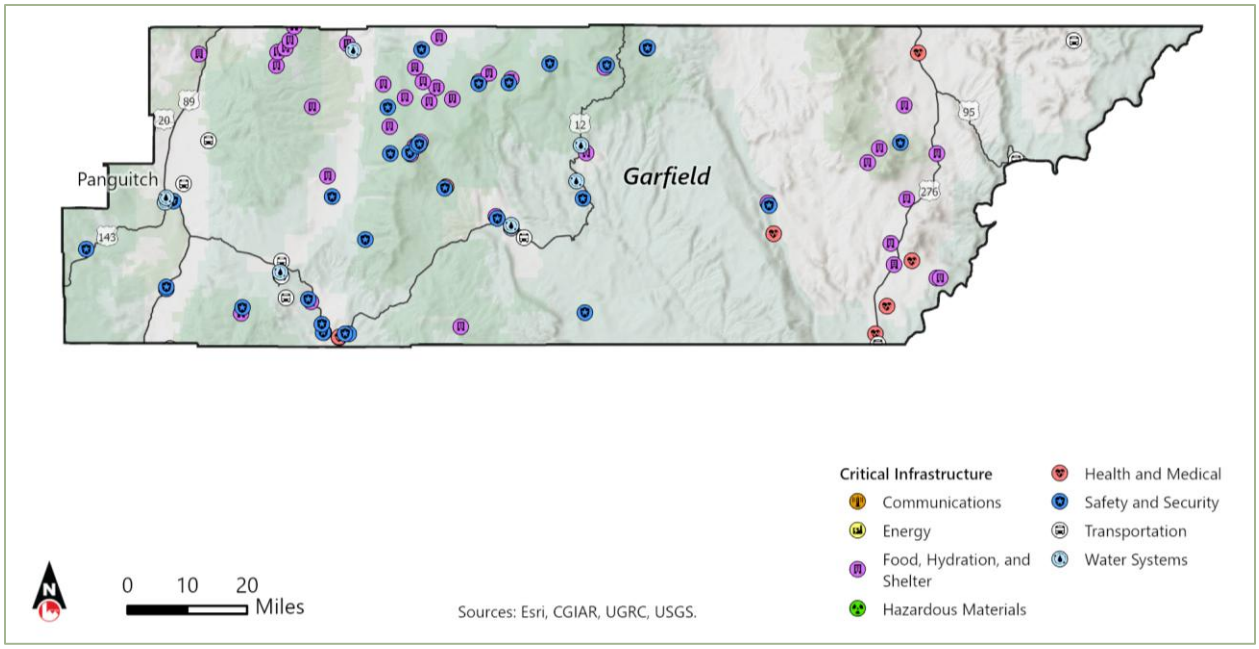


Figure 50: Garfield County Critical Infrastructure Map

Hazard Identification

Each participating jurisdiction considered the hazards profiled for the Five County AOG Region. Table 76 identifies the hazards carried forward for Garfield County, Antimony, Boulder, Bryce Canyon City, Cannonville, Escalante, Hatch, Henrieville, Panguitch, and Tropic. No participant-specific omission is documented in this annex; therefore, each regional hazard is treated as applicable in this assessment.

Table 76: Hazard Applicability for Garfield County Participants

Plan Participant	Hazard	Rationale for Omitting Hazard
Garfield County	Dam Failure, Damaging Winds, Drought, Earthquake, Extreme Heat, Flooding, Hail, Landslide, Problem Soils, Radon Gas, Thunderstorms and Lightning, Tornadoes, Wildfire, Winter Storms	None; no participant-specific hazard omission is documented. All regional hazards are carried forward.
Town of Antimony	Dam Failure, Damaging Winds, Drought, Earthquake, Extreme Heat, Flooding, Hail, Landslide, Problem Soils, Radon Gas, Thunderstorms and Lightning, Tornadoes, Wildfire, Winter Storms	None; no participant-specific hazard omission is documented. All regional hazards are carried forward.
Town of Boulder	Dam Failure, Damaging Winds, Drought, Earthquake, Extreme Heat, Flooding, Hail, Landslide, Problem Soils, Radon	None; no participant-specific hazard omission is documented. All regional hazards are carried forward.

Plan Participant	Hazard	Rationale for Omitting Hazard
	Gas, Thunderstorms and Lightning, Tornadoes, Wildfire, Winter Storms	
Bryce Canyon City	Dam Failure, Damaging Winds, Drought, Earthquake, Extreme Heat, Flooding, Hail, Landslide, Problem Soils, Radon Gas, Thunderstorms and Lightning, Tornadoes, Wildfire, Winter Storms	None; no participant-specific hazard omission is documented. All regional hazards are carried forward.
Town of Cannonville	Dam Failure, Damaging Winds, Drought, Earthquake, Extreme Heat, Flooding, Hail, Landslide, Problem Soils, Radon Gas, Thunderstorms and Lightning, Tornadoes, Wildfire, Winter Storms	None; no participant-specific hazard omission is documented. All regional hazards are carried forward.
City of Escalante	Dam Failure, Damaging Winds, Drought, Earthquake, Extreme Heat, Flooding, Hail, Landslide, Problem Soils, Radon Gas, Thunderstorms and Lightning, Tornadoes, Wildfire, Winter Storms	None; no participant-specific hazard omission is documented. All regional hazards are carried forward.
Town of Hatch	Dam Failure, Damaging Winds, Drought, Earthquake, Extreme Heat, Flooding, Hail, Landslide, Problem Soils, Radon Gas, Thunderstorms and Lightning, Tornadoes, Wildfire, Winter Storms	None; no participant-specific hazard omission is documented. All regional hazards are carried forward.
Town of Henrieville	Dam Failure, Damaging Winds, Drought, Earthquake, Extreme Heat, Flooding, Hail, Landslide, Problem Soils, Radon Gas, Thunderstorms and Lightning, Tornadoes, Wildfire, Winter Storms	None; no participant-specific hazard omission is documented. All regional hazards are carried forward.
Panguitch City	Dam Failure, Damaging Winds, Drought, Earthquake, Extreme Heat, Flooding, Hail, Landslide, Problem Soils, Radon Gas, Thunderstorms and Lightning, Tornadoes, Wildfire, Winter Storms	None; no participant-specific hazard omission is documented. All regional hazards are carried forward.
Town of Tropic	Dam Failure, Damaging Winds, Drought, Earthquake, Extreme Heat, Flooding, Hail, Landslide, Problem Soils, Radon Gas, Thunderstorms and Lightning, Tornadoes, Wildfire, Winter Storms	None; no participant-specific hazard omission is documented. All regional hazards are carried forward.

Vulnerability and Impact Assessment

The vulnerability and impact assessment identifies the people, structures, critical facilities, infrastructure systems, economic activities, natural resources, and other community assets that may be affected by each applicable hazard. Countywide population, housing, facility, and infrastructure figures provide planning context and should not be interpreted as direct hazard exposure unless supported by a mapped footprint, scenario, or documented event. The regional hazard profiles provide hazard characteristics, location, extent, previous occurrences, probability, methodology, and future conditions; this annex supplements those profiles with participant-specific consequences and planning considerations. Facility and infrastructure entries are qualitative planning considerations drawn from the annex inventory. They identify asset types and potential service consequences; they do not represent a verified complete current inventory, a mapped exposure count, or a modeled loss estimate. Inclusion in a county or municipality does not establish that a facility lies within a particular hazard footprint.

The vulnerability assessment identifies the susceptibility of people and community assets to each applicable hazard. The impact assessment describes the potential consequences for those assets and the essential services they support. Together, these assessments inform participant-specific mitigation priorities.

Dam Failure

Table 77 summarizes vulnerabilities and potential impacts associated with dam failure for Garfield County participants.

Table 77: Dam Failure Vulnerability and Impact Assessment for Garfield County

Plan Participant	Vulnerabilities and Impacts
Garfield County	**Vulnerabilities:** Utah Division of Water Rights dam-inventory data provide the source for dam names, locations, hazard-potential classifications, condition, and inspection status. The state dam-safety listing is used for individual dam identification and hazard-potential ratings; no total or classification breakdown from an undated inventory is used here. Hazard-potential classification describes the consequences of failure or misoperation; it does not describe structural condition or probability of failure. County location does not establish direct exposure; inundation mapping or emergency action plans define the relevant downstream areas, which are not quantified in this annex.[183] **Impacts:** A dam failure or emergency release could cause life-safety threats, evacuations, road and bridge closures, damage to homes and public facilities, disruption to utilities and communications, agricultural losses, and damage to

[183] Utah Division of Water Rights, dam-safety inventory listing, retrieved October 10, 2026. https://www.waterrights.utah.gov/damsafety/nid_list. Hazard-potential ratings describe downstream consequences, not dam condition or failure likelihood.

Plan Participant	Vulnerabilities and Impacts
	natural or recreation resources. Critical infrastructure impacts could include Garfield County roads, highways, bridges, drainage infrastructure, landfill and solid waste operations, public safety facilities, the Garfield County Sheriff's Office and Jail in Panguitch, schools, Garfield Memorial Hospital, water and wastewater systems, and visitor-serving facilities along U.S. 89, State Route 12, State Route 24, State Route 22, and State Route 143. The 2024 Panguitch Lake Dam incident demonstrated that Garfield County may experience emergency warning, evacuation planning, roadway closure, reservoir drawdown, and dam stabilization needs even when a breach is prevented. Rapid inundation, erosion, debris, roadway washout, agricultural losses, and temporary isolation downstream are also possible. Consequences depend on the affected dam, failure mode, warning time, reservoir level, downstream development, and exposed assets. Roads, bridges, culverts, utilities, irrigation systems, emergency facilities, residences, agricultural operations, recreation assets, and other facilities are directly exposed only where they lie within a documented downstream inundation area.[184]
Town of Antimony	**Vulnerabilities:** The Town of Antimony is vulnerable to dam failure where residents, local roads, utilities, agricultural lands, ranch infrastructure, and structures are located downstream of dams or along drainage corridors that could receive sudden flood flows. The town's small staff capacity, reliance on volunteer elected leadership, county law enforcement, and regional utility providers may increase vulnerability if warning, evacuation, access, or service restoration is needed. **Impacts:** Potential impacts include life-safety risks for people in low-lying or downstream areas, temporary evacuations, road washouts or closures, damage to homes and outbuildings, disruption of electric and communications service, and losses to agricultural or ranching assets. Critical infrastructure impacts could include Antimony's community center/town meeting location, water system repair needs, local roads and stop-sign/traffic controls, the post office, landfill-related operations, and the Antimony Volunteer Fire Department/fire station area. If access routes are affected, response and restoration may be delayed because outside agencies and service providers must reach the community from elsewhere in the county.
Town of Boulder	**Vulnerabilities:** The Town of Boulder is vulnerable to dam failure where homes, businesses, public facilities, local roads, utilities, and visitor-serving assets are located near downstream channels or canyon corridors that could experience rapid, high-velocity flows. The town's remote setting, limited redundancy in access routes, volunteer emergency services, and reliance on

[184] Utah Department of Public Safety, Panguitch Lake Dam incident updates, April 2024. https://dps.utah.gov/news/panguitch-lake-dam-updated-4-15-24/. Utah Division of Water Rights, State Approves Panguitch Lake Dam Reconstruction Following-up on 2024 Emergency, July 14, 2025. https://waterrights.utah.gov/pressRelease/Panguitch-Dam-Rebuilds-a-Year-Later-News-Release.pdf. The incident was stabilized; controlled releases produced some surface flooding in low-lying pastures and corrals.

Plan Participant	Vulnerabilities and Impacts
	county law enforcement may increase vulnerability during warning, evacuation, response, and restoration. **Impacts:** A dam failure or emergency release could damage roads, bridges, utilities, homes, public facilities, and recreation access routes; isolate residents or visitors; disrupt power and communications; and delay emergency response if debris or flooding affects local roads. Critical infrastructure impacts could include Boulder Town facilities, the Boulder Volunteer Fire Department at 55 East 300 North, volunteer emergency medical response, the Town of Boulder Water Department, Rocky Mountain Power service, landfill and cemetery access, and Scenic Byway 12/recreation access routes. Impacts may be greater where floodwater moves through narrow channels before spreading into developed or traveled areas.
Bryce Canyon City	**Vulnerabilities:** Bryce Canyon City is vulnerable to dam failure where public facilities, lodging, roads, utilities, workers, residents, and visitors could be affected by downstream flooding, emergency releases, or access disruptions. Because the city supports visitor activity near Bryce Canyon National Park, disruption to transportation corridors, utilities, and lodging or service facilities may affect both residents and a seasonal visitor population. **Impacts:** Potential impacts include evacuation needs, road closures, utility interruptions, damage to public or visitor-serving facilities, and disruptions to tourism-related operations. Critical infrastructure impacts could include the Bryce Canyon City Public Safety Building and Fire Department, Garfield County ambulance presence, search and rescue vehicles, mass-casualty trailer, winter mobile clinic space used by Garfield Memorial Hospital, sewer and water systems, roads, shuttle station, wellness center, lodging, RV parks, campgrounds, auto care/fuel services, and access to Bryce Canyon National Park. If flooding or emergency response conditions affect access routes, impacts could extend to visitor movement, lodging operations, emergency access, and coordination with county and regional service providers.
Town of Cannonville	**Vulnerabilities:** The Town of Cannonville is vulnerable to dam failure where residences, town facilities, roads, utilities, and nearby agricultural or ranching assets are located downstream of dams or in areas that could receive rapid flood flows. The town's rural setting, limited local administrative capacity, county-provided law enforcement, and reliance on regional electric and communications providers may increase vulnerability to warning, evacuation, outage, and restoration challenges. **Impacts:** Dam failure or emergency release could threaten people in downstream areas, damage homes, public facilities, roads, culverts, bridges, outbuildings, fences, and utility infrastructure, and disrupt power or communications. Critical infrastructure impacts could include Cannonville's town facilities, public water system serving residential, commercial, industrial, and institutional connections, local roads and drainage crossings, nearby agricultural/ranching infrastructure, and visitor routes used as a base camp for Bryce Canyon and surrounding recreation. Flooding or debris may also affect

Plan Participant	Vulnerabilities and Impacts
	access for emergency response, service restoration, agricultural operations, and movement between Cannonville and nearby communities or recreation routes.
City of Escalante	**Vulnerabilities:** The City of Escalante is vulnerable to dam failure where residents, businesses, roads, public facilities, utilities, and visitor-serving assets are located downstream of dams or along flood-prone channels. The city has planning and zoning functions, county law enforcement support, and regional utility service, but homes, commercial areas, public buildings, roads, and utility systems remain susceptible to sudden flooding and service disruption. **Impacts:** Potential impacts include life-safety risks, evacuations, road and bridge damage, power and communication outages, damage to homes and businesses, and interruption of local government, emergency response, fuel access, lodging, and recreation travel. Critical infrastructure impacts could include Escalante City Offices, Escalante Fire Department at 75 North Main/Center, Escalante Municipal Airport, Escalante Public Library/Art Center, Senior Citizens Center, city water, sewer, and building permit services, the post office, Garkane Energy, South Central Communications, Escalante Petrified Forest State Park, and the Escalante Interagency Visitor Center. Flooding could also affect agricultural lands, natural resources, and access to public lands or scenic routes used by residents and visitors.
Town of Hatch	**Vulnerabilities:** The Town of Hatch is vulnerable to dam failure where homes, local roads, utilities, propane service access, communications, agricultural facilities, and recreation travel routes are located downstream of dams or within flood pathways. The town's rural setting, reliance on volunteer elected leadership, county-provided law enforcement, and regional electric and fuel providers may increase vulnerability if evacuation, access, or service restoration is required. **Impacts:** A dam failure or emergency release could require warning and evacuation, damage roads, culverts, bridges, homes, outbuildings, fences, and utility lines, and disrupt electricity, communications, and fuel access. Critical infrastructure impacts could include Hatch Town Hall/community center at 49 West Center, Hatch Town Water System, Hatch Volunteer Fire Department, Hatch Irrigation Company facilities, U.S. 89 passing-lane and travel corridor improvements, propane/fuel access, and town roads, parks, cemetery, and public facilities. Travel disruptions may affect residents and visitors moving through the area, and flood damage could delay emergency response or restoration where outside providers must access the community.
Town of Henrieville	**Vulnerabilities:** The Town of Henrieville is vulnerable to dam failure where residents, local roads, utilities, community facilities, and agricultural or ranching assets are located downstream of dams or along drainage corridors. The town's small size, limited local administrative capacity, county law enforcement support, and regional utility service may increase vulnerability to warning, evacuation, outage, and access challenges.

Plan Participant	Vulnerabilities and Impacts
	Impacts: Potential impacts include life-safety threats, evacuation needs, damage to homes, outbuildings, roads, culverts, bridges, fences, and utility lines, and interruptions to electric or communications service. Critical infrastructure impacts could include Henrieville Town Office/Town Hall at 70 Main Street, Henrieville Volunteer Fire Department, Henrieville Town Culinary Water system, Henrieville Irrigation Company facilities, local roads and drainage crossings, community facilities, agricultural/ranching infrastructure, and utility and communications service. Flooding or debris could affect ranching and agricultural operations and delay emergency response or repairs if access routes are damaged or blocked.
Panguitch City	**Vulnerabilities:** The Panguitch City is highly vulnerable to dam failure because the 2024 Panguitch Lake Dam incident required emergency action plan activation, reservoir drawdown, State Route 143 closure, public notification, evacuation area identification, and dam stabilization efforts. Vulnerable assets include residents, homes, schools, municipal services, streets, utilities, emergency response facilities, public buildings, businesses, and transportation routes located downstream or dependent on access through affected corridors. **Impacts:** A dam failure or emergency release could result in life-safety risks, evacuations, damage to homes and public facilities, road and bridge closures, utility interruptions, disruption of city services, and business interruption. Critical infrastructure impacts could include Panguitch City Hall at 25 South 200 East, City Services and Public Works, the Utility Department, Panguitch City Planning and Zoning functions, Panguitch Municipal Airport, Panguitch Fire Department, Garfield County Sheriff's Office, Garfield County Ambulance, Garfield County Courthouse and Justice Court facilities, Garfield Memorial Hospital and local health services, schools, U.S. 89, State Route 143, city streets, water and wastewater systems, communications, power service, and visitor-serving businesses. The 2024 incident showed that even a potential failure can require coordinated warning, public meetings, law enforcement involvement, road closure, reservoir management, and construction response to prevent downstream damage.
Town of Tropic	**Vulnerabilities:** The Town of Tropic is vulnerable to dam failure where homes, businesses, town facilities, roads, utilities, communications, waste service access, fuel and propane service, and visitor-serving assets are located downstream of dams or within flood pathways. The town's connection to nearby recreation and park destinations increases exposure for both residents and visitors if flooding or emergency access disruptions occur. **Impacts:** Dam failure or emergency release could require evacuation, damage homes, businesses, town facilities, roads, culverts, bridges, fences, and utility lines, and interrupt power, communications, waste service, and fuel or propane access. Critical infrastructure impacts could include Tropic Town Office at 20 North Main Street, Heritage Center/Town Council Room, senior/community/wellness center, water and sewer systems, roads and streets, maintenance shed/yard, town park/scout house, fire department

Plan Participant	Vulnerabilities and Impacts
	functions, irrigation company facilities, local businesses, visitor-serving facilities, fuel or propane access, and routes connecting Tropic with Bryce Canyon-area recreation destinations. Flooding or debris could also affect emergency response, local businesses, and visitor travel associated with nearby recreation and park destinations.

Damaging Winds

Table 78 summarizes vulnerabilities and potential impacts associated with damaging winds for Garfield County participants.

Table 78: Damaging Winds Vulnerability and Impact Assessment for Garfield County

Plan Participant	Vulnerabilities and Impacts
Garfield County	**Vulnerabilities:** Garfield County is vulnerable to damaging winds across exposed plateaus, open valleys, canyon corridors, and higher-elevation areas where terrain funneling can increase wind speeds. Countywide vulnerabilities include dispersed residences and seasonal housing, public facilities, schools, emergency service facilities, long utility and communication lines, agricultural and ranching assets, and tourism and recreation infrastructure connected to Bryce Canyon, Grand Staircase-Escalante, and Lake Powell travel patterns. **Impacts:** Damaging winds can cause roof and siding damage, broken windows, damage to signs and outbuildings, downed trees and debris, power and communication outages, roadway hazards, and disruptions to emergency access, visitor travel, agricultural operations, and local businesses. Specific critical infrastructure at risk includes county road and drainage systems maintained by Garfield County Public Works, the Garfield County Sheriff's Office/Jail, schools, Garfield Memorial Hospital, fire and EMS facilities, public buildings, water/wastewater systems, communication lines, power distribution systems, and visitor-serving facilities along major corridors and park gateway areas. Localized events may have countywide consequences where communities rely on limited access routes, long utility corridors, and destination travel.
Town of Antimony	**Vulnerabilities:** The Town of Antimony is vulnerable to damaging winds due to its rural setting, limited local staffing capacity, reliance on volunteer elected leadership, county-provided law enforcement, and utility service from regional providers. Homes, outbuildings, local roads, overhead utilities, communications service, agricultural facilities, fences, and ranch infrastructure are exposed to wind, debris, and service interruptions. **Impacts:** Damaging winds could damage roofs, siding, sheds, barns, fences, signs, and utility lines; create debris on local roads; interrupt electric or communication service; and delay response where county or regional service providers must access the community from outside the town. Critical

Plan Participant	Vulnerabilities and Impacts
	infrastructure impacts could include Antimony's community center/town meeting location, town water system components, local road network, post office, landfill operations, and Antimony Volunteer Fire Department/fire station. Agricultural and ranching operations may also experience damage to lightweight structures, fencing, equipment storage, and other exposed assets.
Town of Boulder	**Vulnerabilities:** The Town of Boulder is vulnerable to damaging winds because it is located in exposed and complex terrain where canyon and plateau conditions can intensify wind effects. Vulnerable assets include residences, small businesses, public facilities, local roads, visitor-serving facilities, utilities, volunteer emergency services, and transportation routes used by residents and visitors. **Impacts:** Damaging winds could cause roof, siding, window, sign, and outbuilding damage; down trees or debris onto roads; interrupt power and communications; and create hazardous travel conditions along local and scenic routes. Critical infrastructure impacts could include Boulder Town facilities, Boulder Volunteer Fire Department, volunteer EMT functions, Town of Boulder Water Department, Rocky Mountain Power service, landfill and cemetery access, and Scenic Byway 12/recreation access routes. Because the town relies on volunteer emergency services and county law enforcement, blocked roads or utility outages could delay response and restoration.
Bryce Canyon City	**Vulnerabilities:** Bryce Canyon City is vulnerable to damaging winds due to its visitor-serving setting near Bryce Canyon National Park, reliance on utility service from regional providers, and exposure of lodging, public facilities, roads, utilities, and tourism-related infrastructure to high winds and debris. **Impacts:** Damaging winds could damage roofs, siding, signs, windows, utility lines, and other exposed structures; disrupt power and communications; and create hazardous travel conditions for residents, workers, and visitors. Critical infrastructure impacts could include Bryce Canyon City's Public Safety Building and Fire Department, fire engine, ambulance, mass-casualty trailer, search and rescue vehicles, sewer and water systems, roads, shuttle station, wellness center, lodging, RV parks, campgrounds, auto care/fuel services, and access to Bryce Canyon National Park. Impacts to lodging, park-support activity, and access roads could affect tourism operations and emergency access during peak visitation periods.
Town of Cannonville	**Vulnerabilities:** The Town of Cannonville is vulnerable to damaging winds because residences, town facilities, local roads, overhead utilities, communications service, and nearby agricultural or ranching assets are located in an exposed rural setting. The town's reliance on volunteer elected leadership, county-provided law enforcement, and regional utility and communication providers may increase sensitivity to outages or access disruptions. **Impacts:** Damaging winds could damage homes, roofs, outbuildings, fences, signs, and utility lines; scatter debris onto local roads; interrupt electric or communication service; and delay response or repair where outside agencies

Plan Participant	Vulnerabilities and Impacts
	or providers must reach the community. Critical infrastructure impacts could include Cannonville town facilities, the town water system, local roads and drainage crossings, utility and communications infrastructure, agricultural/ranching infrastructure, and visitor-serving travel routes connected to Bryce Canyon and surrounding recreation. Agricultural and ranching assets may also experience damage to lightweight structures, fencing, and equipment storage areas.
City of Escalante	**Vulnerabilities:** The City of Escalante is vulnerable to damaging winds because residences, businesses, public facilities, utilities, and transportation routes are located in an exposed setting connected to regional recreation and visitor travel. The city's planning and zoning functions, county-provided law enforcement, and utility services are important local capabilities, but overhead utilities, roads, signs, older or lightweight structures, and visitor-serving facilities remain susceptible to wind damage. **Impacts:** Damaging winds could cause roof and siding damage, broken windows, sign damage, downed utility lines, debris on roads, temporary power or communication outages, and unsafe travel conditions. Critical infrastructure impacts could include Escalante City Offices, Escalante Fire Department, Escalante Municipal Airport, Escalante Public Library/Art Center, Senior Citizens Center, city water and sewer systems, post office, Garkane Energy, South Central Communications, Escalante Petrified Forest State Park, and the Escalante Interagency Visitor Center. Disruptions may affect residents, emergency response, local businesses, lodging, fuel access, and recreation travel associated with nearby scenic routes and public lands.
Town of Hatch	**Vulnerabilities:** The Town of Hatch is vulnerable to damaging winds due to its rural setting, reliance on volunteer elected leadership and county-provided law enforcement, and dependence on regional electric and fuel providers. Residences, local roads, overhead utilities, communications, propane service access, agricultural facilities, and nearby recreation travel routes are exposed to wind, debris, and service disruption. **Impacts:** Damaging winds could damage roofs, siding, signs, sheds, barns, fences, and utility lines; create debris hazards on local roads; interrupt electricity, communications, and fuel access; and delay emergency response or restoration. Critical infrastructure impacts could include Hatch Town Hall/community center, Hatch Town Water System, Hatch Volunteer Fire Department, Hatch Irrigation Company facilities, U.S. 89 travel corridor, propane/fuel access, town roads, parks, cemetery, and public facilities. Travel disruptions may affect residents and visitors moving through the area toward nearby recreation destinations.
Town of Henrieville	**Vulnerabilities:** The Town of Henrieville is vulnerable to damaging winds because local residences, roads, utilities, and community facilities are located in a small rural community with limited local administrative capacity and reliance on county law enforcement and regional utility service. Overhead

Plan Participant	Vulnerabilities and Impacts
	electric lines, communications, outbuildings, fences, and agricultural or ranching assets are particularly susceptible to wind and debris impacts. **Impacts:** Damaging winds could damage homes, roofs, siding, signs, outbuildings, fences, and utility lines; cause debris hazards on local roads; interrupt electric or communication service; and delay response or repairs where outside support is needed. Critical infrastructure impacts could include Henrieville Town Office/Town Hall, Henrieville Volunteer Fire Department, Henrieville Town Culinary Water system, Henrieville Irrigation Company facilities, local roads, community facilities, utility and communications infrastructure, and agricultural/ranching assets. Impacts to ranching and agricultural assets may include damage to fencing, lightweight structures, and storage areas.
Panguitch City	**Vulnerabilities:** The Panguitch City is vulnerable to damaging winds because it contains the county seat, a concentration of residents and housing, public facilities, schools, city services, utilities, streets, and emergency service assets. Vulnerable assets include homes, older or lightweight structures, municipal facilities, utility systems, transportation routes, businesses, and visitor-serving facilities. **Impacts:** Damaging winds could cause roof, siding, window, sign, fence, and outbuilding damage; down utility lines; interrupt power, communications, water-related operations, local government services, and emergency response; and create debris or reduced-visibility hazards on local and regional roads. Critical infrastructure impacts could include Panguitch City Hall, City Services and Public Works, Utility Department, Panguitch Municipal Airport, Panguitch Fire Department, Garfield County Sheriff's Office, Garfield County Ambulance, Garfield County Courthouse and Justice Court facilities, Garfield Memorial Hospital and local health services, schools, U.S. 89, State Route 143, city streets, communications, power service, visitor center/service businesses, and water and wastewater infrastructure. Business interruption, public facility damage, cleanup costs, and disruptions to residents and visitors could be greater in Panguitch because of its concentration of services and population within the county.
Town of Tropic	**Vulnerabilities:** The Town of Tropic is vulnerable to damaging winds because residences, town facilities, local roads, utility services, communications, waste service, and visitor-serving assets are located near travel routes and recreation destinations. Vulnerable assets include homes, businesses, signs, roofs, outbuildings, overhead utilities, fuel and propane service access, and infrastructure that supports residents and visitors. **Impacts:** Damaging winds could damage roofs, siding, windows, signs, fences, sheds, utility lines, and other exposed structures; interrupt power, communications, waste service access, and fuel or propane availability; and create debris hazards or unsafe travel conditions. Critical infrastructure impacts could include Tropic Town Office, Heritage Center/Town Council Room, senior/community/wellness center, water and sewer systems, roads

Plan Participant	Vulnerabilities and Impacts
	and streets, maintenance shed/yard, town park/scout house, fire department functions, irrigation company facilities, local businesses, visitor-serving facilities, and routes connecting Tropic with Bryce Canyon-area recreation destinations. Disruptions could affect residents, local businesses, emergency access, and visitor travel associated with nearby recreation and park destinations.

Drought

Table 79 summarizes vulnerabilities and potential impacts associated with drought for Garfield County participants.

Table 79: Drought Vulnerability and Impact Assessment for Garfield County

Plan Participant	Vulnerabilities and Impacts
Garfield County	**Vulnerabilities:** Garfield County is vulnerable to drought countywide because prolonged precipitation deficits, reduced snowpack, earlier runoff, lower streamflow, and stressed groundwater or spring-fed supplies can affect residents, agriculture, rangelands, municipal and domestic water systems, recreation areas, and tourism-dependent landscapes. The 2022 Census of Agriculture reports 297 farms on 85,397 acres, including 15,721 irrigated acres. These water-dependent agricultural assets may experience water and forage limitations during drought; the inventory is not a dated measure of drought severity or of residents affected.[185] **Impacts:** Drought can reduce crop and forage productivity, increase feed and operating costs for ranchers and farmers, stress livestock water supplies, reduce streamflow and soil moisture, affect municipal and domestic water reliability, degrade habitat and recreation conditions, and increase wildfire potential, smoke, and windblown dust. Critical infrastructure impacts could include public water systems, irrigation systems, wells and springs, Garfield County roads and dust-prone unpaved routes, county public facilities, schools, Garfield Memorial Hospital, fire protection water supply, campgrounds, visitor destinations, grazing allotments, and utility systems that rely on reliable water and power. Because drought is slow-onset and hydrologic recovery can lag, impacts may persist for months or years after precipitation improves.
Town of Antimony	**Vulnerabilities:** The Town of Antimony is vulnerable to drought because residents, domestic water users, agricultural lands, ranching operations, livestock, rangelands, and local utility-dependent services may be affected by

[185] USDA National Agricultural Statistics Service, 2022 Census of Agriculture, Garfield County, Utah county profile, pages 1-2. https://www.nass.usda.gov/Publications/AgCensus/2022/Online_Resources/County_Profiles/Utah/cp49017.pdf. Figures describe countywide agriculture, not mapped hazard exposure.

Plan Participant	Vulnerabilities and Impacts
	reduced precipitation, soil moisture deficits, reduced forage, and limited water availability. The town's rural setting, limited local administrative capacity, county-provided law enforcement, and reliance on regional utility and communication providers may increase sensitivity to prolonged drought response and service disruptions. **Impacts:** Drought could reduce forage and crop productivity, increase feed and water costs for ranching operations, stress domestic or small-community water supplies, increase dust and wildfire potential, and affect residents who depend on reliable water service. Prolonged drought may also place additional pressure on local leadership and county or regional partners to support conservation messaging, emergency response, and recovery needs.
Town of Boulder	**Vulnerabilities:** The Town of Boulder is vulnerable to drought because residents, small businesses, visitor-serving uses, local water supplies, rangelands, vegetation, and recreation-oriented landscapes may be affected by reduced snowpack, lower runoff, soil moisture loss, and stressed groundwater or spring-fed supplies. The town's remote setting and dependence on limited access routes and volunteer emergency services may increase vulnerability when drought contributes to wildfire potential, degraded air quality, or water supply concerns. **Impacts:** Drought could reduce local water reliability, stress vegetation and rangelands, degrade recreation and scenic resources, increase wildfire potential, and contribute to smoke or dust impacts. Critical infrastructure impacts could include the Town of Boulder Water Department, public facilities, Boulder Volunteer Fire Department water supply needs, local roads, campgrounds, trailheads, Scenic Byway 12 access, Rocky Mountain Power service, and small businesses dependent on visitor activity. These conditions may affect residents, small businesses, visitor activity, emergency response demands, and the town's ability to maintain services during prolonged dry periods.
Bryce Canyon City	**Vulnerabilities:** Bryce Canyon City is vulnerable to drought because residents, workers, lodging, public facilities, visitor-serving businesses, utilities, and nearby recreation landscapes depend on reliable water supplies and healthy natural resources. Reduced snowpack, lower runoff, dry vegetation, and wildfire potential can affect the city's visitor-serving economy and regional access to Bryce Canyon-area destinations. **Impacts:** Drought could increase water conservation needs, stress landscaping and local vegetation, reduce recreation quality, elevate wildfire and smoke risk, and affect tourism-related operations that depend on reliable water and safe outdoor conditions. Critical infrastructure impacts could include Bryce Canyon City water and sewer systems, lodging and RV park water demand, Public Safety Building operations, fire protection water supply, shuttle station, wellness center, campgrounds, auto care/fuel services, and access to Bryce Canyon National Park. Prolonged drought could also increase

Plan Participant	Vulnerabilities and Impacts
	operating costs for public facilities and lodging while placing added demand on regional utility and emergency response partners.
Town of Cannonville	**Vulnerabilities:** The Town of Cannonville is vulnerable to drought because residences, town facilities, small-community water needs, agricultural and ranching assets, rangelands, and nearby recreation travel corridors may be affected by reduced precipitation, soil moisture deficits, diminished forage, and stressed local water supplies. The town's limited local administrative capacity and reliance on county law enforcement and regional utility providers may increase vulnerability during prolonged drought conditions. **Impacts:** Drought could reduce forage quality, increase livestock water and feed costs, stress domestic and municipal water availability, increase dust and wildfire potential, and affect nearby recreation and visitor travel conditions. Critical infrastructure impacts could include Cannonville's public water system, residential, commercial, industrial, and institutional water connections, town facilities, local roads, drainage crossings, agricultural/ranching infrastructure, and visitor routes used by residents and travelers. Prolonged dry conditions may also increase demand for public messaging, conservation coordination, and emergency response support from county and regional partners.
City of Escalante	**Vulnerabilities:** The City of Escalante is vulnerable to drought because residents, businesses, public facilities, agricultural and ranching operations, visitor-serving uses, and water-dependent community systems may be affected by reduced snowpack, lower runoff, soil moisture deficits, and stressed groundwater or spring-fed supplies. The city's recreation and public lands travel setting increases sensitivity to drought-related landscape stress, wildfire potential, dust, and degraded outdoor conditions. **Impacts:** Drought could reduce water reliability for residents, businesses, public facilities, and visitor-serving uses; increase conservation needs; reduce forage and agricultural productivity; increase feed and operating costs for producers; and contribute to wildfire, smoke, and dust impacts. Critical infrastructure impacts could include Escalante City water and sewer systems, City Offices, Escalante Fire Department water supply needs, Escalante Municipal Airport, public library/art center, Senior Citizens Center, fuel access, lodging, utilities, and recreation/public lands access points. Prolonged drought could also affect lodging, fuel access, recreation travel, and local businesses that rely on safe outdoor conditions and reliable utility service.
Town of Hatch	**Vulnerabilities:** The Town of Hatch is vulnerable to drought because residents, local water users, agricultural and ranching assets, livestock, rangelands, and nearby recreation travel routes may be affected by reduced precipitation, lower runoff, soil moisture deficits, reduced forage, and limited water availability. The town's rural setting and reliance on volunteer leadership, county law enforcement, regional electric providers, and fuel providers may increase sensitivity to prolonged drought response and service coordination needs.

Plan Participant	Vulnerabilities and Impacts
	Impacts: Drought could stress domestic water availability, reduce forage quality, increase feed and livestock water costs, affect agricultural production, increase wildfire potential, and contribute to dust or degraded air quality. Critical infrastructure impacts could include the Hatch Town Water System, Hatch Irrigation Company, town facilities at 49 West Center, Hatch Volunteer Fire Department fire protection water needs, local roads, U.S. 89, propane/fuel access, parks, and agricultural/ranching infrastructure. These impacts may affect residents, ranching operations, visitor travel, emergency response demand, and the town's ability to coordinate conservation or response activities during extended dry periods.
Town of Henrieville	**Vulnerabilities:** The Town of Henrieville is vulnerable to drought because residents, local water users, community facilities, agricultural and ranching assets, livestock, rangelands, and vegetation may be affected by reduced precipitation, lower soil moisture, reduced forage, and stressed water supplies. The town's small size, limited local administrative capacity, county law enforcement support, and reliance on regional utility service may increase vulnerability during prolonged drought conditions. **Impacts:** Drought could reduce forage and agricultural productivity, increase feed and water costs for livestock operations, stress domestic water availability, increase wildfire potential, and contribute to dust, smoke, or degraded habitat conditions. Critical infrastructure impacts could include Henrieville Town Culinary Water system, Henrieville Irrigation Company facilities, Henrieville Town Office/Town Hall, Henrieville Volunteer Fire Department water supply needs, local roads, community facilities, agricultural/ranching infrastructure, and utility service. Prolonged drought may increase demand for conservation messaging, emergency response coordination, and support from county or regional partners.
Panguitch City	**Vulnerabilities:** The Panguitch City is vulnerable to drought because it contains the county seat, a concentration of residents and housing, municipal services, schools, public facilities, businesses, water systems, streets, and emergency service assets that depend on reliable water supplies. The city is also connected to surrounding agricultural, ranching, recreation, and tourism activity that may be affected by reduced snowpack, lower runoff, diminished forage, stressed vegetation, and increased wildfire potential. **Impacts:** Drought could stress municipal and domestic water supplies, increase conservation needs, affect landscaping and public facilities, reduce agricultural and forage productivity, increase ranching costs, and elevate wildfire, smoke, and dust risks. Critical infrastructure impacts could include Panguitch City water and utility systems, City Hall, City Services and Public Works, Utility Department, Panguitch Fire Department, Garfield Memorial Hospital and local health services, schools, Panguitch Municipal Airport, city streets, U.S. 89, State Route 143, public buildings, communications, power service, visitor-serving businesses, and agricultural/ranching support systems. Because Panguitch concentrates county services and residents, prolonged

Plan Participant	Vulnerabilities and Impacts
	drought could also increase demands on local government operations, emergency response, public messaging, and business continuity.
Town of Tropic	**Vulnerabilities:** The Town of Tropic is vulnerable to drought because residences, town facilities, local businesses, utility-dependent services, fuel and propane access, waste service, visitor-serving assets, nearby rangelands, and recreation-oriented landscapes may be affected by reduced precipitation, lower runoff, soil moisture loss, stressed vegetation, and limited water availability. The town's connection to nearby recreation and park destinations increases exposure for residents, businesses, and visitors during prolonged dry periods. **Impacts:** Drought could increase water conservation needs, stress vegetation and local water supplies, reduce forage quality, increase ranching costs, elevate wildfire potential, and contribute to smoke, dust, or degraded outdoor recreation conditions. Critical infrastructure impacts could include Tropic Town Water System, sewer system, Town Office, Heritage Center/Town Council Room, senior/community/wellness center, roads and streets, maintenance shed/yard, fire department functions, irrigation company facilities, town park/scout house, local businesses, visitor-serving facilities, and routes serving Bryce Canyon-area recreation. These impacts could affect residents, town operations, local businesses, visitor travel, fuel and service access, and emergency response demand during extended drought conditions.

Earthquake

Table 80 summarizes vulnerabilities and potential impacts associated with earthquake for Garfield County participants.

Table 80: Earthquake Vulnerability and Impact Assessment for Garfield County

Plan Participant	Vulnerabilities and Impacts
Garfield County	**Vulnerabilities:** Garfield County is vulnerable to earthquakes countywide because damaging ground shaking is possible during regional earthquakes. Vulnerable assets include residents, older and unreinforced masonry structures, schools and public buildings, emergency response facilities, roads and bridges, utilities, communications systems, water and wastewater systems, businesses, historic resources, recreation areas, and visitor-serving facilities. Older or unreinforced masonry school buildings and additions can be vulnerable where structural retrofit or replacement has not reduced susceptibility to shaking; this assessment does not establish the current structural condition of named schools. **Impacts:** Earthquakes could cause structural and nonstructural building damage, injuries from falling objects or damaged buildings, disruption to

Plan Participant	Vulnerabilities and Impacts
	roads, bridges, utilities, communications, water, wastewater, government services, schools, and emergency response, and damage to historic or cultural resources. Critical infrastructure impacts could include Garfield County Public Works roads, highways, bridges, drainage infrastructure, the Garfield County Courthouse, Sheriff's Office/Jail, Garfield County Ambulance District, Garfield Memorial Hospital, schools including Panguitch and Escalante school facilities, public safety facilities, water and wastewater systems, power distribution, communications, county landfill and solid waste operations, Bryce Canyon Airport, Panguitch Municipal Airport, and visitor-serving facilities along U.S. 89, SR-12, SR-24, SR-22, SR-63, and SR-143. Secondary impacts may include landslides, rockfall, liquefaction in susceptible areas, hazardous materials releases, business interruption, visitor access disruptions, and delayed response in remote communities with limited redundant routes.
Town of Antimony	**Vulnerabilities:** The Town of Antimony is vulnerable to earthquakes because residents, homes, local roads, utilities, communications service, agricultural and ranching structures, and community functions may be exposed to countywide ground shaking. The earthquake profile documents past moderate earthquakes near Antimony, including events recorded southeast and west of the town. The town's small administrative capacity, volunteer elected leadership, county-provided law enforcement, and reliance on regional utility and communication providers may increase vulnerability if access, service restoration, or emergency response is disrupted. **Impacts:** Earthquake impacts could include damage to older homes, outbuildings, utility connections, roads, and bridges; injuries from falling objects or damaged structures; power and communication outages; and interruption of ranching, agricultural, and daily community activities. Critical infrastructure impacts could include Antimony's community center/town meeting location, local water system components, the Antimony Volunteer Fire Department/fire station area, post office, local road network, landfill-related operations, regional electric and communications service, and agricultural/ranching infrastructure. If roads are damaged or blocked, county law enforcement, emergency response, and utility repair may be delayed.
Town of Boulder	**Vulnerabilities:** The Town of Boulder is vulnerable to earthquakes because residences, small businesses, public facilities, local roads, utilities, visitor-serving assets, and emergency service functions may be exposed to countywide ground shaking. The earthquake profile identifies a past moderate earthquake northeast of Boulder, and the town's canyon and slope-adjacent setting may increase exposure to secondary hazards such as rockfall, landslides, or road blockage. The town's remote location, limited redundant access, volunteer emergency services, and county law enforcement support may increase vulnerability if transportation or utility systems are damaged. **Impacts:** Earthquakes could damage homes, businesses, public facilities, roads, bridges, utility lines, and communications systems; create rockfall or landslide hazards; and disrupt emergency response, visitor access, and daily community functions. Critical infrastructure impacts could include Boulder

Plan Participant	Vulnerabilities and Impacts
	Town facilities, Boulder Volunteer Fire Department, volunteer EMT functions, Town of Boulder Water Department, Rocky Mountain Power service, local roads, landfill and cemetery access, campgrounds, trailheads, Scenic Byway 12, and recreation access routes. If access routes are blocked or lifelines are damaged, residents and visitors may experience delayed response, prolonged outages, and reduced access to services.
Bryce Canyon City	**Vulnerabilities:** Bryce Canyon City is vulnerable to earthquakes because residents, workers, visitors, lodging, public facilities, roads, utilities, and visitor-serving infrastructure may be exposed to damaging ground shaking. The earthquake profile identifies a recent moderate earthquake north of Bryce Canyon City, and the city's visitor-serving economy increases sensitivity to disruptions affecting lodging, transportation, communications, and emergency access. **Impacts:** Earthquakes could damage buildings, lodging facilities, utilities, roads, and communications systems; injure people from falling objects or damaged structures; and disrupt emergency response and visitor movement. Critical infrastructure impacts could include Bryce Canyon City Town Hall, the Public Safety Building and Fire Department, ambulance and search and rescue assets, mass-casualty trailer, sewer and water systems, roads, shuttle station, wellness center, lodging, RV parks, campgrounds, auto care/fuel services, employee housing, and access to Bryce Canyon National Park. Impacts to transportation routes, lodging, and public facilities could interrupt tourism operations and complicate support for visitors unfamiliar with local hazards.
Town of Cannonville	**Vulnerabilities:** The Town of Cannonville is vulnerable to earthquakes because residences, town facilities, local roads, utilities, communications service, agricultural and ranching structures, and community functions may be exposed to countywide ground shaking. The town's rural setting, limited local administrative capacity, county-provided law enforcement, and reliance on regional electric and communications providers may increase vulnerability if roads, utilities, or communications are disrupted. **Impacts:** Earthquakes could damage older homes, outbuildings, public facilities, roads, bridges, culverts, utilities, and communications systems. Critical infrastructure impacts could include Cannonville town facilities, the public water system, local roads and drainage crossings, utility and communications infrastructure, agricultural/ranching infrastructure, and visitor routes connecting the town with Bryce Canyon and surrounding recreation areas. Impacts may include injuries, power or communication outages, interruption of town operations, damage to agricultural or ranching assets, and delayed emergency response or utility restoration if access routes are damaged.
City of Escalante	**Vulnerabilities:** The City of Escalante is vulnerable to earthquakes because residents, businesses, public facilities, schools, utilities, roads, and visitor-serving assets may be exposed to countywide ground shaking. The earthquake profile identifies a past moderate earthquake southeast of

Plan Participant	Vulnerabilities and Impacts
	Escalante, and Garfield County has identified unreinforced masonry at Escalante School with retrofit pending, increasing vulnerability for school facilities. The city's reliance on county law enforcement, regional utility service, and recreation travel routes may increase sensitivity to lifeline and access disruptions. **Impacts:** Earthquakes could damage buildings, school facilities, older or unreinforced masonry structures, roads, bridges, utilities, communications systems, and businesses. Critical infrastructure impacts could include Escalante City Offices, Escalante Fire Department, Escalante Municipal Airport, city water and sewer systems, Escalante Public Library/Art Center, Senior Citizens Center, post office, Garkane Energy, South Central Communications, Escalante Petrified Forest State Park, Escalante Interagency Visitor Center, lodging, fuel access, and public lands access routes. Potential impacts include injuries, school or public facility closures, power and communication outages, disruption to local government and visitor services, business interruption, and delayed emergency response if roads or lifelines are damaged.
Town of Hatch	**Vulnerabilities:** The Town of Hatch is vulnerable to earthquakes because residents, homes, local roads, utilities, communications, propane service access, agricultural and ranching structures, and recreation travel routes may be exposed to countywide ground shaking. The town's rural setting, volunteer elected leadership, county-provided law enforcement, and reliance on regional electric and fuel providers may increase vulnerability if transportation, utility, or fuel access is disrupted. **Impacts:** Earthquakes could damage homes, outbuildings, roads, bridges, utility lines, fuel access points, and communications systems. Critical infrastructure impacts could include Hatch Town Hall/community center, Hatch Town Water System, Hatch Volunteer Fire Department, Hatch Irrigation Company facilities, U.S. 89 travel corridor, local roads and drainage crossings, propane/fuel access, parks, cemetery, and public facilities. Impacts may include injuries, service outages, interruption of propane or fuel access, damage to agricultural or ranching assets, unsafe travel conditions, and delayed emergency response or restoration if roads are damaged or blocked.
Town of Henrieville	**Vulnerabilities:** The Town of Henrieville is vulnerable to earthquakes because residents, homes, community facilities, local roads, utilities, communications, agricultural and ranching assets, and daily community functions may be exposed to countywide ground shaking. The town's small size, limited local administrative capacity, county law enforcement support, and reliance on regional utility service may increase vulnerability if roads, power, communications, or emergency access are disrupted. **Impacts:** Earthquakes could damage homes, outbuildings, roads, bridges, utility connections, communications systems, and community facilities. Critical infrastructure impacts could include Henrieville Town Office/Town Hall at 70 Main Street, Henrieville Volunteer Fire Department, Henrieville Town Culinary Water system, Henrieville Irrigation Company facilities, local roads and

Plan Participant	Vulnerabilities and Impacts
	drainage crossings, community facilities, agricultural/ranching infrastructure, and utility and communications service. Potential impacts include injuries, power and communication outages, interruption of local services, damage to agricultural or ranching assets, and delayed response or repair if outside support must reach the town over damaged routes.
Panguitch City	**Vulnerabilities:** The Panguitch City is vulnerable to earthquakes because it contains the county seat, a concentration of residents and housing, municipal services, schools, public facilities, streets, water systems, emergency service assets, businesses, and transportation routes. The earthquake profile identifies a recent moderate earthquake northwest of Panguitch, and Garfield County has identified unreinforced masonry at Panguitch School with partial replacement or verification pending. Older buildings, school facilities, utility systems, and public service functions are therefore important local vulnerabilities. **Impacts:** Earthquakes could damage homes, older or unreinforced masonry buildings, schools, public facilities, streets, roads, bridges, utilities, water and wastewater systems, and communications. Critical infrastructure impacts could include Panguitch City Hall, City Services and Public Works, Utility Department, Panguitch Fire Department, Garfield County Sheriff's Office/Jail, Garfield County Ambulance, Garfield County Courthouse and Justice Court facilities, Garfield Memorial Hospital and local health services, schools, Panguitch Municipal Airport, U.S. 89, State Route 143, city streets, public buildings, communications, power service, and visitor-serving businesses. Because Panguitch concentrates county and municipal services, impacts could include injuries, school or government closures, utility outages, emergency response disruption, business interruption, and delayed countywide coordination if facilities or lifelines are damaged.
Town of Tropic	**Vulnerabilities:** The Town of Tropic is vulnerable to earthquakes because residences, town facilities, local roads, utilities, communications, waste service access, fuel and propane service, businesses, and visitor-serving assets may be exposed to countywide ground shaking. The town's connection to nearby recreation and park destinations increases exposure for residents, businesses, and visitors, while reliance on county law enforcement and regional service providers may increase vulnerability if access or lifeline systems are disrupted. **Impacts:** Earthquakes could damage homes, businesses, public facilities, roads, bridges, utility lines, communications systems, and service infrastructure. Critical infrastructure impacts could include Tropic Town Office, Heritage Center/Town Council Room, senior/community/wellness center, Tropic Town Water System, sewer system, roads and streets, maintenance shed/yard, town park/scout house, Tropic Volunteer Fire Department, irrigation company facilities, local businesses, visitor-serving facilities, fuel/propane access, and routes serving Bryce Canyon-area recreation. Impacts may include injuries, power or communication outages, interruption of waste, fuel, or propane service access, disruption to visitor travel and local

Plan Participant	Vulnerabilities and Impacts
	businesses, and delayed emergency response if roads or lifelines are damaged.

Extreme Heat

Table 81 summarizes vulnerabilities and potential impacts associated with extreme heat for Garfield County participants.

Table 81: Extreme Heat Vulnerability and Impact Assessment for Garfield County

Plan Participant	Vulnerabilities and Impacts
Garfield County	**Vulnerabilities:** Garfield County is vulnerable to extreme heat across all communities, although average temperatures are generally lower than other counties in the Five County region because many communities are at higher elevations. Vulnerable populations and assets include older adults, outdoor workers, residents without reliable cooling, visitors recreating outdoors during summer, public facilities, power and water systems, agricultural and livestock operations, natural resources, and recreation-based economic activity. Garfield County's leisure and hospitality sector and high summer visitation increase exposure for visitors who may be unfamiliar with local heat risks. **Impacts:** Extreme heat can cause dehydration, heat exhaustion, heat stroke, increased emergency medical demand, increased energy and water use, stress on power and water systems, reduced outdoor work productivity, and disruptions to outdoor recreation and tourism. Critical infrastructure impacts could include Garfield Memorial Hospital and EMS response, schools and public facilities used for cooling or public messaging, water systems, electric distribution systems, communications, public safety facilities, roads affected by heat-related vehicle incidents, campgrounds, trailheads, lodging, and visitor centers. Heat may also stress livestock and vegetation, reduce agricultural productivity, worsen drought conditions, increase wildfire potential, and contribute to closures or cancellations of outdoor events and activities.
Town of Antimony	**Vulnerabilities:** The Town of Antimony is vulnerable to extreme heat because residents, older adults, outdoor workers, agricultural and ranching operations, livestock, local roads, utility-dependent services, and residents without reliable cooling may be affected during extended hot periods. The town's rural setting, volunteer elected leadership, county-provided law enforcement, and reliance on regional utility and communication providers may increase sensitivity if heat increases medical, water, power, or public messaging needs. **Impacts:** Extreme heat could cause heat-related illness, increased demand for hydration and cooling, stress on livestock and forage, higher power and water use, reduced outdoor work productivity, and increased wildfire or drought-

Plan Participant	Vulnerabilities and Impacts
	related stress. Prolonged heat may also place added coordination demands on town leadership, county emergency services, and regional utility providers.
Town of Boulder	**Vulnerabilities:** The Town of Boulder is vulnerable to extreme heat because residents, older adults, outdoor workers, small businesses, visitors, recreation users, public facilities, utilities, and natural resource areas may be affected during hot periods. Although Boulder's higher elevation contributes to lower average temperatures than lower-elevation communities, summer heat can still create health risks for residents and visitors recreating in remote terrain where shade, water, and emergency access may be limited. **Impacts:** Extreme heat could cause heat-related illness among residents, workers, and visitors; increase demand for water, cooling, and emergency response; reduce outdoor recreation activity; and affect small businesses tied to visitor travel. Heat can also stress vegetation and wildlife, worsen drought conditions, increase wildfire potential, and complicate response where travel distances and access limitations are significant.
Bryce Canyon City	**Vulnerabilities:** Bryce Canyon City is vulnerable to extreme heat because residents, workers, lodging facilities, public facilities, utilities, visitors, and outdoor recreation users may be exposed during summer heat events. Average July temperatures near Bryce Canyon are lower than some lower-elevation areas, but the city's visitor-serving role increases exposure for seasonal visitors who may be outdoors for extended periods and may not be acclimated to heat or elevation. **Impacts:** Extreme heat could cause heat-related illness among visitors, workers, and residents; increase demand for emergency medical response, cooling, hydration, electricity, and water; and affect lodging, park-support services, and visitor travel. Critical infrastructure impacts could include Bryce Canyon City water and sewer systems, Public Safety Building, ambulance and first responder assets, winter mobile clinic space, shuttle station, wellness center, lodging, RV parks, campgrounds, auto care/fuel services, and access to Bryce Canyon National Park. Prolonged heat may also reduce outdoor activity, stress vegetation, worsen drought and wildfire conditions, and affect tourism operations during peak visitation periods.
Town of Cannonville	**Vulnerabilities:** The Town of Cannonville is vulnerable to extreme heat because residents, older adults, outdoor workers, agricultural and ranching operations, visitors, town facilities, local roads, utility-dependent services, and residents without reliable cooling may be affected during extended hot periods. The town's rural setting, limited local administrative capacity, county-provided law enforcement, and reliance on regional utility and communication providers may increase vulnerability if heat increases medical, water, power, or public messaging needs. **Impacts:** Extreme heat could cause heat-related illness, increase demand for hydration and cooling, stress livestock and vegetation, increase water and power use, reduce outdoor work productivity, and worsen drought and wildfire conditions. Critical infrastructure impacts could include Cannonville's

Plan Participant	Vulnerabilities and Impacts
	public water system, town facilities, local roads, power and communications service, agricultural/ranching infrastructure, and visitor-serving travel routes. Prolonged heat may also affect recreation travel, visitor safety, and the town's ability to coordinate public information, emergency response, and service support with county and regional partners.
City of Escalante	**Vulnerabilities:** The City of Escalante is vulnerable to extreme heat because it supports residents, older adults, outdoor workers, public facilities, businesses, visitors, and recreation users who may be exposed during hot periods. Vulnerable assets include residents without reliable cooling, lodging and visitor-serving businesses, utilities, water systems, outdoor work sites, agricultural and ranching operations, and recreation routes connected to Grand Staircase-Escalante and surrounding public lands. **Impacts:** Extreme heat could cause heat-related illness among residents, workers, and visitors; increase emergency medical demand; increase electricity and water use; reduce outdoor work productivity; and affect recreation and tourism activity. Critical infrastructure impacts could include Escalante City Offices, Escalante Fire Department, Escalante Municipal Airport, city water and sewer systems, public library/art center, Senior Citizens Center, lodging, fuel access, utilities, and recreation/public lands access points. Prolonged heat may also stress livestock and vegetation, worsen drought conditions, increase wildfire potential, affect outdoor events, and increase operating costs for businesses and public facilities.
Town of Hatch	**Vulnerabilities:** The Town of Hatch is vulnerable to extreme heat because residents, older adults, outdoor workers, agricultural and ranching operations, livestock, local roads, utilities, propane service access, visitors, and residents without reliable cooling may be affected during extended hot periods. The town's rural setting, volunteer elected leadership, county-provided law enforcement, and reliance on regional electric and fuel providers may increase sensitivity if heat increases cooling, medical, power, water, or public information needs. **Impacts:** Extreme heat could cause heat-related illness, increase water and electricity demand, reduce outdoor work productivity, stress livestock and forage, and contribute to drought and wildfire conditions. Critical infrastructure impacts could include Hatch Town Water System, Hatch Irrigation Company, Hatch Town Hall/community center, Hatch Volunteer Fire Department, U.S. 89 travel corridor, propane/fuel access, parks, and utility systems. Heat-related disruptions may affect residents, ranching operations, visitor travel, fuel or propane service access, emergency response demand, and coordination with county and regional partners.
Town of Henrieville	**Vulnerabilities:** The Town of Henrieville is vulnerable to extreme heat because residents, older adults, outdoor workers, agricultural and ranching assets, livestock, community facilities, local roads, utilities, and residents without reliable cooling may be affected during extended hot periods. The town's small size, limited local administrative capacity, county law

Plan Participant	Vulnerabilities and Impacts
	enforcement support, and reliance on regional utility service may increase vulnerability if heat creates medical, cooling, power, water, or communication needs. **Impacts:** Extreme heat could cause heat-related illness, increase demand for hydration and cooling, stress livestock and vegetation, reduce outdoor work productivity, increase water and power use, and worsen drought or wildfire conditions. Critical infrastructure impacts could include Henrieville Town Office/Town Hall, Henrieville Volunteer Fire Department, Henrieville Town Culinary Water system, Henrieville Irrigation Company facilities, local roads, community facilities, utility and communications service, and agricultural/ranching infrastructure. Prolonged heat may place additional demand on town leadership, county emergency services, and regional utility providers for public messaging, welfare checks, and response coordination.
Panguitch City	**Vulnerabilities:** The Panguitch City is vulnerable to extreme heat because it contains the county seat, a concentration of residents and housing, municipal services, schools, public facilities, emergency service assets, businesses, streets, water systems, and visitor-serving uses. Although Panguitch's higher elevation results in lower average temperatures than lower-elevation parts of the region, extreme heat can still affect older adults, residents without reliable cooling, outdoor workers, visitors, public facilities, and agricultural and ranching activity connected to the city. **Impacts:** Extreme heat could cause heat-related illness, increase emergency medical demand, increase electricity and water use, stress municipal services and public facilities, reduce outdoor work productivity, and affect schools, events, and recreation activity. Critical infrastructure impacts could include Panguitch City Hall, City Services and Public Works, Utility Department, Panguitch Fire Department, Garfield Memorial Hospital and local health services, schools, Panguitch Municipal Airport, city streets, U.S. 89, State Route 143, communications, power service, water and wastewater systems, public buildings, and visitor-serving businesses. Because Panguitch concentrates county and municipal services, prolonged heat could also increase demands on local government operations, public messaging, business continuity, emergency response, and support for residents and visitors.
Town of Tropic	**Vulnerabilities:** The Town of Tropic is vulnerable to extreme heat because residents, older adults, outdoor workers, town facilities, local businesses, utilities, waste service access, fuel and propane service, visitor-serving assets, and recreation users may be affected during hot periods. The town's connection to nearby park and recreation destinations increases exposure for visitors who may be outdoors during summer heat and may not be acclimated or prepared with adequate water and cooling. **Impacts:** Extreme heat could cause heat-related illness among residents, workers, and visitors; increase demand for hydration, cooling, emergency response, electricity, and water; reduce outdoor recreation activity; and affect local businesses and visitor travel. Critical infrastructure impacts could include

Plan Participant	Vulnerabilities and Impacts
	Tropic Town Office, Heritage Center/Town Council Room, senior/community/wellness center, Tropic Town Water System, sewer system, roads and streets, fire department functions, town park/scout house, maintenance shed/yard, irrigation company facilities, local businesses, visitor-serving facilities, and routes serving Bryce Canyon-area recreation. Heat may also stress vegetation and livestock, worsen drought conditions, increase wildfire potential, and disrupt outdoor events, waste service access, fuel or propane availability, and town operations during prolonged hot periods.

Flooding

Table 82 summarizes vulnerabilities and potential impacts associated with flooding for Garfield County participants.

Table 82: Flooding Vulnerability and Impact Assessment for Garfield County

Plan Participant	Vulnerabilities and Impacts
Garfield County	**Vulnerabilities:** Garfield County is vulnerable to flooding because flood risk is classified as significant and is concentrated along river corridors, canyon mouths, alluvial fans, ephemeral washes, slot canyons, low-water crossings, and areas downstream of wildfire burn scars. Vulnerable assets include residents and visitors in flood-prone or recreation areas, dispersed homes and businesses, public facilities, roads, bridges, culverts, utilities, water and wastewater systems, agricultural lands, riparian corridors, park lands, and tourism and recreation assets. Flood impacts may occur both within mapped Special Flood Hazard Areas and outside mapped floodplains where localized monsoon storms, snowmelt, rain-on-snow, or post-wildfire runoff produce flash flooding or debris-laden flows. **Impacts:** Flooding can cause injury or loss of life, evacuations, damage to homes and public facilities, erosion and undermining of structures, road and bridge washouts, culvert failure, utility and communication outages, water and wastewater disruptions, agricultural losses, and closures of parks, trails, roads, and community facilities. Critical infrastructure impacts could include county roads, bridges, culverts, drainage infrastructure, landfill and solid waste operations, Garfield County Sheriff's Office/Jail, schools, Garfield Memorial Hospital, fire/EMS facilities, water and wastewater systems, electric and communications networks, and visitor-serving facilities along U.S. 89, State Route 12, State Route 24, State Route 22, and State Route 143. Garfield County has experienced recent flash flood and flood events in locations including Cannonville, Tropic, Boulder, Escalante, Bryce Canyon, and Panguitch, demonstrating that localized events can disrupt transportation, visitor access, emergency response, and local economies.

Plan Participant	Vulnerabilities and Impacts
Town of Antimony	**Vulnerabilities:** The Town of Antimony is vulnerable to flooding where residents, homes, local roads, utilities, agricultural lands, ranching assets, and drainage crossings are located near low-lying areas, creeks, washes, or flood-prone corridors. The town's rural setting, limited local administrative capacity, volunteer elected leadership, county-provided law enforcement, and reliance on regional utility and communication providers may increase vulnerability if roads, bridges, culverts, or utilities are damaged or if rapid warning and response are needed. **Impacts:** Flooding could damage roads, culverts, bridges, homes, outbuildings, fences, agricultural lands, and utility infrastructure; strand residents; disrupt ranching and agricultural operations; and delay county emergency response or utility restoration. Flash flooding or debris-laden runoff may also create erosion, sediment deposition, and access issues that affect daily travel and service continuity.
Town of Boulder	**Vulnerabilities:** The Town of Boulder is vulnerable to flooding because steep terrain, canyon corridors, washes, and drainage crossings can produce rapid runoff, flash flooding, debris-laden flows, erosion, and road blockage during intense storms. Vulnerable assets include residents, visitors, homes, small businesses, public facilities, roads, bridges, utilities, recreation access routes, and natural resources. The flood profile documents a recent flash flood event in Boulder, and the town's remote setting and limited redundant access may increase vulnerability when roads or utilities are disrupted. **Impacts:** Flooding could damage roads, bridges, culverts, utilities, homes, businesses, public facilities, and recreation access routes; isolate residents or visitors; disrupt emergency response; and affect local businesses tied to recreation and visitor travel. Debris, sediment, erosion, or slope instability could prolong closures and increase repair needs after a flash flood.
Bryce Canyon City	**Vulnerabilities:** Bryce Canyon City is vulnerable to flooding because visitors, workers, residents, lodging, roads, public facilities, utilities, and visitor-serving infrastructure may be affected by flash flooding, stormwater runoff, drainage exceedance, and access disruptions. The flood profile documents recent flash flood events near Ruby's Inn and Bryce Canyon, indicating exposure in visitor-oriented areas. Seasonal visitation increases the number of people who may be exposed to fast-developing storms, unfamiliar terrain, and drainage crossings. **Impacts:** Flooding could cause road closures, damage to lodging and public facilities, drainage and culvert impacts, utility disruptions, visitor delays, emergency response challenges, and interruptions to park-support and tourism operations. Flash flooding may also strand visitors, reduce access to recreation areas, and create public safety concerns during peak visitation periods.

Plan Participant	Vulnerabilities and Impacts
Town of Cannonville	**Vulnerabilities:** The Town of Cannonville is vulnerable to flooding because homes, town facilities, local roads, utilities, drainage crossings, agricultural and ranching assets, and nearby recreation routes may be exposed to flash flooding, runoff in normally dry washes, debris-laden flows, and erosion. The flood profile documents recent flash flood events in Cannonville in 2022, indicating localized exposure. The town's rural setting, limited administrative capacity, county-provided law enforcement, and reliance on regional utility and communication providers may increase vulnerability if warning, access, response, or restoration is needed.[186] **Impacts:** Flooding could damage roads, culverts, bridges, homes, outbuildings, fences, agricultural lands, utilities, and drainage infrastructure; create sediment and debris hazards; strand residents or visitors; and disrupt movement between Cannonville and nearby communities or recreation areas. Critical infrastructure impacts could include Cannonville town facilities, the public water system, local road and drainage crossings, utility and communication infrastructure, agricultural/ranching infrastructure, and visitor travel routes used as a base camp for Bryce Canyon and surrounding recreation. Flood-related road damage or utility disruption could delay emergency response and increase recovery needs for local residents and ranching operations.
City of Escalante	**Vulnerabilities:** The City of Escalante is vulnerable to flooding because residents, businesses, public facilities, roads, utilities, and visitor-serving assets may be exposed to flash flooding, stormwater runoff, drainage exceedance, erosion, and flooding in washes or low-lying areas. The flood profile documents a recent flash flood event near Escalante Municipal Airport, and the city's recreation and public lands travel setting increases exposure for visitors and transportation routes during intense storms. **Impacts:** Flooding could damage roads, culverts, bridges, drainage facilities, homes, businesses, public buildings, utilities, and communications systems; interrupt local government services, lodging, fuel access, and visitor travel; and create hazardous conditions for residents and recreation users. Critical infrastructure impacts could include Escalante City Offices, Escalante Fire Department, Escalante Municipal Airport, city water and sewer systems, Escalante Public Library/Art Center, Senior Citizens Center, post office, Garkane Energy, South Central Communications, Escalante Petrified Forest State Park, and the Escalante Interagency Visitor Center. Sediment, debris, erosion, and road closures could affect emergency response, business continuity, and access to nearby public lands and scenic routes.
Town of Hatch	**Vulnerabilities:** The Town of Hatch is vulnerable to flooding where homes, local roads, drainage crossings, utilities, communications, propane service access, agricultural facilities, and recreation travel routes are located near

[186] NOAA National Centers for Environmental Information, Storm Events Database, annual details CSV files, retrieved October 10, 2026. https://www.ncei.noaa.gov/pub/data/swdi/stormevents/csvfiles/ Event 1054504, August 21, 2022, reported flash flooding and mud/debris on SR-12 between Cannonville and Henrieville.

Plan Participant	Vulnerabilities and Impacts
	washes, low-lying areas, or channels that can receive rapid runoff. The town's rural setting, volunteer elected leadership, county-provided law enforcement, and reliance on regional electric and fuel providers may increase vulnerability if roads, culverts, utilities, or fuel access points are damaged during flash flooding or debris-laden runoff. **Impacts:** Flooding could damage roads, culverts, bridges, homes, outbuildings, fences, utility lines, and fuel access routes; strand residents or visitors; disrupt electricity, communications, fuel, and propane access; and affect agricultural or ranching operations. Critical infrastructure impacts could include Hatch Town Hall/community center, Hatch Town Water System, Hatch Irrigation Company, Hatch Volunteer Fire Department, U.S. 89 travel corridor, local roads and drainage crossings, propane/fuel access, parks, cemetery, and public facilities. Road closures or washouts could delay emergency response and restoration where outside providers must access the community.
Town of Henrieville	**Vulnerabilities:** The Town of Henrieville is vulnerable to flooding where residents, local roads, drainage crossings, utilities, community facilities, agricultural lands, ranching assets, and low-lying areas may be exposed to flash flooding, runoff in washes, erosion, and sediment or debris movement. The town's small size, limited local administrative capacity, county law enforcement support, and reliance on regional utility service may increase vulnerability if warning, response, access, or restoration is needed. **Impacts:** Flooding could damage homes, outbuildings, roads, culverts, bridges, fences, utilities, and agricultural or ranching assets; create debris and sediment hazards; interrupt power or communications; and limit access for residents, emergency responders, and service providers. Critical infrastructure impacts could include Henrieville Town Office/Town Hall, Henrieville Volunteer Fire Department, Henrieville Town Culinary Water system, Henrieville Irrigation Company facilities, local roads and drainage crossings, community facilities, utility and communications infrastructure, and ranching/agricultural infrastructure. Damage to local roads or drainage crossings could delay response and repairs and disrupt daily travel.
Panguitch City	**Vulnerabilities:** The Panguitch City is vulnerable to flooding because it contains the county seat, a concentration of residents and housing, municipal services, schools, public facilities, emergency service assets, streets, roads, bridges, culverts, water systems, businesses, and transportation routes. Intense rainfall and post-wildfire runoff can produce flooding, sedimentation, and debris flows in developed areas and along downstream routes. NFIP capabilities and local floodplain administration are important because mapped floodplains and localized runoff both contribute to risk.[187] **Impacts:** Flooding could damage homes, public facilities, schools, streets, roads, bridges, culverts, utilities, water and wastewater systems, businesses, and drainage infrastructure; cause erosion and sediment deposition; interrupt local government services and emergency response; and disrupt countywide

[187] NFIP = National Flood Insurance Program

Plan Participant	Vulnerabilities and Impacts
	coordination. Critical infrastructure impacts could include Panguitch City Hall, City Services and Public Works, Utility Department, Panguitch Fire Department, Garfield County Sheriff's Office, Garfield County Ambulance, Garfield County Courthouse and Justice Court facilities, Garfield Memorial Hospital and local health services, schools, Panguitch Municipal Airport, U.S. 89, State Route 143, city streets, communications, power service, and visitor-serving businesses. Because Panguitch concentrates services and population, road closures, utility disruption, or public facility damage could have broader impacts on residents, visitors, businesses, and nearby rural communities.
Town of Tropic	**Vulnerabilities:** The Town of Tropic is vulnerable to flooding because residences, town facilities, local roads, utilities, communications, waste service access, fuel and propane service, businesses, visitor-serving assets, agricultural or ranching areas, and nearby recreation routes may be exposed to flash flooding, stormwater runoff, drainage exceedance, and debris-laden flows. The flood profile documents recent flash flood events in Tropic, indicating localized exposure. The town's connection to nearby recreation and park destinations increases exposure for residents, businesses, and visitors during rapidly developing storms. **Impacts:** Flooding could damage homes, businesses, town facilities, roads, culverts, bridges, utility lines, drainage infrastructure, fences, and service access routes; interrupt power, communications, waste service, fuel, or propane availability; and disrupt visitor travel and local businesses. Critical infrastructure impacts could include Tropic Town Office, Heritage Center/Town Council Room, senior/community/wellness center, Tropic Town Water System, sewer system, roads and streets, maintenance shed/yard, town park/scout house, fire department functions, irrigation company facilities, local businesses, visitor-serving facilities, and routes serving Bryce Canyon-area recreation. Flash flooding may also strand residents or visitors, create public safety concerns, and delay emergency response if roads or drainage crossings are damaged.

Hail

Table 83 summarizes vulnerabilities and potential impacts associated with hail for Garfield County participants.

Table 83: Hail Vulnerability and Impact Assessment for Garfield County

Plan Participant	Vulnerabilities and Impacts
Garfield County	**Vulnerabilities:** Garfield County has moderate hail vulnerability, with localized areas of elevated risk where community assets, tourism infrastructure, transportation corridors, and agricultural production overlap. Vulnerable assets include residents and visitors caught outdoors, approximately 3,803 housing units, public buildings, schools, emergency service facilities, utility assets, lodging and visitor-serving businesses, campgrounds, signage, trailhead facilities, vehicles, solar installations, HVAC[188] units, communications equipment, 297 farms and ranch operations, 85,397 acres of land in farms, 15,721 irrigated acres, and about 13,109 acres of forage production. Recent hail reports near Bryce Canyon, Ruby's Inn, and Boulder demonstrate that hail can affect developed areas, visitor destinations, highways, and agricultural lands.[189] **Impacts:** Hail can damage roofs, siding, windows, skylights, vehicles, solar equipment, HVAC units, signage, outdoor recreation infrastructure, and agricultural assets. Critical infrastructure impacts could include county road and drainage facilities, Garfield County public buildings and courthouse functions, the Garfield County Sheriff's Office/Jail, Garfield County Ambulance District facilities and vehicles, Garfield Memorial Hospital, schools, fire stations, public works equipment, water and wastewater facilities, communications equipment, electric distribution systems, Bryce Canyon Airport facilities, campgrounds, visitor centers, lodging, and vehicles along major travel corridors. Impacts may include injury to people or livestock caught outdoors, crop and forage losses, damage to fencing, barns, sheds, pivots, and equipment, hazardous travel conditions, reduced visitor access, business interruption, increased repair and insurance costs, and temporary disruption to public services, tourism, transportation, and agricultural operations.
Town of Antimony	**Vulnerabilities:** The Town of Antimony is vulnerable to hail because residents, homes, local roads, utility and communication service, vehicles, agricultural and ranching operations, livestock, fencing, barns, sheds, and equipment may be exposed during localized spring and summer thunderstorms. The town's rural setting, volunteer elected leadership, county-provided law enforcement, and reliance on regional utility and

[188] HVAC = heating, ventilation, and air conditioning

[189] USDA National Agricultural Statistics Service, 2022 Census of Agriculture, Garfield County, Utah county profile, pages 1-2. https://www.nass.usda.gov/Publications/AgCensus/2022/Online_Resources/County_Profiles/Utah/cp49017.pdf. Figures describe countywide agriculture, not mapped hazard exposure.

Plan Participant	Vulnerabilities and Impacts
	communication providers may increase vulnerability if hail damages roofs, vehicles, utility equipment, or agricultural assets and repair resources must come from outside the community. **Impacts:** Hail could damage roofs, siding, windows, vehicles, outbuildings, fencing, livestock facilities, stored forage, and agricultural equipment; injure people or livestock caught outdoors; and create hazardous driving conditions. Critical infrastructure impacts could include Antimony's community center/town meeting location, town water system components, the Antimony Volunteer Fire Department/fire station area, post office, local roads, utility and communications service, landfill-related operations, and agricultural/ranching infrastructure. Damage to homes, ranch infrastructure, utilities, or communications could interrupt daily activities, delay response, increase repair costs, and affect ranching operations during the growing season.
Town of Boulder	**Vulnerabilities:** The Town of Boulder is vulnerable to hail because high-elevation thunderstorms can produce localized hail that affects homes, small businesses, public facilities, roads, vehicles, utilities, recreation access routes, visitor-serving assets, and nearby agricultural or ranching operations. The hail profile identifies a 1.75-inch hail event near Boulder on October 1, 2022, confirming exposure to damaging hail. The town's remote setting, long travel distances, and limited local repair capacity may increase vulnerability after damaging storms. **Impacts:** Hail could damage roofs, siding, windows, vehicles, solar equipment, signage, outdoor equipment, fencing, and agricultural assets; create hazardous travel conditions; and disrupt visitor access, small businesses, and emergency response. Critical infrastructure impacts could include Boulder Town facilities, Boulder Volunteer Fire Department, volunteer EMT functions, Town of Boulder Water Department, Rocky Mountain Power service, local roads, landfill and cemetery access, campgrounds, trailheads, Scenic Byway 12, and recreation access routes. Damage along local roads or Scenic Byway 12 could delay travel, service delivery, and repairs for residents and visitors.
Bryce Canyon City	**Vulnerabilities:** Bryce Canyon City is vulnerable to hail because residents, workers, visitors, lodging, public facilities, roads, utilities, vehicles, signage, campgrounds, trailhead facilities, and visitor-serving infrastructure may be exposed during localized thunderstorms. The hail profile identifies a 1.50-inch hail event near Bryce Canyon and a 0.88-inch hail event near Ruby's Inn in 2021, demonstrating that hail can affect developed and visitor-oriented areas. Seasonal visitation increases exposure for people, vehicles, lodging, and outdoor recreation assets.[190] **Impacts:** Hail could damage lodging facilities, roofs, windows, vehicles, signs, outdoor equipment, utilities, and recreation-support infrastructure; injure

[190] NOAA National Centers for Environmental Information, Storm Events Database, annual details CSV files, retrieved October 10, 2026. https://www.ncei.noaa.gov/pub/data/swdi/stormevents/csvfiles/ Events 973779 (July 22, 2021, 1.50-inch hail) and 981962 (August 17, 2021, 0.88-inch hail). These are historical examples and include a report below the 1-inch threshold used for regional severe-hail totals.

Plan Participant	Vulnerabilities and Impacts
	people caught outdoors; and create hazardous driving conditions. Critical infrastructure impacts could include Bryce Canyon City Town Hall, the Public Safety Building and Fire Department, ambulance and search and rescue vehicles, mass-casualty trailer, sewer and water systems, roads, shuttle station, wellness center, lodging, RV parks, campgrounds, auto care/fuel services, employee housing, and access to Bryce Canyon National Park. Impacts to lodging, visitor facilities, vehicles, and road access could disrupt tourism operations, delay visitor travel, increase repair costs, and strain emergency response during peak visitation periods.
Town of Cannonville	**Vulnerabilities:** The Town of Cannonville is vulnerable to hail because localized thunderstorms can affect homes, town facilities, local roads, vehicles, utilities, communications service, signage, agricultural and ranching assets, livestock, fencing, barns, sheds, and equipment. The town's rural setting, limited administrative capacity, county-provided law enforcement, and reliance on regional utility and communication providers may increase vulnerability if hail damages property, vehicles, utility equipment, or agricultural assets and repair resources must come from outside the community. **Impacts:** Hail could damage roofs, siding, windows, vehicles, signs, outbuildings, fencing, livestock facilities, stored forage, and agricultural equipment; injure people or livestock caught outdoors; and create hazardous travel conditions. Critical infrastructure impacts could include Cannonville town facilities, the public water system, local roads and drainage crossings, utility and communications infrastructure, agricultural/ranching infrastructure, and visitor-serving travel routes connected to Bryce Canyon and surrounding recreation. Damage to town facilities, homes, ranch infrastructure, utilities, or communications could interrupt daily activities, delay response, increase repair costs, and affect local agricultural and ranching operations.
City of Escalante	**Vulnerabilities:** The City of Escalante is vulnerable to hail because residents, businesses, public facilities, roads, utilities, vehicles, visitor-serving assets, signage, outdoor equipment, and nearby agricultural or ranching operations may be exposed during localized spring, summer, and early fall thunderstorms. The city's recreation and public lands travel setting increases exposure for visitors, vehicles, lodging, fuel access, and outdoor infrastructure along travel routes connected to Scenic Byway 12 and Grand Staircase-Escalante. **Impacts:** Hail could damage roofs, siding, windows, vehicles, solar equipment, HVAC units, signs, outdoor recreation infrastructure, fencing, and agricultural equipment; create hazardous driving conditions; and injure people or livestock caught outdoors. Critical infrastructure impacts could include Escalante City Offices, Escalante Fire Department, Escalante Municipal Airport, city water and sewer systems, Escalante Public Library/Art Center, Senior Citizens Center, post office, Garkane Energy, South Central Communications, Escalante Petrified Forest State Park, Escalante Interagency Visitor Center, lodging, fuel access, and public lands access routes. Impacts to businesses,

Plan Participant	Vulnerabilities and Impacts
	lodging, fuel access, public facilities, vehicles, and travel routes could disrupt visitor movement, increase repair costs, and affect local commerce and public services.
Town of Hatch	**Vulnerabilities:** The Town of Hatch is vulnerable to hail because homes, local roads, vehicles, utilities, communications, propane service access, agricultural and ranching operations, livestock, fencing, barns, sheds, and equipment may be exposed during localized thunderstorms. The town's rural setting, volunteer elected leadership, county-provided law enforcement, and reliance on regional electric and fuel providers may increase vulnerability if hail damages homes, vehicles, fuel access points, utility equipment, or agricultural assets. **Impacts:** Hail could damage roofs, siding, windows, vehicles, outbuildings, fencing, livestock facilities, stored forage, fuel-related equipment, and agricultural machinery; injure people or livestock outdoors; and create hazardous travel conditions. Critical infrastructure impacts could include Hatch Town Hall/community center, Hatch Town Water System, Hatch Volunteer Fire Department, Hatch Irrigation Company facilities, U.S. 89 travel corridor, propane/fuel access, town roads, parks, cemetery, and public facilities. Damage to utilities, communications, vehicles, or fuel and propane access could disrupt daily activities, delay emergency response, and increase repair and replacement costs.
Town of Henrieville	**Vulnerabilities:** The Town of Henrieville is vulnerable to hail because residents, homes, community facilities, local roads, vehicles, utilities, communications, agricultural and ranching assets, livestock, fencing, outbuildings, sheds, and equipment may be exposed during localized thunderstorms. The town's small size, limited local administrative capacity, county law enforcement support, and reliance on regional utility service may increase vulnerability if hail damages buildings, vehicles, utilities, or ranching assets and repair or response support must come from outside the community. **Impacts:** Hail could damage roofs, siding, windows, vehicles, outbuildings, fencing, livestock facilities, stored forage, and agricultural equipment; injure people or livestock caught outdoors; and create short-term hazardous travel conditions. Critical infrastructure impacts could include Henrieville Town Office/Town Hall, Henrieville Volunteer Fire Department, Henrieville Town Culinary Water system, Henrieville Irrigation Company facilities, local roads, community facilities, utility and communications infrastructure, and agricultural/ranching assets. Damage to homes, community facilities, utilities, or agricultural assets could interrupt daily activities, delay response or repairs, and increase costs for residents and ranching operations.
Panguitch City	**Vulnerabilities:** The Panguitch City is vulnerable to hail because it contains the county seat, a concentration of residents and housing, municipal services, schools, public facilities, emergency service assets, businesses, streets, utility systems, vehicles, fleet vehicles, and visitor-serving facilities. Hail can affect

Plan Participant	Vulnerabilities and Impacts
	roofs, windows, vehicles, exterior equipment, signage, and public facilities, while nearby agricultural and ranching operations may be exposed to crop, forage, fencing, and equipment damage. **Impacts:** Hail could damage homes, schools, public buildings, roofs, siding, windows, vehicles, fleet vehicles, solar equipment, HVAC units, signs, utility equipment, fencing, and agricultural assets; injure people or livestock outdoors; and create hazardous driving conditions. Critical infrastructure impacts could include Panguitch City Hall, City Services and Public Works, Utility Department, Panguitch Fire Department, Garfield County Sheriff's Office/Jail, Garfield County Ambulance, Garfield County Courthouse and Justice Court facilities, Garfield Memorial Hospital and local health services, schools, Panguitch Municipal Airport, U.S. 89, State Route 143, city streets, communications, power service, water and wastewater systems, and visitor-serving businesses. Because Panguitch concentrates county and municipal services, hail-related damage could increase public repair costs, interrupt government and emergency operations, delay travel, affect local businesses, and increase insurance or out-of-pocket costs for residents and property owners.
Town of Tropic	**Vulnerabilities:** The Town of Tropic is vulnerable to hail because residences, town facilities, local roads, vehicles, utilities, communications, waste service access, fuel and propane service, businesses, visitor-serving assets, signage, outdoor recreation infrastructure, and nearby agricultural or ranching assets may be exposed during localized thunderstorms. The town's connection to nearby recreation and park destinations increases exposure for visitors, vehicles, lodging support, and outdoor facilities during peak travel periods. **Impacts:** Hail could damage roofs, siding, windows, vehicles, signs, solar equipment, HVAC units, outdoor equipment, utility assets, fencing, outbuildings, and agricultural equipment; injure people or livestock outdoors; and create hazardous travel conditions. Critical infrastructure impacts could include Tropic Town Office, Heritage Center/Town Council Room, senior/community/wellness center, Tropic Town Water System, sewer system, roads and streets, maintenance shed/yard, town park/scout house, Tropic Volunteer Fire Department, irrigation company facilities, local businesses, visitor-serving facilities, waste service access, fuel/propane access, and routes serving Bryce Canyon-area recreation. Damage to visitor-serving businesses, vehicles, roads, utilities, waste service, fuel or propane access, and recreation infrastructure could disrupt local businesses, visitor travel, emergency response, and service continuity.

Landslide

Table 84 summarizes vulnerabilities and potential impacts associated with landslide for Garfield County participants.

Table 84: Landslide Vulnerability and Impact Assessment for Garfield County

Plan Participant	Vulnerabilities and Impacts
Garfield County	**Vulnerabilities:** Garfield County is vulnerable to landslides because rugged topography, steep canyon walls, plateau margins, cliff-forming sedimentary rock, alluvial drainages, and narrow transportation corridors create conditions for rockfall, debris flows, and slope failures. Vulnerable assets include residents, visitors, homes, public facilities, emergency response routes, State Route 12, State Route 24, U.S. 89 approaches, county roads, bridges, culverts, utility lines, Bryce Canyon and Escalante-area access routes, trailheads, campgrounds, lodges, scenic byway pullouts, public land access points, and tourism-dependent businesses. The county's small permanent population and large geography increase vulnerability where communities and visitor destinations rely on limited routes through steep or geologically unstable terrain. **Impacts:** Landslides could damage or close roads, bridges, culverts, drainage crossings, trailhead access roads, utilities, homes, campgrounds, lodges, and recreation facilities; isolate residents or visitors; delay fire, law enforcement, EMS, search and rescue, public works, and utility restoration; and disrupt access to parks, public lands, schools, healthcare, freight, and daily travel. Critical infrastructure impacts could include Garfield County roads, highways, bridges, drainage systems, Public Works facilities, the Sheriff's Office/Jail, Garfield County Ambulance District, Garfield Memorial Hospital, schools, county landfill and solid waste operations, water and wastewater systems, communications sites, electric distribution corridors, Bryce Canyon Airport, Panguitch Municipal Airport, visitor centers, campgrounds, and lodging along U.S. 89, SR-12, SR-24, SR-22, SR-63, and SR-143. Cascading impacts may include sediment and debris in washes or streams, localized flooding or erosion, power or communication outages, long detours, debris removal and slope stabilization costs, business interruption, reduced visitor access, and tourism-related economic losses.
Town of Antimony	**Vulnerabilities:** The Town of Antimony is vulnerable to landslides where residents, homes, local roads, drainage crossings, utilities, communications, ranch access roads, agricultural support facilities, and emergency response routes intersect steep slopes, unstable embankments, drainages, or post-wildfire runoff areas. Although the town is small and rural, limited local staffing, volunteer elected leadership, county-provided law enforcement, and reliance on regional utility providers may increase vulnerability if slope failures block access routes or damage lifelines. **Impacts:** Landslides, debris flows, or rockfall could damage or block local roads, culverts, bridges, utility lines, ranch access roads, outbuildings, and

Plan Participant	Vulnerabilities and Impacts
	drainage facilities; isolate residents or ranching operations; and delay county emergency response, public works support, and utility restoration. Critical infrastructure impacts could include Antimony's community center/town meeting location, town water system components, Antimony Volunteer Fire Department/fire station area, local road network, post office, landfill-related operations, regional electric and communications service, and agricultural/ranching infrastructure. Secondary impacts may include sediment and debris in channels, localized flooding or erosion, longer detours, increased repair costs, and disruption to daily travel and agricultural operations.
Town of Boulder	**Vulnerabilities:** The Town of Boulder is vulnerable to landslides because steep canyon walls, plateau margins, escarpments, drainage crossings, and narrow access routes create exposure to rockfall, debris flows, and slope failures. Vulnerable assets include residents, visitors, homes, small businesses, public facilities, local roads, utilities, recreation access routes, trailheads, campgrounds, and travel corridors connected to Scenic Byway 12 and surrounding public lands. The town's remote setting, limited redundant access, volunteer emergency services, and county law enforcement support increase vulnerability if slope movement affects transportation or utilities. **Impacts:** Landslides could block or damage roads, culverts, drainage crossings, utility lines, recreation access roads, homes, and small businesses; isolate residents or visitors; and delay fire, EMS, law enforcement, public works, and utility restoration. Critical infrastructure impacts could include Boulder Town facilities, Boulder Volunteer Fire Department, volunteer EMT functions, Town of Boulder Water Department, Rocky Mountain Power service, landfill and cemetery access, local roads, campgrounds, trailheads, Scenic Byway 12, and recreation access routes. Impacts may include long detours, reduced access to public lands and recreation areas, business interruption, sediment and debris in washes, localized flooding or erosion, and increased cleanup, stabilization, and repair costs.
Bryce Canyon City	**Vulnerabilities:** Bryce Canyon City is vulnerable to landslides and rockfall because visitor-serving development, lodging, public facilities, roads, utilities, trailheads, and recreation access routes are located near steep terrain and geologically active Bryce Canyon-area landscapes. Vulnerability is heightened by seasonal visitation, reliance on a limited number of access routes, and the importance of transportation, utility, and lodging systems to residents, workers, and visitors. **Impacts:** Landslides or rockfall could damage or close roads, trail access routes, drainage crossings, utilities, lodging areas, campgrounds, public facilities, and visitor-serving infrastructure. Critical infrastructure impacts could include Bryce Canyon City Town Hall, Public Safety Building and Fire Department, ambulance and search and rescue assets, sewer and water systems, roads, shuttle station, wellness center, lodging, RV parks, campgrounds, auto care/fuel services, employee housing, and access to Bryce Canyon National Park. Impacts may include visitor isolation or delays,

Plan Participant	Vulnerabilities and Impacts
	emergency response challenges, disruptions to lodging and park-support operations, reduced access to Bryce Canyon-area destinations, debris removal and slope stabilization costs, utility outages, and tourism-related economic losses during peak visitation periods.
Town of Cannonville	**Vulnerabilities:** The Town of Cannonville is vulnerable to landslides where homes, town facilities, local roads, drainage crossings, utilities, agricultural and ranching assets, and nearby recreation routes intersect steep slopes, erodible soils, washes, or post-wildfire runoff areas. The town's rural setting, limited administrative capacity, county-provided law enforcement, and reliance on regional utility and communication providers may increase vulnerability if slope failures block access or damage lifelines. **Impacts:** Landslides or debris flows could block or damage local roads, culverts, bridges, utilities, drainage facilities, outbuildings, fences, ranch access roads, and recreation routes. Resulting impacts may include resident or visitor isolation, delayed emergency response and service restoration, disruption to ranching and agricultural operations, sediment and debris deposition, localized flooding or erosion, and increased cleanup and repair costs.
City of Escalante	**Vulnerabilities:** The City of Escalante is vulnerable to landslides because residents, businesses, public facilities, roads, utilities, visitor-serving assets, and recreation access routes may be exposed where development and travel corridors intersect steep terrain, canyon walls, escarpments, drainage crossings, or unstable slopes. The city's role as a gateway to Grand Staircase-Escalante and Scenic Byway 12 increases vulnerability where visitor travel, lodging, fuel access, emergency response, and public land access depend on limited transportation corridors. **Impacts:** Landslides, debris flows, or rockfall could damage or close roads, bridges, culverts, utility lines, trailhead access routes, public facilities, homes, and businesses. Impacts may include delayed emergency response, utility interruption, long detours, reduced access to public lands and recreation areas, disruption to lodging, fuel access, freight, and local businesses, sediment and debris in drainage channels, localized flooding or erosion, and increased costs for debris removal, slope stabilization, and infrastructure repair.
Town of Hatch	**Vulnerabilities:** The Town of Hatch is vulnerable to landslides where local roads, drainage crossings, utilities, communications, propane service access, agricultural facilities, ranch roads, and recreation travel routes intersect steep slopes, erodible embankments, washes, or post-wildfire runoff areas. The town's rural setting, volunteer elected leadership, county-provided law enforcement, and reliance on regional electric and fuel providers may increase vulnerability if slope failures affect transportation, utilities, or fuel access. **Impacts:** Landslides or debris flows could damage or block roads, culverts, bridges, utility lines, fuel and propane access routes, ranch roads, outbuildings, and drainage facilities. Impacts may include resident or visitor isolation, delayed emergency response and utility restoration, service

Plan Participant	Vulnerabilities and Impacts
	interruptions, disruption to agricultural and ranching operations, sediment and debris accumulation, localized flooding or erosion, and increased repair and detour costs.
Town of Henrieville	**Vulnerabilities:** The Town of Henrieville is vulnerable to landslides where residents, homes, community facilities, local roads, drainage crossings, utilities, agricultural lands, ranching assets, and access routes intersect steep slopes, erodible soils, washes, or post-wildfire runoff areas. The town's small size, limited local administrative capacity, county law enforcement support, and reliance on regional utility service may increase vulnerability if slope movement blocks access or damages lifelines. **Impacts:** Landslides or debris flows could damage roads, culverts, bridges, homes, outbuildings, fences, utility lines, drainage infrastructure, and ranch access routes; interrupt power or communications; and delay response or repairs from outside service providers. Secondary impacts may include sediment and debris in washes, localized flooding or erosion, longer detours, temporary isolation, and increased costs for residents, ranching operations, and public works support.
Panguitch City	**Vulnerabilities:** The Panguitch City is vulnerable to landslides because it contains the county seat, a concentration of residents and housing, municipal services, schools, public facilities, emergency service assets, streets, utilities, water systems, businesses, and transportation routes that may be affected by slope failures along access corridors, drainage crossings, embankments, and nearby steep terrain. Panguitch also depends on regional routes that can be affected by landslide, rockfall, post-wildfire debris flow, and slope instability in surrounding canyon and mountain areas. **Impacts:** Landslides could damage or close roads, bridges, culverts, drainage facilities, utilities, public facilities, homes, businesses, and access routes serving Panguitch and nearby rural communities. Because Panguitch concentrates county and municipal services, impacts could include delayed emergency response, public works and utility restoration challenges, school or government disruption, reduced access to healthcare and supplies, business interruption, sediment and debris in drainage systems, localized flooding or erosion, long detours, and broader countywide coordination impacts.
Town of Tropic	**Vulnerabilities:** The Town of Tropic is vulnerable to landslides where residences, town facilities, local roads, drainage crossings, utilities, communications, waste service access, fuel and propane service, visitor-serving businesses, recreation routes, and nearby agricultural or ranching assets intersect steep terrain, erodible slopes, washes, or post-wildfire runoff areas. The town's connection to nearby park and recreation destinations increases exposure for residents, businesses, visitors, and service providers when access routes are limited. **Impacts:** Landslides, debris flows, or rockfall could damage or block roads, culverts, bridges, utility lines, service access routes, homes, businesses, town facilities, outbuildings, fences, and recreation infrastructure. Impacts may

Plan Participant	Vulnerabilities and Impacts
	include delayed emergency response, interruption of power, communications, waste service, fuel, or propane access, visitor travel disruption, business interruption, resident or visitor isolation, sediment and debris in drainage channels, localized flooding or erosion, and increased cleanup, stabilization, and repair costs.

Problem Soils

Table 85 summarizes vulnerabilities and potential impacts associated with problem soils for Garfield County participants.

Table 85: Problem Soils Vulnerability and Impact Assessment for Garfield County

Plan Participant	Vulnerabilities and Impacts
Garfield County	**Vulnerabilities:** Garfield County is vulnerable to problem soils because shallow, rocky, highly erodible, saline, gypsiferous, and locally collapsible soils occur across plateau, canyon, basin, and valley environments. Vulnerable assets include homes, schools, public buildings, emergency service facilities, roads, scenic byways, bridge approaches, culverts, water and wastewater systems, septic systems, utility corridors, agricultural lands, campgrounds, visitor-serving facilities, and access routes serving small communities and recreation destinations. Risk is elevated where development, roads, utilities, or public facilities are located in narrow valleys, along transportation corridors, on steep or erodible terrain, or in areas where moisture, runoff, irrigation, or leaking infrastructure can reduce soil strength, accelerate erosion, or dissolve gypsiferous materials. **Impacts:** Problem soils can cause foundation cracking or settlement, slab movement, septic limitations, road settlement, shoulder loss, culvert and ditch instability, erosion of unpaved surfaces, pipe breaks, corrosion, utility service interruptions, drainage problems, and higher site preparation, construction, repair, and maintenance costs. Localized failures may disrupt emergency response, school transportation, visitor travel, delivery of supplies, agricultural operations, tourism activity, and access between communities because Garfield County relies on limited transportation routes and widely distributed public services.
Town of Antimony	**Vulnerabilities:** The Town of Antimony is vulnerable to problem soils where homes, local roads, utility and communication lines, septic systems, agricultural facilities, ranch access roads, corrals, equipment pads, and drainage features are located on valley-bottom or alluvial soils that may be saline, weak, erodible, shallow, or moisture-sensitive. The town's rural setting, limited local administrative capacity, volunteer elected leadership, county-provided law enforcement, and reliance on regional utility providers may

Plan Participant	Vulnerabilities and Impacts
	increase vulnerability if soil-related damage affects access, utilities, or repair needs. **Impacts:** Problem soils could cause foundation or slab movement, septic limitations, road settlement, rutting, shoulder failure, culvert or ditch instability, pipe breaks, corrosion, erosion, and damage to agricultural support facilities. These impacts could interrupt travel, delay emergency response or utility restoration, increase maintenance and repair costs, and affect ranching or agricultural operations where soil instability, salinity, or poor drainage reduces productivity or damages infrastructure.
Town of Boulder	**Vulnerabilities:** The Town of Boulder is vulnerable to problem soils because shallow, rocky, erodible, and locally gypsiferous or moisture-sensitive soils may affect homes, small businesses, public facilities, local roads, utility corridors, septic systems, drainage crossings, campgrounds, trailheads, and recreation access routes. The town's rugged setting, steep terrain, remote location, limited redundant access, and dependence on visitor travel increase vulnerability where soil depth, erosion, runoff, or soluble soils complicate construction, maintenance, and emergency access. **Impacts:** Problem soils could cause foundation settlement, septic limitations, erosion of road shoulders and unpaved surfaces, culvert or ditch instability, utility damage, drainage problems, and higher construction and repair costs. Soil-related failures could disrupt travel, delay emergency response and service restoration, reduce access to public lands and recreation areas, affect small businesses, and increase maintenance burdens for roads, utilities, and visitor-serving facilities.
Bryce Canyon City	**Vulnerabilities:** Bryce Canyon City is vulnerable to problem soils where lodging, public facilities, roads, utilities, trailheads, campgrounds, visitor-serving infrastructure, and access routes are located on shallow, rocky, erodible, gypsiferous, or moisture-sensitive soils near Bryce Canyon-area plateau and canyon landscapes. Seasonal visitation increases exposure because transportation, lodging, utilities, and outdoor facilities must function reliably during peak use periods, even where soil limitations complicate maintenance and construction. **Impacts:** Problem soils could cause road settlement, shoulder loss, culvert instability, foundation or slab movement, septic or drainage limitations, utility damage, erosion, and higher site preparation and repair costs. Impacts to lodging, roads, utilities, campgrounds, trailheads, or visitor facilities could disrupt tourism operations, reduce visitor access, delay emergency response, and increase maintenance costs for public and private infrastructure.
Town of Cannonville	**Vulnerabilities:** The Town of Cannonville is vulnerable to problem soils where homes, town facilities, local roads, bridge approaches, culverts, utilities, septic systems, drainage features, agricultural lands, ranch access roads, corrals, barns, and equipment pads are located on shallow, erodible, saline, gypsiferous, or moisture-sensitive soils. The town's rural setting, limited administrative capacity, county-provided law enforcement, and reliance on

Plan Participant	Vulnerabilities and Impacts
	regional utility and communication providers may increase vulnerability if soil-related damage affects access routes or lifeline infrastructure. **Impacts:** Problem soils could cause foundation cracking or settlement, septic limitations, road rutting, shoulder loss, culvert and ditch instability, erosion, utility damage, pipe breaks, corrosion, and damage to agricultural support facilities. These impacts could disrupt daily travel, emergency response, utility service, ranching and agricultural operations, and access to nearby recreation routes while increasing maintenance and repair costs.
City of Escalante	**Vulnerabilities:** The City of Escalante is vulnerable to problem soils because homes, businesses, public facilities, roads, utilities, water and wastewater systems, septic systems, bridge approaches, culverts, visitor-serving facilities, and nearby agricultural lands may be located in valley, basin, and corridor settings where shallow, rocky, erodible, saline, gypsiferous, or locally collapsible soils occur. The city's role as a gateway to Grand Staircase-Escalante and Scenic Byway 12 increases vulnerability where soil limitations affect roads, utilities, lodging, fuel access, recreation access, and public services. **Impacts:** Problem soils could cause foundation settlement, slab movement, septic limitations, pavement cracking, road shoulder loss, culvert failure, drainage problems, corrosion, pipe breaks, erosion, and increased construction and maintenance costs. Soil-related failures could interrupt local government services, utilities, emergency response, visitor travel, lodging, fuel access, freight movement, and access to nearby public lands and scenic routes.
Town of Hatch	**Vulnerabilities:** The Town of Hatch is vulnerable to problem soils where homes, local roads, bridge approaches, culverts, utilities, communications, septic systems, propane service access, agricultural facilities, ranch roads, and recreation travel routes are located on shallow, erodible, saline, weak, or moisture-sensitive soils. The town's rural setting, volunteer elected leadership, county-provided law enforcement, and reliance on regional electric and fuel providers may increase vulnerability if soil-related damage affects transportation, utilities, or fuel access. **Impacts:** Problem soils could cause foundation settlement, septic limitations, road rutting or cracking, shoulder failure, culvert and ditch instability, pipe breaks, corrosion, erosion, and damage to agricultural or ranching infrastructure. Impacts may include interrupted electricity, communications, fuel or propane access, delayed emergency response, reduced access for residents and visitors, increased road and utility repair costs, and operational impacts to agricultural and ranching activities.
Town of Henrieville	**Vulnerabilities:** The Town of Henrieville is vulnerable to problem soils where homes, community facilities, local roads, drainage crossings, utilities, septic systems, agricultural lands, ranching assets, and access routes are located on shallow, erodible, saline, weak, or moisture-sensitive soils. The town's small size, limited local administrative capacity, county law enforcement support,

Plan Participant	Vulnerabilities and Impacts
	and reliance on regional utility service may increase vulnerability if soil-related damage affects access, drainage, or utility service. **Impacts:** Problem soils could cause foundation cracking or settlement, septic limitations, road settlement, shoulder loss, culvert or ditch instability, erosion, pipe breaks, corrosion, utility interruptions, and damage to ranch access roads, corrals, barns, or equipment pads. These impacts could delay emergency response and repairs, disrupt daily travel and agricultural operations, and increase costs for residents, ranchers, and local service providers.
Panguitch City	**Vulnerabilities:** The Panguitch City is vulnerable to problem soils because it contains the county seat, a concentration of residents and housing, municipal services, schools, public facilities, emergency service assets, streets, water systems, utilities, businesses, and transportation routes that may be affected by shallow, rocky, erodible, saline, gypsiferous, or locally moisture-sensitive soils. Vulnerability is heightened where buildings, roads, sidewalks, culverts, bridge approaches, buried utilities, water and wastewater infrastructure, and public facilities are located in valley or corridor settings with variable soil conditions. **Impacts:** Problem soils could cause foundation settlement, slab movement, pavement cracking, sidewalk displacement, road shoulder loss, culvert failure, septic or drainage limitations, pipe breaks, corrosion, utility interruption, and higher construction, maintenance, and repair costs. Because Panguitch concentrates county and municipal services, soil-related damage could disrupt government operations, schools, emergency response, public works, water and wastewater service, business activity, and access for nearby rural communities.
Town of Tropic	**Vulnerabilities:** The Town of Tropic is vulnerable to problem soils where residences, town facilities, local roads, sidewalks, drainage features, utilities, communications, waste service access, fuel and propane service, businesses, visitor-serving assets, septic systems, and nearby agricultural or ranching assets are located on shallow, rocky, erodible, saline, gypsiferous, or moisture-sensitive soils. The town's connection to nearby park and recreation destinations increases vulnerability where soil-related damage affects roads, utilities, lodging support, visitor travel, and service access. **Impacts:** Problem soils could cause foundation settlement, septic limitations, pavement cracking, shoulder loss, culvert or ditch instability, erosion, pipe breaks, corrosion, drainage problems, utility interruptions, and damage to visitor-serving or agricultural infrastructure. Impacts may include disrupted power, communications, waste service, fuel or propane access, delayed emergency response, reduced visitor access, business interruption, and increased maintenance and repair costs for residents, businesses, and the town.

Radon Gas

Table 86 summarizes vulnerabilities and potential impacts associated with radon gas for Garfield County participants.

Table 86: Radon Gas Vulnerability and Impact Assessment for Garfield County

Plan Participant	Vulnerabilities and Impacts
Garfield County	**Vulnerabilities:** Garfield County is vulnerable to radon exposure because radon can occur in any occupied ground-contact structure where gas generated from underlying soil and rock enters and accumulates indoors. The county is classified as EPA[191] Zone 2, indicating moderate predicted average indoor screening levels between 2 and 4 pCi/L,[192] but individual buildings may test above the EPA action level. Vulnerable assets include homes, rental housing, schools, childcare facilities, healthcare and assisted living facilities, government buildings, businesses, lodging facilities, seasonal housing, and other frequently occupied structures, especially buildings with basements, crawlspaces, slab-on-grade construction, foundation cracks, utility penetrations, or limited ventilation. **Impacts:** Radon does not typically cause physical damage to structures or infrastructure, but long-term exposure can increase cumulative lung cancer risk for residents, workers, students, visitors, and building occupants. Impacts may include public health burdens, testing and mitigation costs, delayed property transactions or occupancy decisions, temporary disruption during mitigation work, and increased outreach needs. Garfield County's dispersed rural development, older housing in small communities, visitor-serving facilities, and limited access to certified radon testing and mitigation services may prolong exposure and increase the time or cost needed to reduce risk.
Town of Antimony	**Vulnerabilities:** The Town of Antimony is vulnerable to radon exposure because radon can accumulate in any occupied ground-contact structure, including homes, rental units, public buildings, businesses, and other frequently occupied spaces. Vulnerability is higher in buildings with basements, crawlspaces, slab-on-grade construction, foundation cracks, utility penetrations, or limited ventilation. The town's rural setting, older housing stock, limited local administrative capacity, and distance from testing and mitigation providers may delay detection and corrective action. **Impacts:** Radon exposure does not typically damage structures, roads, or utilities, but long-term exposure can increase cumulative lung cancer risk for residents and other building occupants if testing and mitigation do not occur. Impacts may include household testing and mitigation costs, delayed property transactions or occupancy decisions, temporary disruption during mitigation work, and increased need for public education and access to testing resources.

[191] EPA = U.S. Environmental Protection Agency
[192] pCi/L = picocuries per liter

Plan Participant	Vulnerabilities and Impacts
Town of Boulder	**Vulnerabilities:** The Town of Boulder is vulnerable to radon exposure because any occupied building in contact with soil can accumulate radon indoors. Vulnerable assets include homes, rental housing, public facilities, small businesses, lodging or visitor-serving buildings, and other frequently occupied structures, especially those with basements, crawlspaces, slab-on-grade construction, foundation openings, utility penetrations, or limited ventilation. The town's remote setting and limited local access to certified testing or mitigation services may prolong exposure if elevated radon levels are not identified. **Impacts:** Long-term radon exposure can increase cumulative lung cancer risk for residents, workers, visitors, and building occupants, particularly where structures remain untested or unmitigated. Impacts may include costs for testing, follow-up testing, mitigation systems, and post-mitigation verification; temporary disruption to homes, businesses, or lodging during corrective work; and potential effects on housing or lodging marketability if elevated levels are identified.
Bryce Canyon City	**Vulnerabilities:** Bryce Canyon City is vulnerable to radon exposure because homes, public facilities, lodging, employee housing, businesses, and other frequently occupied buildings can accumulate radon where gas enters through foundations or other ground-contact openings. The city's visitor-serving economy increases the importance of testing and mitigation for lodging, public buildings, and employee-occupied spaces. Buildings with slab-on-grade construction, foundation cracks, utility penetrations, crawlspaces, or limited ventilation are especially susceptible. **Impacts:** Radon exposure can create long-term health risks for residents, workers, visitors, and lodging occupants if elevated levels remain undetected. Impacts may include testing and mitigation costs for public and private buildings, operational or maintenance disruptions during mitigation work, possible delays in occupancy or property transactions, and increased outreach needs for lodging operators, employers, residents, and public facility managers.
Town of Cannonville	**Vulnerabilities:** The Town of Cannonville is vulnerable to radon exposure because radon can accumulate in homes, rental units, town facilities, businesses, and other occupied ground-contact structures. Vulnerability is higher in buildings with basements, crawlspaces, slab-on-grade foundations, cracks, utility penetrations, or limited ventilation. The town's rural setting, limited administrative capacity, older or dispersed housing, and distance from testing and mitigation providers may delay detection and corrective action. **Impacts:** Radon does not cause physical damage to buildings or infrastructure, but long-term indoor exposure can increase cumulative lung cancer risk for residents, workers, and other building occupants. Impacts may include costs for testing and mitigation, delayed property transactions or occupancy decisions, temporary building-use disruptions during mitigation

Plan Participant	Vulnerabilities and Impacts
	work, and increased need for public education and access to testing resources.
City of Escalante	**Vulnerabilities:** The City of Escalante is vulnerable to radon exposure because homes, rental housing, public facilities, schools, businesses, lodging, and other frequently occupied ground-contact structures can accumulate radon indoors. Buildings with basements, crawlspaces, slab-on-grade construction, foundation cracks, utility penetrations, or limited ventilation are especially susceptible. The city's visitor-serving role and remote location may increase exposure where lodging, rental housing, or public buildings remain untested or where mitigation services are less readily available. **Impacts:** Long-term radon exposure can increase cumulative lung cancer risk for residents, workers, students, visitors, and other building occupants if elevated levels are not identified and mitigated. Impacts may include testing and mitigation costs for homeowners, landlords, public agencies, and businesses; temporary disruptions during mitigation work; delayed property transactions, occupancy, or lodging-related decisions; and increased demand for outreach, testing access, and mitigation assistance.
Town of Hatch	**Vulnerabilities:** The Town of Hatch is vulnerable to radon exposure because radon can enter and accumulate in occupied ground-contact buildings, including homes, rental units, town facilities, businesses, and other frequently occupied structures. Vulnerability is higher where buildings have basements, crawlspaces, slab-on-grade construction, foundation cracks, utility penetrations, or limited ventilation. The town's rural setting, dispersed housing, volunteer leadership, and distance from testing and mitigation providers may prolong exposure if elevated levels remain undetected. **Impacts:** Radon exposure can increase long-term lung cancer risk for residents, workers, and other occupants of untested or unmitigated buildings. Impacts may include testing and mitigation costs, temporary disruptions during mitigation installation, delayed real estate or occupancy decisions, and added need for public education, testing resources, and coordination with county or regional partners to support mitigation access.
Town of Henrieville	**Vulnerabilities:** The Town of Henrieville is vulnerable to radon exposure because any occupied building in contact with soil can accumulate radon indoors, including homes, community facilities, rental units, businesses, and other frequently occupied structures. Vulnerability is higher in buildings with basements, crawlspaces, slab-on-grade foundations, foundation cracks, utility penetrations, or limited ventilation. The town's small size, limited administrative capacity, older or dispersed housing, and reliance on outside service providers may delay testing or mitigation. **Impacts:** Long-term radon exposure can increase cumulative lung cancer risk for residents and building occupants if elevated indoor levels remain undetected. Impacts may include household or facility testing costs, mitigation expenses, temporary disruption during mitigation work, delayed

Plan Participant	Vulnerabilities and Impacts
	property or occupancy decisions, and increased need for education and outreach to encourage routine testing and reduce prolonged exposure.
Panguitch City	**Vulnerabilities:** The Panguitch City is vulnerable to radon exposure because it contains the county seat, a concentration of residents and housing, municipal services, schools, public facilities, healthcare-related facilities, businesses, lodging, and other frequently occupied ground-contact structures. Buildings with basements, crawlspaces, slab-on-grade construction, foundation cracks, utility penetrations, or limited ventilation are susceptible to radon accumulation. Because Panguitch concentrates county and municipal services, untested or unmitigated public and private buildings could expose a larger share of residents, workers, students, and visitors. **Impacts:** Radon exposure can increase cumulative lung cancer risk for residents, workers, students, visitors, and occupants of public or commercial buildings if elevated levels remain undetected. Impacts may include testing and mitigation costs for homeowners, landlords, schools, public agencies, and businesses; temporary disruptions during corrective work; delayed property transactions or occupancy decisions; and increased public health outreach needs. Because Panguitch serves as a local service center, mitigation needs in public facilities could also affect operations, budgets, and facility management priorities.
Town of Tropic	**Vulnerabilities:** The Town of Tropic is vulnerable to radon exposure because residences, rental units, town facilities, businesses, lodging-support uses, and other frequently occupied ground-contact structures can accumulate radon indoors. Vulnerability is higher where buildings have basements, crawlspaces, slab-on-grade construction, foundation cracks, utility penetrations, or limited ventilation. The town's connection to nearby recreation and park destinations increases the importance of testing and mitigation for housing, visitor-serving buildings, and worker-occupied spaces. **Impacts:** Long-term radon exposure can increase cumulative lung cancer risk for residents, workers, visitors, and other building occupants if elevated levels remain undetected. Impacts may include costs for testing, follow-up testing, mitigation, and post-mitigation verification; temporary disruption to homes, businesses, lodging-support facilities, or town buildings during mitigation work; delayed real estate or occupancy decisions; and increased need for public education and access to mitigation resources.

Thunderstorms and Lightning

Table 87 summarizes vulnerabilities and potential impacts associated with thunderstorms and lightning for Garfield County participants.

Table 87: Thunderstorms and Lightning Vulnerability and Impact Assessment for Garfield County

Plan Participant	Vulnerabilities and Impacts
Garfield County	**Vulnerabilities:** Garfield County is vulnerable to thunderstorms and lightning because seasonal convective storms affect remote communities, canyon terrain, transportation routes, recreation destinations, utilities, and large areas of public land where exposure to rapidly changing weather is high and response times may be longer. Vulnerable assets include residents, visitors, hikers, campers, boaters, travelers, homes, public facilities, campgrounds, roads, utility and communication systems, emergency response routes, tourism and recreation infrastructure, and wildland areas susceptible to dry-lightning wildfire ignition. The county's vulnerability is locally elevated in Bryce Canyon, Boulder Mountain, backcountry areas, high-elevation terrain, canyonlands, and recreation corridors where shelter, warning, and emergency access may be limited. **Impacts:** Thunderstorms and lightning can cause lightning-related injury or death, strong outflow wind damage, roof and structure damage, utility outages, communications disruption, hazardous travel, brief heavy rainfall, localized flash flooding, wildfire ignition, park or recreation closures, and delays in emergency response. Critical infrastructure impacts could include Garfield County roads, bridges, culverts, drainage infrastructure, Public Works facilities, Sheriff's Office/Jail, Garfield County Ambulance District, Garfield Memorial Hospital, schools, fire stations, water and wastewater systems, electric distribution lines, communications sites, Bryce Canyon Airport, Panguitch Municipal Airport, public buildings, campgrounds, visitor centers, lodging, and park access routes. Documented Garfield County events include lightning fatalities near Bryce Canyon and Boulder Mountain and a Cannonville thunderstorm that caused roof damage, demonstrating that even isolated storms can create disproportionate life-safety, infrastructure, tourism, and service-continuity impacts.[193]
Town of Antimony	**Vulnerabilities:** The Town of Antimony is vulnerable to thunderstorms and lightning because seasonal storms can affect residents, homes, local roads, utilities, communications, agricultural and ranching operations, livestock, open rangeland, and emergency access routes. The town's rural setting, exposed terrain, volunteer elected leadership, county-provided law enforcement, and reliance on regional electric and communication providers

[193] NOAA National Centers for Environmental Information, Storm Events Database, annual details CSV files, retrieved October 10, 2026. https://www.ncei.noaa.gov/pub/data/swdi/stormevents/csvfiles/ Lightning fatality examples: Event 345039, August 18, 2011, Bryce Canyon; Event 403653, July 21, 2012, Boulder. Cannonville wind: Event 1054501.

Plan Participant	Vulnerabilities and Impacts
	may increase vulnerability if lightning, outflow winds, brief heavy rainfall, or power disruption affects access, warning, or service restoration. **Impacts:** Thunderstorms and lightning could cause power and communication outages, lightning-related injury, wind damage to roofs, outbuildings, fences, and utility lines, hazardous travel from sudden rain or debris, localized flooding in drainages, and dry-lightning wildfire ignition. Impacts may disrupt ranching and agricultural operations, delay county emergency response, increase repair costs, and affect residents who depend on outside service providers for restoration.
Town of Boulder	**Vulnerabilities:** The Town of Boulder is vulnerable to thunderstorms and lightning because storms can develop quickly over high-elevation, canyon, and backcountry terrain where residents, visitors, hikers, campers, roads, utilities, local businesses, public facilities, and recreation access routes may be exposed. The town's remote setting, limited redundant access, volunteer emergency services, county law enforcement support, and surrounding public lands increase vulnerability where shelter, warning, communications, and emergency response access are limited. **Impacts:** Thunderstorms and lightning could cause lightning-related injury, strong outflow wind damage, utility and communication outages, hazardous travel, localized flooding, debris on roads, park or recreation access disruptions, and dry-lightning wildfire starts. Impacts may isolate residents or visitors, delay emergency response, disrupt small businesses and visitor activity, and increase demands on local and county response resources.
Bryce Canyon City	**Vulnerabilities:** Bryce Canyon City is vulnerable to thunderstorms and lightning because residents, workers, visitors, lodging, public facilities, roads, utilities, campgrounds, trailheads, and visitor-serving infrastructure may be exposed to rapidly developing storms in high-elevation and recreation-oriented areas. Vulnerability is heightened by high seasonal visitation, outdoor recreation activity, limited shelter in some recreation settings, and the documented history of lightning fatalities near Bryce Canyon. **Impacts:** Thunderstorms and lightning could cause lightning-related injury or death, wind damage to buildings, signs, roofs, utilities, and outdoor facilities, power or communication outages, hazardous travel, localized flooding, park or recreation closures, and dry-lightning wildfire ignition. Impacts to lodging, park-support services, roads, and visitor facilities could disrupt tourism operations and complicate emergency response during peak visitation periods.
Town of Cannonville	**Vulnerabilities:** The Town of Cannonville is vulnerable to thunderstorms and lightning because seasonal storms can affect residences, town facilities, local roads, utilities, communications, agricultural and ranching assets, visitors, and nearby recreation routes. The hazard profile documents a 2022 Cannonville thunderstorm that caused roof damage, demonstrating local exposure. The town's rural setting, limited administrative capacity, county-provided law enforcement, and reliance on regional utility and communication providers

Plan Participant	Vulnerabilities and Impacts
	may increase vulnerability to outages, road impacts, and delayed restoration.[194] **Impacts:** Thunderstorms and lightning could cause roof and structure damage, power and communication outages, lightning-related injury, hazardous travel, localized flash flooding, debris on roads, utility damage, and dry-lightning wildfire ignition. Impacts may disrupt residents, ranching operations, visitor travel, emergency response, and service restoration, particularly where storms affect roads or regional utility systems.
City of Escalante	**Vulnerabilities:** The City of Escalante is vulnerable to thunderstorms and lightning because residents, businesses, public facilities, roads, utilities, communications, lodging, fuel access, visitor-serving assets, and recreation travel routes may be exposed to cloud-to-ground lightning, strong outflow winds, brief heavy rainfall, and localized flooding. The city's role as a gateway to Grand Staircase-Escalante and Scenic Byway 12 increases vulnerability for visitors and outdoor recreation users who may be exposed in remote terrain with limited shelter or communications. **Impacts:** Thunderstorms and lightning could cause lightning-related injury, power and communication outages, roof, sign, and structure damage, hazardous travel, localized flooding, debris on roads, dry-lightning wildfire starts, and disruptions to public lands access. Impacts may affect local businesses, lodging, fuel access, emergency response, visitor movement, and community services if storms damage utilities, roads, or facilities.
Town of Hatch	**Vulnerabilities:** The Town of Hatch is vulnerable to thunderstorms and lightning because residents, homes, local roads, utilities, communications, propane service access, agricultural and ranching operations, livestock, and recreation travel routes may be affected by lightning, outflow winds, brief heavy rainfall, and localized flooding. The town's rural setting, volunteer elected leadership, county-provided law enforcement, and reliance on regional electric and fuel providers may increase vulnerability if storms disrupt power, communications, transportation, or fuel access. **Impacts:** Thunderstorms and lightning could cause lightning-related injury, power and communication outages, wind damage to roofs, outbuildings, fences, and utility lines, hazardous travel, localized flooding, and dry-lightning wildfire ignition. Impacts may disrupt residents, ranching operations, fuel or propane service access, visitor travel, emergency response, and restoration efforts when roads or utilities are affected.
Town of Henrieville	**Vulnerabilities:** The Town of Henrieville is vulnerable to thunderstorms and lightning because residents, homes, community facilities, local roads, utilities, communications, agricultural and ranching assets, livestock, and drainage

[194] NOAA National Centers for Environmental Information, Storm Events Database, annual details CSV files, retrieved October 10, 2026. https://www.ncei.noaa.gov/pub/data/swdi/stormevents/csvfiles/ Event 1054501, August 21, 2022, Cannonville thunderstorm wind, $20,000 reported property damage. Flash flooding is recorded separately as Event 1054504.

Plan Participant	Vulnerabilities and Impacts
	areas may be exposed to seasonal storms. The town's small size, limited local administrative capacity, county law enforcement support, and reliance on regional utility service may increase vulnerability if lightning, wind, or heavy rainfall disrupts access, power, communications, or response coordination. **Impacts:** Thunderstorms and lightning could cause lightning-related injury, wind damage to homes, outbuildings, fences, signs, and utility lines, power or communication outages, hazardous travel, localized flooding, debris in roads or drainageways, and dry-lightning wildfire starts. These impacts could delay emergency response and repairs, disrupt daily travel and ranching operations, and increase demands on county and regional service providers.
Panguitch City	**Vulnerabilities:** The Panguitch City is vulnerable to thunderstorms and lightning because it contains the county seat, a concentration of residents and housing, municipal services, schools, public facilities, emergency service assets, streets, utilities, communications, businesses, and visitor-serving facilities that may be affected by lightning, strong outflow winds, brief heavy rainfall, and localized flooding. The city's role as a local service center increases vulnerability where storms disrupt power, communications, roads, public facilities, or emergency response coordination. **Impacts:** Thunderstorms and lightning could cause lightning-related injury, roof and structure damage, downed utility lines, power and communication outages, hazardous travel, localized flooding, wildfire ignition, and interruptions to schools, government services, businesses, and emergency response. Because Panguitch concentrates county and municipal services, storm-related outages or facility damage could have broader impacts on residents, visitors, nearby rural communities, and countywide coordination.
Town of Tropic	**Vulnerabilities:** The Town of Tropic is vulnerable to thunderstorms and lightning because residences, town facilities, local roads, utilities, communications, waste service access, fuel and propane service, businesses, visitor-serving assets, recreation routes, and nearby agricultural or ranching areas may be exposed to lightning, outflow winds, brief heavy rainfall, and localized flooding. The town's connection to nearby park and recreation destinations increases exposure for visitors and outdoor recreation users during rapidly changing storm conditions. **Impacts:** Thunderstorms and lightning could cause lightning-related injury, wind damage to roofs, signs, outbuildings, fences, and utility lines, power and communication outages, hazardous travel, localized flooding, dry-lightning wildfire ignition, and disruptions to visitor travel and local businesses. Impacts may also affect waste service, fuel or propane access, emergency response, and service restoration if storms damage roads, utilities, or communication systems.

Tornadoes

Table 88 summarizes vulnerabilities and potential impacts associated with tornadoes for Garfield County participants.

Table 88: Tornadoes Vulnerability and Impact Assessment for Garfield County

Plan Participant	Vulnerabilities and Impacts
Garfield County	**Vulnerabilities:** Garfield County has low overall tornado probability but potentially moderate localized vulnerability where a tornado path intersects communities, visitor-serving areas, critical facilities, schools, transportation corridors, utility systems, agricultural assets, or older and manufactured housing. Vulnerable assets include residents, visitors, homes, manufactured or older structures, schools, public buildings, medical facilities, emergency response assets, businesses, lodging, campgrounds, U.S. 89, State Route 12, local access roads, electric distribution lines, communications systems, water and wastewater infrastructure, barns, outbuildings, fencing, irrigation systems, and vehicles. Historical records include documented tornadoes near Panguitch in 2000 and 2016, including a September 22, 2016 event that caused approximately $300,000 in property damage, damaged homes and businesses, and disrupted electric service. **Impacts:** Tornadoes could cause roof, siding, window, sign, tree, vehicle, outbuilding, agricultural structure, and utility damage; create debris hazards and roadway blockages; interrupt electric, communications, water, wastewater, public safety, school, medical, business, and visitor services; and create short-term sheltering or evacuation needs. Critical infrastructure impacts could include Garfield County roads, bridges, Public Works facilities, Sheriff's Office/Jail, Garfield County Ambulance District, Garfield Memorial Hospital, schools, fire stations, public buildings, water and wastewater systems, communications equipment, electric distribution lines, county landfill and solid waste operations, Bryce Canyon Airport, Panguitch Municipal Airport, lodging, campgrounds, and visitor-serving facilities along major routes. Cascading impacts may include delayed emergency response, utility restoration costs, business interruption, visitor sheltering needs, reduced access to medical care, disrupted tourism activity, agricultural losses, and hardship for older adults, persons with access and functional needs, lower-income households, manufactured-home residents, and visitors unfamiliar with local warning or shelter options.
Town of Antimony	**Vulnerabilities:** The Town of Antimony has low overall tornado probability but localized vulnerability where a tornado or landspout-type event intersects homes, older or manufactured housing, local roads, utilities, communications, ranch infrastructure, agricultural buildings, vehicles, and residents or workers with limited shelter options. The town's rural setting, dispersed development, volunteer elected leadership, county-provided law enforcement, and reliance on regional utility and communication providers may increase vulnerability if warning, sheltering, access, or restoration is delayed.

Plan Participant	Vulnerabilities and Impacts
	Impacts: Tornadoes could damage roofs, siding, windows, outbuildings, fences, vehicles, agricultural structures, utility poles, and communications equipment; create debris hazards on local roads; interrupt electric or communication service; and require short-term sheltering or cleanup. Impacts may delay county emergency response, disrupt ranching and agricultural operations, increase repair costs, and create hardship for older adults, persons with access and functional needs, lower-income households, manufactured-home residents, and residents with limited access to substantial shelter.
Town of Boulder	**Vulnerabilities:** The Town of Boulder has low overall tornado probability but localized vulnerability where a tornado path intersects residences, small businesses, public facilities, utilities, local roads, visitor-serving assets, campgrounds, recreation access routes, older structures, or residents and visitors with limited shelter options. The town's remote setting, limited redundant access, volunteer emergency services, county law enforcement support, and seasonal outdoor recreation activity may increase vulnerability if warning, sheltering, emergency response, or utility restoration is delayed. **Impacts:** Tornadoes could damage roofs, siding, windows, signs, vehicles, outbuildings, utility lines, communications equipment, trees, and recreation facilities; create debris hazards; block local roads or Scenic Byway 12 access; and interrupt power, communications, visitor services, and emergency response. Impacts may include temporary isolation of residents or visitors, business interruption, sheltering needs, longer detours, repair costs, and increased risk for visitors unfamiliar with local warning and sheltering practices.
Bryce Canyon City	**Vulnerabilities:** Bryce Canyon City has low overall tornado probability but localized vulnerability where tornado-related wind damage affects lodging, employee housing, public facilities, roads, utilities, visitor-serving businesses, campgrounds, vehicles, signs, and outdoor recreation areas. The city's visitor-serving economy, high seasonal visitation, and potential for visitors to be unfamiliar with local warning and shelter options increase vulnerability during short-notice severe thunderstorm events. **Impacts:** Tornadoes could damage roofs, siding, windows, signs, lodging facilities, vehicles, utility lines, communications equipment, public facilities, and recreation infrastructure; create debris hazards; interrupt power and communications; and disrupt visitor travel, lodging operations, park-support services, and emergency access. Impacts may include visitor sheltering needs, delayed response, business interruption, cleanup costs, and greater consequences where a localized tornado affects peak visitation areas.
Town of Cannonville	**Vulnerabilities:** The Town of Cannonville has low overall tornado probability but localized vulnerability where a tornado path intersects residences, older or manufactured housing, town facilities, local roads, utilities, communications, agricultural buildings, ranch infrastructure, vehicles, and nearby visitor routes. The town's rural setting, limited administrative capacity, county-provided law enforcement, and reliance on regional utility and communication providers

Plan Participant	Vulnerabilities and Impacts
	may increase vulnerability if severe wind damage disrupts access, warning, response, or restoration. **Impacts:** Tornadoes could damage roofs, siding, windows, signs, outbuildings, fences, vehicles, agricultural structures, utility poles, and communications equipment; create debris hazards and roadway blockages; interrupt electric or communication service; and require cleanup or short-term sheltering. Impacts may disrupt residents, ranching operations, visitor travel, emergency response, utility restoration, and local services, especially where road access or lifeline systems are affected.
City of Escalante	**Vulnerabilities:** The City of Escalante has low overall tornado probability but localized vulnerability where tornado-related wind damage affects residents, homes, older or manufactured structures, businesses, public facilities, schools, roads, utilities, communications, visitor-serving facilities, vehicles, and recreation access routes. The city's role as a gateway to Grand Staircase-Escalante and Scenic Byway 12 increases vulnerability where residents, visitors, lodging, fuel access, public lands access, and emergency response depend on exposed roads and lifeline systems. **Impacts:** Tornadoes could damage roofs, siding, windows, signs, trees, vehicles, outbuildings, public facilities, utility lines, and communications equipment; create debris hazards; block roads; interrupt power, communications, business operations, public services, and visitor travel; and require short-term sheltering or cleanup. Impacts may include delayed emergency response, disrupted lodging or fuel access, business interruption, reduced access to public lands, and hardship for older adults, persons with access and functional needs, lower-income households, manufactured-home residents, and visitors unfamiliar with local shelter options.
Town of Hatch	**Vulnerabilities:** The Town of Hatch has low overall tornado probability but localized vulnerability where a tornado or landspout-type event intersects homes, older or manufactured housing, local roads, utilities, communications, propane and fuel access, agricultural buildings, ranching assets, vehicles, and recreation travel routes. The town's rural setting, volunteer elected leadership, county-provided law enforcement, and reliance on regional electric and fuel providers may increase vulnerability if severe wind damage disrupts access, sheltering, power, communications, or fuel service. **Impacts:** Tornadoes could damage roofs, siding, windows, signs, vehicles, outbuildings, fences, agricultural structures, utility poles, fuel-related facilities, and communications equipment; create debris hazards on local roads; interrupt electricity, communications, fuel, or propane access; and delay emergency response or restoration. Impacts may disrupt residents, ranching operations, visitor travel, and daily services while increasing repair costs and short-term sheltering needs.

Plan Participant	Vulnerabilities and Impacts
Town of Henrieville	**Vulnerabilities:** The Town of Henrieville has low overall tornado probability but localized vulnerability where tornado-related wind damage affects homes, older or manufactured structures, community facilities, local roads, utilities, communications, agricultural buildings, ranching assets, vehicles, and residents with limited shelter options. The town's small size, limited local administrative capacity, county law enforcement support, and reliance on regional utility service may increase vulnerability if warning, access, response, or repairs are delayed. **Impacts:** Tornadoes could damage roofs, siding, windows, signs, outbuildings, fences, vehicles, utility poles, communications equipment, and agricultural or ranching infrastructure; create debris hazards and local road blockages; interrupt power or communications; and require cleanup or temporary sheltering. Impacts may delay emergency response, disrupt daily travel and ranching operations, increase repair costs, and create added hardship for older adults, persons with access and functional needs, lower-income households, and manufactured-home residents.
Panguitch City	**Vulnerabilities:** The Panguitch City has localized tornado vulnerability because it contains the county seat, a concentration of residents and housing, schools, municipal services, public facilities, medical and emergency service access, businesses, utilities, communications systems, streets, transportation routes, and visitor-serving facilities. Historical tornadoes near Panguitch, including the damaging September 22, 2016 event, demonstrate that tornado-related wind damage can affect homes, businesses, vehicles, trees, power lines, and community services. Older structures, manufactured housing, large-span buildings, schools, and public facilities are important local vulnerabilities. **Impacts:** Tornadoes could damage homes, schools, public buildings, businesses, roofs, siding, windows, signs, vehicles, trees, outbuildings, utility poles, and communications equipment; block roads with debris; interrupt power, communications, water, wastewater, government operations, emergency response, school functions, medical access, and business activity; and create sheltering or evacuation needs. Because Panguitch concentrates county and municipal services, impacts could extend beyond the immediate damage path by delaying countywide coordination, visitor support, utility restoration, and access for nearby rural communities.
Town of Tropic	**Vulnerabilities:** The Town of Tropic has low overall tornado probability but localized vulnerability where tornado-related wind damage affects residences, older or manufactured structures, town facilities, local roads, utilities, communications, waste service access, fuel and propane service, businesses, visitor-serving assets, vehicles, signs, outbuildings, and nearby agricultural or ranching assets. The town's connection to nearby park and recreation destinations increases exposure for visitors who may be unfamiliar with local warning practices or lack immediate access to substantial shelter.

Plan Participant	Vulnerabilities and Impacts
	Impacts: Tornadoes could damage roofs, siding, windows, signs, vehicles, outbuildings, fences, utility lines, communications equipment, and service access routes; create debris hazards; interrupt power, communications, waste service, fuel, or propane availability; disrupt local businesses and visitor travel; and require short-term sheltering or cleanup. Impacts may delay emergency response and restoration if roads or lifelines are blocked, while creating added hardship for residents, visitors, older adults, persons with access and functional needs, and households in older or manufactured housing.

Wildfire

Table 89 summarizes vulnerabilities and potential impacts associated with wildfire for Garfield County participants.

Table 89: Wildfire Vulnerability and Impact Assessment for Garfield County

Plan Participant	Vulnerabilities and Impacts
Garfield County	**Vulnerabilities:** Garfield County is highly vulnerable to wildfire because extensive grass, shrub, pinyon-juniper, and forest fuels overlap with dispersed communities, visitor destinations, transportation corridors, utilities, grazing lands, watersheds, public lands, and critical facilities. Vulnerable assets include approximately 5,256 residents, 3,803 housing units, seasonal workers, visitors, homes, businesses, lodges, campgrounds, schools, government buildings, emergency response facilities, Garfield Memorial Hospital, highways and local roads, bridges, power lines, substations, communications sites, water systems, grazing areas, watersheds, scenic landscapes, and recreation assets. Vulnerability is heightened in wildland-urban interface areas around Panguitch, Escalante, Boulder, Hatch, Tropic, Bryce Canyon-area destinations, and other communities where limited access routes, rugged terrain, high seasonal visitation, and dry, windy fire-weather conditions can complicate warning, evacuation, response, and recovery. **Impacts:** Wildfire could cause injury or loss of life, evacuations, structure and outbuilding loss, damage to lodges, campgrounds, public facilities, fencing, utilities, communications equipment, roads, and water system components, and closures of routes needed for evacuation, emergency access, resident travel, and visitor movement. Critical infrastructure impacts could include Garfield County roads and bridges, Public Works road and drainage assets, Sheriff's Office/Jail, Garfield County Ambulance District, Garfield Memorial Hospital, schools, fire stations, county public buildings, water and wastewater systems, power distribution, communications sites, county landfill and solid waste operations, Bryce Canyon Airport, Panguitch Municipal Airport, campgrounds, trailheads, visitor centers, lodging, and park gateway facilities. Indirect and cascading impacts may include smoke-related public health effects, school and facility closures, power and communication outages,

Plan Participant	Vulnerabilities and Impacts
	tourism and recreation losses, business interruption, reduced grazing capacity, watershed degradation, erosion, sedimentation, post-fire flooding, debris flows, and long-term recovery costs. Recent Garfield County wildfire experience, including the Mammoth Fire and France Canyon Fire, demonstrates the potential for smoke impacts, public land closures, difficult terrain, and threats to recreation communities and visitor-serving areas.
Town of Antimony	**Vulnerabilities:** The Town of Antimony is vulnerable to wildfire because residences, ranching operations, agricultural buildings, outbuildings, grazing lands, local roads, utilities, communications, and emergency access routes may be located near grass, shrub, rangeland, and other burnable fuels. The town's rural setting, dispersed development, volunteer elected leadership, county-provided law enforcement, and reliance on regional utility and communication providers may increase vulnerability if wildfire, smoke, evacuation needs, or utility disruption affects access, warning, or service restoration. **Impacts:** Wildfire could threaten homes, outbuildings, livestock facilities, fencing, grazing lands, power lines, communications equipment, and local access routes; require evacuations; disrupt ranching and agricultural operations; and create smoke impacts for residents, older adults, outdoor workers, and people with respiratory conditions. Cascading impacts may include power or communication outages, delayed emergency response, livestock movement challenges, loss of forage, erosion, sedimentation, post-fire flooding, debris flows, and increased recovery costs for residents and ranching operations.
Town of Boulder	**Vulnerabilities:** The Town of Boulder is vulnerable to wildfire because homes, small businesses, public facilities, utilities, local roads, campgrounds, trailheads, recreation access routes, and surrounding public lands are located near grass, shrub, pinyon-juniper, and forest fuels. The town's remote setting, rugged terrain, limited redundant access, volunteer emergency services, county law enforcement support, and high use of nearby recreation areas may increase vulnerability where wildfire or smoke affects evacuation, emergency access, utility service, visitor movement, or local businesses. **Impacts:** Wildfire could threaten homes, businesses, public facilities, utility lines, roads, campgrounds, trailheads, grazing areas, and recreation access routes; require evacuations; close roads or public lands; and disrupt visitor travel and local commerce. Cascading impacts may include smoke-related health effects, power and communication outages, delayed response and reentry, business interruption, reduced recreation access, watershed degradation, erosion, sedimentation, post-fire flooding, debris flows, and long-term road, utility, and slope stabilization costs.
Bryce Canyon City	**Vulnerabilities:** Bryce Canyon City is highly vulnerable to wildfire because lodging, employee housing, public facilities, roads, utilities, campgrounds, visitor-serving infrastructure, and recreation access routes are located near grass, shrub, pinyon-juniper, and forest fuels in the Bryce Canyon area.

Plan Participant	Vulnerabilities and Impacts
	Vulnerability is heightened by high seasonal visitation, dependence on lodging and park-support services, limited access routes, nearby public lands, and the potential for wildfire smoke, closures, or evacuation needs to affect residents, workers, and visitors. **Impacts:** Wildfire could threaten lodging, employee housing, public facilities, campgrounds, utility systems, roads, signs, and visitor-serving infrastructure; require evacuations; close roads or recreation areas; and disrupt tourism operations during peak visitation periods. Cascading impacts may include smoke-related health effects, power and communication outages, delayed emergency response and reentry, loss of visitor revenue, reduced access to Bryce Canyon-area destinations, erosion, sedimentation, post-fire flooding, debris flows, and increased costs for recovery, slope stabilization, and public information.
Town of Cannonville	**Vulnerabilities:** The Town of Cannonville is vulnerable to wildfire because homes, town facilities, local roads, utilities, communications, agricultural and ranching assets, grazing lands, nearby recreation routes, and surrounding public lands may be located near grass, shrub, pinyon-juniper, and other burnable fuels. The town's rural setting, limited administrative capacity, county-provided law enforcement, and reliance on regional utility and communication providers may increase vulnerability where wildfire, smoke, road closures, evacuation needs, or utility disruption affect access and response. **Impacts:** Wildfire could threaten homes, outbuildings, town facilities, fences, livestock facilities, grazing lands, utilities, communications equipment, and local access routes; require evacuations; disrupt ranching and agricultural operations; and affect visitor travel to nearby recreation areas. Cascading impacts may include smoke-related public health effects, power or communication outages, delayed emergency response and reentry, business interruption, loss of forage, erosion, sedimentation, post-fire flooding, debris flows, and increased cleanup and recovery costs.
City of Escalante	**Vulnerabilities:** The City of Escalante is highly vulnerable to wildfire because homes, businesses, public facilities, roads, utilities, communications, lodging, fuel access, visitor-serving assets, agricultural and ranching operations, and recreation access routes are located near grass, shrub, pinyon-juniper, forest fuels, and surrounding public lands. The city's role as a gateway to Grand Staircase-Escalante and Scenic Byway 12 increases vulnerability where wildfire, smoke, public land closures, utility disruption, or evacuation needs affect visitor travel, local commerce, emergency response, and access to remote recreation areas. **Impacts:** Wildfire could threaten homes, businesses, public facilities, lodging, fuel access, roads, utility systems, communications equipment, grazing lands, campgrounds, trailheads, and recreation routes; require evacuations; close roads and public lands; and disrupt tourism, local services, and agricultural operations. Cascading impacts may include smoke-related health effects,

Plan Participant	Vulnerabilities and Impacts
	power and communication outages, business interruption, reduced visitor access, delayed emergency response and reentry, watershed degradation, erosion, sedimentation, post-fire flooding, debris flows, and long-term infrastructure and natural resource recovery costs.
Town of Hatch	**Vulnerabilities:** The Town of Hatch is vulnerable to wildfire because residences, local roads, utilities, communications, propane and fuel access, agricultural facilities, ranching assets, grazing lands, recreation travel routes, and surrounding vegetation may be exposed to grass, shrub, pinyon-juniper, and forest fuels. The town's rural setting, volunteer elected leadership, county-provided law enforcement, and reliance on regional electric and fuel providers may increase vulnerability if wildfire, smoke, evacuations, road closures, or utility disruption affect access, warning, sheltering, or service restoration. **Impacts:** Wildfire could threaten homes, outbuildings, livestock facilities, fencing, grazing lands, roads, fuel or propane access, power lines, communications equipment, and recreation travel routes; require evacuations; and disrupt residents, visitors, and ranching operations. Cascading impacts may include smoke-related health effects, power or communication outages, delayed emergency response and reentry, fuel or propane service interruption, loss of forage, erosion, sedimentation, post-fire flooding, debris flows, and increased recovery costs for residents, producers, and service providers.
Town of Henrieville	**Vulnerabilities:** The Town of Henrieville is vulnerable to wildfire because homes, community facilities, local roads, utilities, communications, agricultural and ranching assets, grazing lands, and surrounding vegetation may be exposed to grass, shrub, pinyon-juniper, and other burnable fuels. The town's small size, limited local administrative capacity, county law enforcement support, and reliance on regional utility service may increase vulnerability if wildfire, smoke, evacuation needs, road closures, or utility disruption affect warning, access, response, or restoration. **Impacts:** Wildfire could threaten homes, outbuildings, fences, livestock facilities, grazing lands, utility lines, communications equipment, local roads, and community facilities; require evacuations; disrupt ranching and agricultural operations; and create smoke impacts for residents, older adults, outdoor workers, and people with respiratory conditions. Cascading impacts may include delayed emergency response and reentry, power or communication outages, loss of forage, erosion, sedimentation, post-fire flooding, debris flows, and increased recovery costs for residents, ranchers, and local service providers.
Panguitch City	**Vulnerabilities:** The Panguitch City is highly vulnerable to wildfire because it contains the county seat, a concentration of residents and housing, schools, municipal services, public facilities, Garfield Memorial Hospital, emergency response assets, businesses, roads, utilities, communications systems, water infrastructure, visitor-serving facilities, and nearby agricultural and ranching

Plan Participant	Vulnerabilities and Impacts
	assets that may be affected by fire, smoke, evacuation needs, or utility disruption. Vulnerability is heightened by nearby WUI conditions, regional travel routes, surrounding grass, shrub, pinyon-juniper, and forest fuels, and recent regional wildfire experience, including the 2021 Mammoth Fire.[195][196] **Impacts:** Wildfire could threaten homes, schools, public buildings, medical facilities, businesses, outbuildings, roads, utilities, communications equipment, water systems, grazing lands, and visitor-serving facilities; require evacuations; close roads; and disrupt government operations, emergency response, healthcare access, schools, local businesses, and visitor travel. Because Panguitch concentrates county and municipal services, cascading impacts may include smoke-related health effects, power and communication outages, delayed reentry and restoration, business interruption, countywide coordination challenges, reduced tourism activity, watershed degradation, erosion, sedimentation, post-fire flooding, debris flows, and long-term recovery costs.
Town of Tropic	**Vulnerabilities:** The Town of Tropic is vulnerable to wildfire because residences, town facilities, local roads, utilities, communications, waste service access, fuel and propane service, businesses, visitor-serving assets, agricultural and ranching areas, recreation routes, and surrounding vegetation may be exposed to grass, shrub, pinyon-juniper, and forest fuels. The town's connection to nearby park and recreation destinations increases exposure for residents, businesses, visitors, and service providers when wildfire, smoke, closures, or evacuation needs affect travel routes and service access. **Impacts:** Wildfire could threaten homes, businesses, town facilities, outbuildings, fencing, grazing lands, roads, utility lines, communications equipment, waste service access, fuel or propane service, and visitor-serving infrastructure; require evacuations; close roads or recreation areas; and disrupt local businesses and visitor travel. Cascading impacts may include smoke-related health effects, power and communication outages, delayed emergency response and reentry, service interruption, business interruption, reduced recreation access, loss of forage, erosion, sedimentation, post-fire flooding, debris flows, and increased recovery costs for residents, businesses, and the town.

[195] WUI = wildland-urban interface

[196] FEMA, OpenFEMA Disaster Declarations Summaries, version 2, Utah records, retrieved October 10, 2026. https://www.fema.gov/openfema-data-page/disaster-declarations-summaries-v2 FM-5388-UT, Mammoth Fire, June 8, 2021, Garfield County.

Winter Storms

Table 90 summarizes vulnerabilities and potential impacts associated with winter storms for Garfield County participants.

Table 90: Winter Storms Vulnerability and Impact Assessment for Garfield County

Plan Participant	Vulnerabilities and Impacts
Garfield County	**Vulnerabilities:** Garfield County is highly vulnerable to winter storms because its extensive high-elevation terrain, dispersed settlement pattern, remote road network, limited transportation redundancy, and reliance on a small number of critical road corridors expose residents, visitors, housing, public facilities, schools, Garfield Memorial Hospital, utilities, communications systems, water and wastewater systems, tourism services, agricultural operations, and emergency response functions to heavy snow, blowing and drifting snow, black ice, freezing rain, and prolonged cold. Vulnerability is highest on Boulder Mountain, the Aquarius Plateau, U.S. Highway 89, State Route 12, State Route 22, State Route 24, and other remote mountain and community access routes where closures, reduced visibility, icy roads, and extended snow cover can isolate communities and delay services. **Impacts:** Winter storms could cause dangerous or impossible travel, crashes, road closures, delayed emergency response, school and facility closures, power and communication outages, heating interruptions, frozen or burst pipes, roof stress from heavy snow, tree limb damage, and disruption to freight, medical access, tourism, agriculture, ranching, and daily community operations. Critical infrastructure impacts could include Garfield County roads, highways, bridges, Public Works snow removal and road treatment assets, Sheriff's Office/Jail, Garfield County Ambulance District, Garfield Memorial Hospital, schools, fire stations, public buildings, water and wastewater systems, electric distribution lines, communications equipment, county landfill and solid waste operations, Bryce Canyon Airport, Panguitch Municipal Airport, lodging, campgrounds, visitor centers, fuel and propane access points, and major winter travel routes including U.S. 89, SR-12, SR-22, SR-24, SR-63, and SR-143. Cascading impacts may include isolation of rural residents and visitors, delayed deliveries, reduced access to healthcare and supplies, business interruption, increased snow removal and emergency response costs, and heightened risk for older adults, medically vulnerable residents, stranded travelers, livestock operations, and households with limited heating or backup power.
Town of Antimony	**Vulnerabilities:** The Town of Antimony is vulnerable to winter storms because residents, older adults, homes, local roads, utilities, communications, agricultural and ranching operations, livestock, and emergency access routes may be affected by snow, ice, blowing snow, freezing temperatures, and prolonged cold. The town's rural setting, dispersed development, volunteer elected leadership, county-provided law enforcement, and reliance on regional utility and communication providers may increase vulnerability if

Plan Participant	Vulnerabilities and Impacts
	roads become hazardous, power or communications are disrupted, heating is interrupted, or outside assistance is delayed. **Impacts:** Winter storms could cause hazardous or impassable roads, delayed emergency response, power and communication outages, heating interruptions, frozen pipes, livestock care challenges, disrupted ranching and agricultural operations, and reduced access to medical care, supplies, schools, and services. Cascading impacts may include temporary isolation of residents, delayed utility restoration, fuel or supply delivery delays, increased snow removal needs, and heightened risk for older adults, medically vulnerable residents, stranded travelers, outdoor workers, and households with limited backup heat or power.
Town of Boulder	**Vulnerabilities:** The Town of Boulder is highly vulnerable to winter storms because its high-elevation and remote setting, limited redundant access, local roads, utilities, public facilities, residences, small businesses, visitor-serving assets, and recreation access routes may be affected by heavy snow, drifting snow, black ice, reduced visibility, freezing rain, and prolonged cold. Winter storm vulnerability is elevated where routes across Boulder Mountain, Scenic Byway 12, and other remote road connections are affected by closures or hazardous travel, limiting access for residents, emergency responders, utility crews, visitors, and service providers. **Impacts:** Winter storms could isolate residents or visitors, close or restrict access routes, delay emergency response, disrupt utility and communication service, interrupt business and visitor travel, and create heating, water, and supply challenges. Impacts may include hazardous driving, crashes, frozen or burst pipes, roof stress from snow loading, power outages, school or facility closures, delayed deliveries, reduced recreation access, stranded travelers, and increased costs for snow removal, road treatment, utility restoration, and emergency response.
Bryce Canyon City	**Vulnerabilities:** Bryce Canyon City is highly vulnerable to winter storms because residents, workers, visitors, lodging, public facilities, roads, utilities, campgrounds, and visitor-serving infrastructure are located in a high-elevation area where snow, ice, blowing snow, low visibility, freezing temperatures, and prolonged cold can affect travel and service continuity. Seasonal and winter visitation increases exposure for travelers who may be unfamiliar with local winter driving conditions, road closures, high-elevation weather, and limited shelter or service options during severe weather. **Impacts:** Winter storms could cause hazardous travel, visitor delays, road closures, power or communication outages, heating interruptions, frozen pipes, facility closures, and disruptions to lodging, park-support services, emergency response, and visitor movement. Cascading impacts may include stranded visitors, increased demand for public information and sheltering support, delayed deliveries, reduced tourism activity, utility restoration challenges, interruptions to employee access, and increased snow removal and road treatment costs.

Plan Participant	Vulnerabilities and Impacts
Town of Cannonville	**Vulnerabilities:** The Town of Cannonville is vulnerable to winter storms because residences, town facilities, local roads, utilities, communications, agricultural and ranching assets, visitors, and nearby recreation routes may be affected by snow, ice, freezing temperatures, reduced visibility, and prolonged cold. The town's rural setting, limited administrative capacity, county-provided law enforcement, and reliance on regional utility and communication providers may increase vulnerability if roads become hazardous, outages occur, heating is interrupted, or response and restoration resources must travel from outside the community. **Impacts:** Winter storms could cause hazardous roads, crashes, delayed emergency response, school or facility closures, power and communication outages, heating interruptions, frozen pipes, livestock care challenges, and disruption to daily travel, ranching operations, visitor movement, and supply deliveries. Cascading impacts may include temporary isolation, delayed utility restoration, increased snow removal needs, business interruption, reduced access to services, and heightened risk for older adults, medically vulnerable residents, travelers, and households with limited backup heat or power.
City of Escalante	**Vulnerabilities:** The City of Escalante is vulnerable to winter storms because residents, businesses, public facilities, schools, roads, utilities, communications, lodging, fuel access, visitor-serving assets, agricultural and ranching operations, and recreation travel routes may be affected by snow, ice, black ice, reduced visibility, freezing temperatures, and prolonged cold. The city's role as a gateway to Grand Staircase-Escalante and Scenic Byway 12 increases vulnerability where winter conditions affect visitor travel, fuel access, emergency response, freight movement, local services, and access to remote public lands. **Impacts:** Winter storms could cause hazardous travel, crashes, road closures, delayed emergency response, power and communication outages, heating interruptions, frozen pipes, school or public facility closures, and disruption to local businesses, lodging, fuel access, agricultural operations, and visitor movement. Cascading impacts may include delayed deliveries, reduced access to medical care and supplies, stranded travelers, business interruption, increased snow removal and road treatment costs, and heightened risk for older adults, medically vulnerable residents, visitors, and households with limited backup heat or power.
Town of Hatch	**Vulnerabilities:** The Town of Hatch is vulnerable to winter storms because residents, homes, local roads, utilities, communications, propane and fuel access, agricultural and ranching operations, livestock, and recreation travel routes may be affected by snow, ice, reduced visibility, freezing temperatures, and prolonged cold. The town's rural setting, volunteer elected leadership, county-provided law enforcement, and reliance on regional electric and fuel providers may increase vulnerability if winter weather disrupts roads, power, communications, heating fuel access, propane service, or emergency response.

Plan Participant	Vulnerabilities and Impacts
	Impacts: Winter storms could cause hazardous or impassable roads, crashes, delayed emergency response, power and communication outages, heating interruptions, frozen pipes, fuel or propane service disruption, livestock care challenges, and disruption to ranching operations and visitor travel. Cascading impacts may include temporary isolation, delayed deliveries, reduced access to medical care or supplies, increased snow removal needs, delayed utility restoration, and heightened risk for older adults, medically vulnerable residents, travelers, outdoor workers, and households with limited backup heat or power.
Town of Henrieville	**Vulnerabilities:** The Town of Henrieville is vulnerable to winter storms because residents, older adults, homes, community facilities, local roads, utilities, communications, agricultural and ranching assets, livestock, and access routes may be affected by snow, ice, freezing temperatures, black ice, reduced visibility, and prolonged cold. The town's small size, limited local administrative capacity, county law enforcement support, and reliance on regional utility service may increase vulnerability if winter weather delays response, access, repairs, heating, or service restoration. **Impacts:** Winter storms could cause hazardous roads, crashes, delayed emergency response, power or communication outages, heating interruptions, frozen pipes, livestock care challenges, school or facility closures, and disruption to daily travel, ranching operations, and supply deliveries. Cascading impacts may include temporary isolation, delayed utility restoration, increased snow removal needs, reduced access to medical care and supplies, and heightened risk for older adults, medically vulnerable residents, stranded travelers, outdoor workers, and households with limited backup heat or power.
Panguitch City	**Vulnerabilities:** The Panguitch City is highly vulnerable to winter storms because it contains the county seat, a concentration of residents and housing, schools, municipal services, Garfield Memorial Hospital, emergency response assets, public facilities, streets, utilities, communications systems, water and wastewater infrastructure, businesses, and transportation routes that may be affected by heavy snow, black ice, blowing snow, reduced visibility, freezing temperatures, and prolonged cold. Panguitch's role as a county service center increases vulnerability where winter weather affects U.S. Highway 89, State Route 143, local streets, emergency access, medical access, schools, government operations, utility service, and countywide coordination. **Impacts:** Winter storms could cause dangerous travel, crashes, road closures, delayed emergency response, school and public facility closures, power and communication outages, heating interruptions, frozen or burst pipes, roof stress from heavy snow, and disruption to government, healthcare, business, freight, and visitor services. Because Panguitch concentrates county and municipal services, cascading impacts may include reduced access to Garfield Memorial Hospital, delayed countywide coordination, delayed deliveries, business interruption, increased snow removal and road treatment costs, and

Plan Participant	Vulnerabilities and Impacts
	heightened risk for older adults, medically vulnerable residents, stranded travelers, students, and households with limited backup heat or power.
Town of Tropic	**Vulnerabilities:** The Town of Tropic is vulnerable to winter storms because residences, town facilities, local roads, utilities, communications, waste service access, fuel and propane service, businesses, visitor-serving assets, nearby agricultural or ranching areas, and recreation travel routes may be affected by snow, ice, freezing temperatures, reduced visibility, and prolonged cold. The town's connection to nearby park and recreation destinations increases exposure for residents, businesses, visitors, and service providers when winter weather affects travel routes, utility service, heating fuel access, and service continuity. **Impacts:** Winter storms could cause hazardous roads, crashes, delayed emergency response, power and communication outages, heating interruptions, frozen pipes, waste service delays, fuel or propane access disruption, school or facility closures, and disruption to local businesses and visitor travel. Cascading impacts may include temporary isolation, delayed deliveries, reduced access to medical care or supplies, increased snow removal and road treatment needs, business interruption, delayed utility restoration, and heightened risk for older adults, medically vulnerable residents, stranded visitors, outdoor workers, and households with limited backup heat or power.

Changes in Development

This plan update considers whether development since the previous plan has changed each participant's vulnerability. A change in population, construction, tourism, or economic activity does not by itself establish increased or decreased vulnerability. The determination must consider where development occurred, the relevant hazard area, applicable design and land-use controls, infrastructure capacity, and whether exposure or expected consequences changed.

Garfield County's population increased from 5,083 in the 2020 Census to an estimated 5,256 on July 1, 2025. The county recorded 27 building permits in 2025. These figures indicate modest growth but do not show where new development occurred relative to hazard areas. Demographic characteristics and seasonal visitation influence consequence and service-demand considerations, but they do not independently demonstrate a change in hazard vulnerability.[197]

Future development could increase exposure if people, structures, utilities, visitor facilities, or access routes are added in flood-prone areas, the wildland-urban interface, unstable or problem-soil areas, dam-inundation areas, or locations with limited water, power, transportation, or emergency-service

[197] U.S. Census Bureau, QuickFacts: Garfield County, Utah, 2020 Census, V2025 population/housing estimates, 2020-2024 ACS, 2022 Economic Census, and 2025 building permits. https://www.census.gov/quickfacts/fact/table/garfieldcountyutah/PST045225. Accessed October 9, 2026.

redundancy. Development review, zoning, subdivision requirements, building-code administration, geotechnical investigation, floodplain management, water planning, emergency access, and capital programming can reduce or avoid added risk. Proposed development is not treated as existing exposure.

Table 91 distinguishes potential effects of future development from observed changes since the previous plan. The available records do not identify development locations, jurisdiction-owned assets outside the planning area, or completed mitigation by participant sufficiently to determine increased, unchanged, or decreased vulnerability. An indeterminate finding is not a finding of unchanged vulnerability.

Table 91: Vulnerability Changes in Garfield County

Plan Participant	Increased	Stayed the Same	Decreased
Garfield County	Development, infrastructure investment, seasonal visitation, or growth in or near documented hazard-prone areas may increase exposure where new people or assets are added. No participant-specific observed increase is established.	Indeterminate: available participant-specific development and mitigation records do not establish whether vulnerability stayed the same.	No decrease is established by the available participant-specific records.
Town of Antimony	Development, infrastructure investment, seasonal visitation, or growth in or near documented hazard-prone areas may increase exposure where new people or assets are added. No participant-specific observed increase is established.	Indeterminate: available participant-specific development and mitigation records do not establish whether vulnerability stayed the same.	No decrease is established by the available participant-specific records.
Town of Boulder	Development, infrastructure investment, seasonal visitation, or growth in or near documented hazard-prone areas may increase exposure where new people or assets are added. No participant-specific observed increase is established.	Indeterminate: available participant-specific development and mitigation records do not establish whether vulnerability stayed the same.	No decrease is established by the available participant-specific records.

Plan Participant	Increased	Stayed the Same	Decreased
Bryce Canyon City	Development, infrastructure investment, seasonal visitation, or growth in or near documented hazard-prone areas may increase exposure where new people or assets are added. No participant-specific observed increase is established.	Indeterminate: available participant-specific development and mitigation records do not establish whether vulnerability stayed the same.	No decrease is established by the available participant-specific records.
Town of Cannonville	Development, infrastructure investment, seasonal visitation, or growth in or near documented hazard-prone areas may increase exposure where new people or assets are added. No participant-specific observed increase is established.	Indeterminate: available participant-specific development and mitigation records do not establish whether vulnerability stayed the same.	No decrease is established by the available participant-specific records.
City of Escalante	Development, infrastructure investment, seasonal visitation, or growth in or near documented hazard-prone areas may increase exposure where new people or assets are added. No participant-specific observed increase is established.	Indeterminate: available participant-specific development and mitigation records do not establish whether vulnerability stayed the same.	No decrease is established by the available participant-specific records.
Town of Hatch	Development, infrastructure investment, seasonal visitation, or growth in or near documented hazard-prone areas may increase exposure where new people or assets are added. No participant-specific observed increase is established.	Indeterminate: available participant-specific development and mitigation records do not establish whether vulnerability stayed the same.	No decrease is established by the available participant-specific records.

Plan Participant	Increased	Stayed the Same	Decreased
Town of Henrieville	Development, infrastructure investment, seasonal visitation, or growth in or near documented hazard-prone areas may increase exposure where new people or assets are added. No participant-specific observed increase is established.	Indeterminate: available participant-specific development and mitigation records do not establish whether vulnerability stayed the same.	No decrease is established by the available participant-specific records.
Panguitch City	Development, infrastructure investment, seasonal visitation, or growth in or near documented hazard-prone areas may increase exposure where new people or assets are added. No participant-specific observed increase is established.	Indeterminate: available participant-specific development and mitigation records do not establish whether vulnerability stayed the same.	No decrease is established by the available participant-specific records.
Town of Tropic	Development, infrastructure investment, seasonal visitation, or growth in or near documented hazard-prone areas may increase exposure where new people or assets are added. No participant-specific observed increase is established.	Indeterminate: available participant-specific development and mitigation records do not establish whether vulnerability stayed the same.	No decrease is established by the available participant-specific records.

Capability Assessment

The capability assessment identifies plans, regulations, staff, technical resources, funding mechanisms, outreach methods, and floodplain-management functions available to support mitigation. The assessment informs action feasibility, implementation responsibility, potential resources, integration, and capability-improvement needs. Where a capability could not be confirmed, this annex does not assume that it exists. The local capability inventory describes the planning and administrative framework reported in the annex. Dated ordinance, staffing, and implementation records are not available to independently establish each

entry's current status; the inventory does not demonstrate NFIP enforcement or completion of individual mitigation actions.

Garfield County Capability Assessment

Table 92 describes the mitigation capabilities for Garfield County (unincorporated areas).

Table 92: Garfield County Capability Assessment

Capability	Description
Plans and Regulations	General Plan (1998); Resource Management Plan (2017); Economic Development Plan (2020); Community Wildfire Protection Plan (2022); Land Use Plan, as included in the General Plan; Transportation Master Plan; Moderate Income Housing Plan; Garfield County Code of Ordinances; Building Code and building permit program administered by the Garfield County Building Department; Subdivision Ordinance; Zoning Ordinance; Flood Damage Prevention Ordinance, Garfield County Code Title XV, Chapter 154; Flood Insurance Rate Maps, effective 8/5/1986; and regulations restricting development in mapped special flood hazard areas through floodplain development review.
Administrative and Technical	Chief Building Official; County Planner; Emergency Manager; Floodplain Administrator; Geographic Information System (GIS) Coordinator; Planning Commission; Active Voluntary Organizations Active in Disaster (VOADs); Mitigation Grant Writing; Hazard Data and Information; GIS; Mutual Aid Agreements; Building Official; Public Works Department; Sheriff's Office, Ambulance District; volunteer and municipal fire services.
Financial	Community Development Block Grant (CDBG); Natural Resources Conservation Service (NRCS) Programs; U.S. Army Corps of Engineers (USACE) Programs; Property, Sales, Income, or Special Purpose Taxes; General Obligation or Special Purpose Bonds; Federal-funded Programs
Education and Outreach	County Newsletters and Public Notices; Hazard Awareness Campaigns (such as Firewise, StormReady, Severe Weather Awareness Week, School Programs); Public Meetings/Events; Emergency Management Listserv; Local News; Distributing Hard Copies of Notices (e.g., public libraries, door-to-door outreach)
National Flood Insurance Program	FEMA lists Garfield County as an NFIP-participating community (Community 490065). The effective-map field is recorded as 08/05/86(M); this is not a local ordinance-adoption date. No CRS class is reported in this entry. The status book establishes program status, not local permitting, enforcement, or substantial-improvement/substantial-damage implementation. Participant-specific implementation records and repetitive-loss/severe-

Capability	Description
	repetitive-loss building counts and types are not established by the available evidence; no zero count or finding of compliance is inferred.[198][199]

The following describes opportunities to expand and improve mitigation capabilities for Garfield County (unincorporated areas). These opportunities are organized by capability category:

- **Plans and Regulations:** Garfield County can expand mitigation capability by updating older planning documents and continuing to integrate hazard mitigation, land use, wildfire, floodplain, transportation, housing, and capital improvement priorities into county plans and ordinances.
- **Administrative and Technical:** Garfield County can strengthen implementation capacity by continuing coordination among planning, building, emergency management, public works, geographic information system (GIS), public safety, and partner agencies to support permitting, hazard mapping, grant development, project scoping, and mitigation tracking.
- **Financial:** Garfield County can improve financial capability by identifying mitigation projects in annual budgets and capital planning processes and by pursuing state, federal, and partner funding for flood, wildfire, infrastructure, public facility, and resilience projects.
- **Education and Outreach:** Garfield County can improve outreach by using the county website, public meetings, newsletters, emergency management messaging, schools, local news, and direct notices to share hazard-specific mitigation information with residents, businesses, visitors, and rural communities.
- **National Flood Insurance Program:** Garfield County can strengthen NFIP capability by maintaining current floodplain administration procedures, documenting permit and substantial damage processes, reviewing opportunities to update floodplain mapping and outreach, and evaluating whether future Community Rating System participation would benefit residents.

Town of Antimony Capability Assessment

Table 93 describes the mitigation capabilities for the Town of Antimony.

Table 93: Town of Antimony Capability Assessment

Capability	Description
Plans and Regulations	Antimony Land Use Ordinance; Zoning Ordinance; building permit review through Garfield County.

[198] CRS = Community Rating System
[199] FEMA, OpenFEMA NFIP Community Status Book, Utah records, retrieved October 10, 2026; dataset refresh August 25, 2026. https://www.fema.gov/api/open/v1/NfipCommunityStatusBook. Map dates are FEMA effective-map entries, not evidence of local adoption or implementation.

Capability	Description
Administrative and Technical	Volunteer elected Town Council and Mayor; Town Clerk; Law Enforcement provided by County Sheriff in Panguitch City; Garkane Energy Electrical Service; South Central Communications Service; and coordination with Garfield County, state agencies, and regional partners for emergency management and mitigation support.
Financial	Local budgeting and municipal revenues; eligibility for state and federal grant programs; Community Development Block Grant funding, FEMA HMGP,[200] and partner agency funding for infrastructure, emergency management, and resilience projects.
Education and Outreach	Public meetings; town notices; coordination with Garfield County Emergency Management; local and regional preparedness messaging; and distribution of hazard information through community outreach and public engagement activities.
National Flood Insurance Program	No separate NFIP or CRS entry for Antimony was found in the complete Utah Community Status Book records reviewed. County participation does not establish municipal participation; the absence of an entry does not establish absence of local floodplain regulation. The status book establishes program status, not local permitting, enforcement, or substantial-improvement/substantial-damage implementation. Participant-specific implementation records and repetitive-loss/severe-repetitive-loss building counts and types are not established by the available evidence; no zero count or finding of compliance is inferred.[201]

The following describes opportunities to expand and improve mitigation capabilities for the Town of Antimony. These opportunities are organized by capability category:

- **Plans and Regulations:** Antimony can strengthen local land use and development policies by incorporating hazard mitigation considerations into future planning and ordinance updates.
- **Administrative and Technical:** Antimony can continue coordination with Garfield County, utility providers, and regional partners to support emergency management, grant development, and project implementation.
- **Financial:** Antimony can pursue state, federal, and partner funding sources for infrastructure improvements, emergency preparedness, and hazard mitigation projects.
- **Education and Outreach:** Antimony can expand public preparedness education through meetings, notices, and coordination with county emergency management programs.

[200] HMGP = Hazard Mitigation Grant Program

[201] FEMA, OpenFEMA NFIP Community Status Book, Utah records, retrieved October 10, 2026; dataset refresh August 25, 2026. https://www.fema.gov/api/open/v1/NfipCommunityStatusBook. Map dates are FEMA effective-map entries, not evidence of local adoption or implementation.

- **National Flood Insurance Program:** Antimony can continue coordination with Garfield County regarding floodplain administration and flood risk awareness.

Town of Boulder Capability Assessment

Table 94 describes the mitigation capabilities for the Town of Boulder.

Table 94: Town of Boulder Capability Assessment

Capability	Description
Plans and Regulations	General Plan; Community Wildfire Preparedness Plan (2018); Emergency Operations Plan (2008); Subdivision Ordinance; Zoning Ordinance.
Administrative and Technical	Volunteer Mayor; Volunteer Board Members; Volunteer Emergency Services; Law Enforcement provided by Garfield County.
Financial	Local budgeting and municipal revenues; eligibility for FEMA HMGP; Community Development Block Grant funding, wildfire mitigation funding, and other state and federal assistance programs supporting infrastructure, emergency management, and resilience efforts.
Education and Outreach	Public meetings; community preparedness outreach; wildfire awareness activities; coordination with Garfield County Emergency Management, volunteer responders, and regional partners; and outreach to residents and visitors regarding hazard preparedness and emergency response.
National Flood Insurance Program	No separate NFIP or CRS entry for Boulder was found in the complete Utah Community Status Book records reviewed. County participation does not establish municipal participation; the absence of an entry does not establish absence of local floodplain regulation. The status book establishes program status, not local permitting, enforcement, or substantial-improvement/substantial-damage implementation. Participant-specific implementation records and repetitive-loss/severe-repetitive-loss building counts and types are not established by the available evidence; no zero count or finding of compliance is inferred.[202]

The following describes opportunities to expand and improve mitigation capabilities for the Town of Boulder. These opportunities are organized by capability category:

- **Plans and Regulations:** Boulder can continue integrating hazard mitigation, wildfire resilience, land use planning, and emergency management priorities into local plans and ordinances.
- **Administrative and Technical:** Boulder can build capacity through continued coordination among volunteer officials, emergency services, Garfield County, and regional partners.

[202] FEMA, OpenFEMA NFIP Community Status Book, Utah records, retrieved October 10, 2026; dataset refresh August 25, 2026. https://www.fema.gov/api/open/v1/NfipCommunityStatusBook. Map dates are FEMA effective-map entries, not evidence of local adoption or implementation.

- **Financial:** Boulder can seek grant opportunities for wildfire mitigation, infrastructure protection, emergency preparedness, and transportation resilience projects.
- **Education and Outreach:** Boulder can expand wildfire preparedness, evacuation awareness, and hazard education efforts for residents and visitors.
- **National Flood Insurance Program:** Boulder can maintain coordination with county floodplain management activities and improve local flood risk awareness.

Bryce Canyon City Capability Assessment

Table 95 describes the mitigation capabilities for Bryce Canyon City.

Table 95: Bryce Canyon City Capability Assessment

Capability	Description
Plans and Regulations	General Plan (2018); and local planning mechanisms that support visitor safety, emergency preparedness, land use coordination, and infrastructure resilience.
Administrative and Technical	Volunteer elected Mayor; Town Clerk; utility service provided by Garkane Energy and Rocky Mountain Power; coordination with Garfield County Emergency Management, county public safety partners, utility providers, and regional organizations supporting emergency preparedness and mitigation activities.
Financial	Local municipal revenues; eligibility for state and federal grant programs; potential access to tourism-related infrastructure funding, FEMA HMGP and resilience funding opportunities through state and federal partners.
Education and Outreach	Public meetings; community notifications; coordination with Garfield County Emergency Management; visitor-focused preparedness messaging; and outreach through municipal, county, and regional communication channels.
National Flood Insurance Program	No separate NFIP or CRS entry for Bryce Canyon City was found in the complete Utah Community Status Book records reviewed. County participation does not establish municipal participation; the absence of an entry does not establish absence of local floodplain regulation. The status book establishes program status, not local permitting, enforcement, or substantial-improvement/substantial-damage implementation. Participant-specific implementation records and repetitive-loss/severe-repetitive-loss building counts and types are not established by the available evidence; no zero count or finding of compliance is inferred.[203]

[203] FEMA, OpenFEMA NFIP Community Status Book, Utah records, retrieved October 10, 2026; dataset refresh August 25, 2026. https://www.fema.gov/api/open/v1/NfipCommunityStatusBook. Map dates are FEMA effective-map entries, not evidence of local adoption or implementation.

The following describes opportunities to expand and improve mitigation capabilities for Bryce Canyon City. These opportunities are organized by capability category:

- **Plans and Regulations:** Bryce Canyon City can continue integrating hazard mitigation, wildfire resilience, visitor safety, and emergency management considerations into local planning efforts.
- **Administrative and Technical:** Bryce Canyon City can strengthen coordination among municipal leadership, utility providers, Garfield County, and emergency management partners.
- **Financial:** Bryce Canyon City can pursue funding opportunities for infrastructure protection, visitor safety improvements, wildfire mitigation, emergency communications, and resilience projects.
- **Education and Outreach:** Bryce Canyon City can expand outreach focused on residents, employees, businesses, and visitors regarding wildfire, flooding, severe weather, and evacuation preparedness.
- **National Flood Insurance Program:** Bryce Canyon City can continue coordination with county floodplain management activities and support awareness of local flood hazards.

Town of Cannonville Capability Assessment

Table 96 describes the mitigation capabilities for the Town of Cannonville.

Table 96: Town of Cannonville Capability Assessment

Capability	Description
Plans and Regulations	Town of Cannonville local planning and land use mechanisms; municipal ordinances; development review processes coordinated with Garfield County where applicable; participation in the Five County Association of Governments Natural Hazard Mitigation Plan; and coordination with county and regional partners to support hazard mitigation, emergency preparedness, and community resilience.
Administrative and Technical	Volunteer elected Town Council and Mayor; Town Clerk; law enforcement provided by the Garfield County Sheriff's Office; Garkane Energy electrical service; South Central Communications service; and coordination with Garfield County Emergency Management, utility providers, state agencies, and regional organizations supporting preparedness and mitigation activities.
Financial	Cannonville may support mitigation through local budgeting, municipal revenues, state and federal grant programs, Community Development Block Grant funding, FEMA HMGP, and partnerships with Garfield County, state agencies, and regional organizations. These funding sources may support infrastructure improvements, drainage projects, emergency preparedness initiatives, wildfire mitigation activities, and public facility resilience projects.
Education and Outreach	Cannonville supports mitigation through public meetings, community notices, coordination with Garfield County Emergency Management, regional preparedness initiatives, hazard awareness messaging, and

Capability	Description
	outreach provided through local government communications and community engagement activities. These efforts support public awareness of flood, wildfire, severe weather, and other hazard risks.
National Flood Insurance Program	No separate NFIP or CRS entry for Cannonville was found in the complete Utah Community Status Book records reviewed. County participation does not establish municipal participation; the absence of an entry does not establish absence of local floodplain regulation. The status book establishes program status, not local permitting, enforcement, or substantial-improvement/substantial-damage implementation. Participant-specific implementation records and repetitive-loss/severe-repetitive-loss building counts and types are not established by the available evidence; no zero count or finding of compliance is inferred.[204]

The following describes opportunities to expand and improve mitigation capabilities for the Town of Cannonville. These opportunities are organized by capability category:

- **Plans and Regulations:** Cannonville can strengthen mitigation capability by incorporating hazard mitigation considerations into future planning efforts, land use decisions, and ordinance updates.
- **Administrative and Technical:** Cannonville can enhance implementation capacity through continued coordination with Garfield County, emergency management partners, utility providers, and regional organizations supporting emergency preparedness and mitigation activities.
- **Financial:** Cannonville can pursue additional state, federal, and partner funding opportunities to support infrastructure resilience, emergency preparedness, flood mitigation, and wildfire reduction projects.
- **Education and Outreach:** Cannonville can expand community preparedness efforts through additional hazard education, public outreach, preparedness campaigns, and participation in regional mitigation initiatives.
- **National Flood Insurance Program:** Cannonville can continue coordinating with Garfield County on floodplain management activities and support greater community awareness of flood hazards and mitigation opportunities.

[204] FEMA, OpenFEMA NFIP Community Status Book, Utah records, retrieved October 10, 2026; dataset refresh August 25, 2026. https://www.fema.gov/api/open/v1/NfipCommunityStatusBook. Map dates are FEMA effective-map entries, not evidence of local adoption or implementation.

City of Escalante Capability Assessment

Table 97 describes the mitigation capabilities for the City of Escalante.

Table 97: City of Escalante Capability Assessment

Capability	Description
Plans and Regulations	City of Escalante General Plan; Escalante Municipal Code; Planning and Zoning Regulations; Flood Control Ordinance, Chapter 12; building permit and development review processes; and local land use and development review procedures supporting hazard mitigation and resilience planning.
Administrative and Technical	Governed by elected Mayor and five-member Council; eight-person planning and zoning commission; five-person board of adjustments; law enforcement services provided by Garfield County; Garkane Energy electrical service and Garkane Propane service; and coordination with Garfield County Emergency Management, utility providers, and regional partners supporting mitigation implementation.[205]
Financial	Escalante may support mitigation through municipal budgeting, capital improvement planning, property and sales tax revenues, Community Development Block Grant funding, FEMA mitigation assistance programs, state grant programs, and partnerships with county, regional, state, and federal agencies. These resources may support drainage improvements, infrastructure protection, emergency preparedness, public facility upgrades, and wildfire mitigation projects.
Education and Outreach	Escalante supports mitigation through public meetings, city notifications, community outreach activities, coordination with Garfield County Emergency Management, local preparedness messaging, and engagement with residents, businesses, and visitors regarding natural hazard risks and emergency preparedness.
National Flood Insurance Program	FEMA lists Escalante as an NFIP-participating community (Community 490067). The effective-map field is recorded as 08/28/79(M); this is not a local ordinance-adoption date. No CRS class is reported in this entry. The status book establishes program status, not local permitting, enforcement, or substantial-improvement/substantial-damage implementation. Participant-specific implementation records and repetitive-loss/severe-repetitive-loss building counts and types are not established by the available evidence; no zero count or finding of compliance is inferred.[206]

[205] Garkane Energy Cooperative, Garkane Propane; Garkane Propane service territory includes Garfield County. https://garkaneenergy.com/garkane-propane ; http://garkanepropane.com/. Accessed October 9, 2026.
[206] FEMA, OpenFEMA NFIP Community Status Book, Utah records, retrieved October 10, 2026; dataset refresh August 25, 2026. https://www.fema.gov/api/open/v1/NfipCommunityStatusBook. Map dates are FEMA effective-map entries, not evidence of local adoption or implementation.

The following describes opportunities to expand and improve mitigation capabilities for the City of Escalante. These opportunities are organized by capability category:

- **Plans and Regulations:** Escalante can strengthen mitigation integration by continuing to incorporate hazard mitigation principles into planning, zoning, floodplain management, transportation, and capital improvement decisions.
- **Administrative and Technical:** Escalante can further build technical capability through continued coordination among city officials, planning and zoning representatives, emergency management personnel, utility providers, and regional partners.
- **Financial:** Escalante can improve mitigation funding opportunities by identifying priority projects in capital planning processes and pursuing additional state, federal, and partner grant resources.
- **Education and Outreach:** Escalante can expand public awareness efforts through preparedness campaigns, community outreach, emergency messaging, and education addressing flood, wildfire, severe weather, and other hazards.
- **National Flood Insurance Program:** Escalante can strengthen NFIP capability by maintaining floodplain administration procedures, documenting floodplain permitting processes, promoting flood risk awareness, and evaluating opportunities to improve floodplain management practices.

Town of Hatch Capability Assessment

Table 98 describes the mitigation capabilities for the Town of Hatch.

Table 98: Town of Hatch Capability Assessment

Capability	Description
Plans and Regulations	Town of Hatch General Plan; municipal ordinances; building permit review processes coordinated with Garfield County where applicable; land use and zoning regulations; and other local planning mechanisms that guide growth and community development.
Administrative and Technical	Volunteer elected Town Council and Mayor; Town Clerk; Law Enforcement provided by County Sheriff in Panguitch City; Garkane Energy Electrical Service; Blackburn Propane, Garkane Propane, or AmeriGas Gas service; and coordination with Garfield County Emergency Management, utility providers, state agencies, and regional organizations supporting preparedness and mitigation activities.
Financial	Hatch may support mitigation through municipal budgeting, local revenues, state and federal grant opportunities, FEMA HMGP, Community Development Block Grant funding, and partnerships with county, state, and regional organizations. These funding mechanisms may support infrastructure improvements, emergency preparedness activities, flood mitigation initiatives, and wildfire risk reduction projects.

Capability	Description
Education and Outreach	Hatch supports mitigation through public meetings, community announcements, coordination with Garfield County Emergency Management, preparedness messaging, and local outreach activities designed to improve community awareness of hazards and emergency preparedness actions.
National Flood Insurance Program	FEMA lists Hatch as an NFIP-participating community (Community 490068). The effective-map field is recorded as 07/24/79(M); this is not a local ordinance-adoption date. No CRS class is reported in this entry. The status book establishes program status, not local permitting, enforcement, or substantial-improvement/substantial-damage implementation. Participant-specific implementation records and repetitive-loss/severe-repetitive-loss building counts and types are not established by the available evidence; no zero count or finding of compliance is inferred.[207]

The following describes opportunities to expand and improve mitigation capabilities for the Town of Hatch. These opportunities are organized by capability category:

- **Plans and Regulations:** Hatch can strengthen mitigation capability by integrating hazard mitigation considerations into future planning efforts, land use decisions, infrastructure planning, and ordinance updates.
- **Administrative and Technical:** Hatch can improve implementation capacity through continued coordination with county agencies, emergency management partners, utility providers, and regional organizations that support mitigation and emergency preparedness.
- **Financial:** Hatch can strengthen financial capability by identifying mitigation priorities in annual budgeting processes and pursuing additional grant funding for infrastructure resilience and hazard mitigation projects.
- **Education and Outreach:** Hatch can expand outreach efforts by increasing hazard awareness messaging, preparedness education, and community engagement activities addressing local risks and mitigation opportunities.
- **National Flood Insurance Program:** Hatch can strengthen floodplain management capability by evaluating opportunities to formalize floodplain administration procedures, improve flood risk awareness, and coordinate with county and state floodplain management partners.

[207] FEMA, OpenFEMA NFIP Community Status Book, Utah records, retrieved October 10, 2026; dataset refresh August 25, 2026. https://www.fema.gov/api/open/v1/NfipCommunityStatusBook. Map dates are FEMA effective-map entries, not evidence of local adoption or implementation.

Town of Henrieville Capability Assessment

Table 99 describes the mitigation capabilities for the Town of Henrieville.

Table 99: Town of Henrieville Capability Assessment

Capability	Description
Plans and Regulations	Town of Henrieville local planning and land use mechanisms; municipal ordinances; development review processes coordinated with Garfield County where applicable; and coordination with county and regional partners to support hazard mitigation, emergency preparedness, and community resilience.
Administrative and Technical	Volunteer elected Town Council and Mayor; Town Clerk; Law Enforcement provided by County Sheriff in Panguitch City; Garkane Energy Electrical Service; and coordination with Garfield County Emergency Management, utility providers, state agencies, and regional organizations supporting preparedness and mitigation activities.
Financial	Henrieville may support mitigation through local budgeting, municipal revenues, FEMA HMGP, Community Development Block Grant funding, state grant programs, and partnerships with Garfield County, state agencies, and regional organizations. These funding sources may support drainage improvements, infrastructure protection, emergency preparedness, flood mitigation, roadway improvements, and wildfire risk reduction projects.
Education and Outreach	Henrieville supports mitigation through public meetings, community notices, town communications, coordination with Garfield County Emergency Management, preparedness information campaigns, and participation in regional hazard mitigation and emergency preparedness efforts.
National Flood Insurance Program	FEMA lists Henrieville as an NFIP-participating community (Community 490069). The effective-map field is recorded as 09/28/79(M); this is not a local ordinance-adoption date. No CRS class is reported in this entry. The status book establishes program status, not local permitting, enforcement, or substantial-improvement/substantial-damage implementation. Participant-specific implementation records and repetitive-loss/severe-repetitive-loss building counts and types are not established by the available evidence; no zero count or finding of compliance is inferred.[208]

The following describes opportunities to expand and improve mitigation capabilities for the Town of Henrieville. These opportunities are organized by capability category:

[208] FEMA, OpenFEMA NFIP Community Status Book, Utah records, retrieved October 10, 2026; dataset refresh August 25, 2026. https://www.fema.gov/api/open/v1/NfipCommunityStatusBook. Map dates are FEMA effective-map entries, not evidence of local adoption or implementation.

- **Plans and Regulations:** Henrieville can strengthen mitigation capability by incorporating hazard mitigation considerations into future planning efforts, development review processes, land use decisions, and ordinance updates.
- **Administrative and Technical:** Henrieville can expand implementation capacity through continued coordination with Garfield County, emergency management partners, utility providers, and regional organizations supporting mitigation activities.
- **Financial:** Henrieville can pursue additional state, federal, and partner funding opportunities to support infrastructure resilience, emergency preparedness, flood mitigation, and wildfire reduction projects.
- **Education and Outreach:** Henrieville can expand public awareness efforts through preparedness education, hazard awareness messaging, seasonal outreach campaigns, and participation in countywide preparedness initiatives.
- **National Flood Insurance Program:** Henrieville can continue supporting floodplain management efforts through coordination with Garfield County and by increasing awareness of flood hazards and floodplain development requirements.

Panguitch City Capability Assessment

Table 100 describes the mitigation capabilities of Panguitch City.

Table 100: Panguitch City Capability Assessment

Capability	Description
Plans and Regulations	City General Plan; Capital Facilities Plan (2020); Disaster Response Plan; adopted Utah State Construction Code;Panguitch Municipal Code; Flood Damage Prevention Ordinance; development review and permitting procedures; and local planning mechanisms that support hazard mitigation, infrastructure resilience, and emergency preparedness.[209]
Administrative and Technical	Elected Mayor and City Council; City Streets Department; Building Inspector; Rocky Mountain Power electric service; culinary water system; law enforcement provided by Garfield County; Panguitch City Fire Department; city administrative and public works functions; and coordination with Garfield County Emergency Management, utility providers, and regional partners supporting mitigation implementation.
Financial	Panguitch may support mitigation through municipal budgeting, capital improvement planning, property and sales tax revenues, Community Development Block Grant funding, FEMA HMGP, state grants, utility revenues, and partnerships with county, regional, state, and federal

[209] Utah Code, Title 15A, State Construction and Fire Codes Act, Chapters 1-4. https://le.utah.gov/xcode/Title15A/15A.html?v=C15A_1800010118000101. This reference identifies the state-adopted construction code without assuming a specific local code edition.

Capability	Description
	agencies. These resources may support drainage projects, infrastructure protection, emergency communications improvements, flood mitigation, wildfire mitigation, and critical facility resilience projects.
Education and Outreach	Panguitch supports mitigation through public meetings, city notices, community outreach activities, local preparedness campaigns, coordination with Garfield County Emergency Management, school outreach efforts, and dissemination of hazard preparedness information to residents, businesses, and visitors.
National Flood Insurance Program	FEMA lists Panguitch as an NFIP-participating community (Community 490070). The effective-map field is recorded as 08/28/79(M); this is not a local ordinance-adoption date. No CRS class is reported in this entry. The status book establishes program status, not local permitting, enforcement, or substantial-improvement/substantial-damage implementation. Participant-specific implementation records and repetitive-loss/severe-repetitive-loss building counts and types are not established by the available evidence; no zero count or finding of compliance is inferred.[210]

The following describes opportunities to expand and improve mitigation capabilities for Panguitch City. These opportunities are organized by capability category:

- **Plans and Regulations:** Panguitch can expand mitigation integration by incorporating hazard mitigation priorities into future land use planning, transportation projects, capital facilities planning, floodplain management, and development review processes.
- **Administrative and Technical:** Panguitch can strengthen implementation capacity through continued coordination among city departments, emergency services, Garfield County, utility providers, and regional partners involved in emergency management and mitigation activities.
- **Financial:** Panguitch can improve financial capability by identifying mitigation priorities within capital improvement programs and pursuing additional federal, state, and partner funding opportunities.
- **Education and Outreach:** Panguitch can enhance community preparedness through continued public outreach, emergency preparedness education, hazard awareness campaigns, and communication with vulnerable populations.
- **National Flood Insurance Program:** Panguitch can strengthen NFIP capability by maintaining floodplain management procedures, documenting floodplain permitting activities, increasing public awareness of flood risk, and evaluating opportunities to further enhance floodplain management practices.

[210] FEMA, OpenFEMA NFIP Community Status Book, Utah records, retrieved October 10, 2026; dataset refresh August 25, 2026. https://www.fema.gov/api/open/v1/NfipCommunityStatusBook. Map dates are FEMA effective-map entries, not evidence of local adoption or implementation.

Town of Tropic Capability Assessment

Table 101 describes the mitigation capabilities for the Town of Tropic.

Table 101: Town of Tropic Capability Assessment

Capability	Description
Plans and Regulations	General Plan (2020); Zoning Ordinance; Fire Protection Ordinance; Flood Control Ordinance; and local planning mechanisms that support hazard mitigation, land use coordination, infrastructure resilience, and emergency preparedness.
Administrative and Technical	Volunteer elected Town Council and Mayor; Town Clerk; Law Enforcement provided by County Sheriff in Panguitch City; Garkane Energy Electrical Service; Blackburn Propane, Garkane Propane, or AmeriGas Gas service; Hughes Waste Haulers; South Central Communications; and coordination with Garfield County Emergency Management, utility providers, service providers, state agencies, and regional organizations supporting mitigation and emergency preparedness.
Financial	Tropic may support mitigation through local budgeting, municipal revenues, Community Development Block Grant funding, FEMA HMGP, state grant programs, tourism-related funding opportunities, and partnerships with Garfield County, state agencies, and regional organizations. These funding sources may support infrastructure improvements, drainage projects, emergency preparedness activities, flood mitigation, and wildfire risk reduction projects.
Education and Outreach	Tropic supports mitigation through public meetings, community notices, town communications, visitor information materials, coordination with Garfield County Emergency Management, preparedness campaigns, and community outreach activities focused on natural hazard awareness and emergency readiness.
National Flood Insurance Program	FEMA lists Tropic as an NFIP-participating community (Community 490071). The effective-map field is recorded as 12/04/79(M); this is not a local ordinance-adoption date. No CRS class is reported in this entry. The status book establishes program status, not local permitting, enforcement, or substantial-improvement/substantial-damage implementation. Participant-specific implementation records and repetitive-loss/severe-repetitive-loss building counts and types are not established by the available evidence; no zero count or finding of compliance is inferred.[211]

[211] FEMA, OpenFEMA NFIP Community Status Book, Utah records, retrieved October 10, 2026; dataset refresh August 25, 2026. https://www.fema.gov/api/open/v1/NfipCommunityStatusBook. Map dates are FEMA effective-map entries, not evidence of local adoption or implementation.

The following describes opportunities to expand and improve mitigation capabilities for the Town of Tropic. These opportunities are organized by capability category:

- **Plans and Regulations:** Tropic can strengthen mitigation capability by continuing to incorporate hazard mitigation considerations into land use planning, infrastructure planning, zoning decisions, and future ordinance updates.
- **Administrative and Technical:** Tropic can expand implementation capacity through continued coordination with county agencies, emergency management partners, utility providers, tourism stakeholders, and regional organizations.
- **Financial:** Tropic can improve financial capability by pursuing additional federal, state, and partner funding opportunities that support infrastructure resilience, emergency preparedness, flood mitigation, and wildfire reduction efforts.
- **Education and Outreach:** Tropic can expand outreach efforts by increasing preparedness messaging for residents, businesses, and visitors and by supporting community participation in hazard mitigation and emergency preparedness activities.
- **National Flood Insurance Program:** Tropic can strengthen NFIP capability by maintaining coordination with Garfield County floodplain management activities, increasing community awareness of flood risk, and supporting compliance with floodplain development requirements.

Status of Previous Mitigation Actions

Garfield County and its communities have participated in previous iterations of the multi-jurisdictional hazard mitigation plan and identified strategies to mitigate natural hazard risks. Describing the status of previous mitigation actions helps demonstrate the ongoing progress made to reduce risk and the communities' commitment to mitigation. At the same time, it serves as an opportunity to evaluate whether an incomplete action is still worth pursuing. The following table preserves prior actions and distinguishes current strategy concepts from implementation status. Dated project records or participant findings are not available to establish completion, continued implementation, or removal.

Standard status categories are Complete, In Progress – Still Relevant, Deferred, No Longer Relevant, and Status Unknown / Unable to Verify. The identifiers use a county prefix, prior-plan year, PA for previous action, and a two-digit sequence; the original identifiers are retained for traceability.

Table 102 describes progress made on the mitigation actions identified for communities in Garfield County in the 2022–2027 hazard mitigation plan.

Table 102: Status of 2022–2027 Mitigation Actions for Garfield County

Action Identifier	Action	Status and Explanation
GC-2022-PA-01 (formerly 1)	Extend and harden countywide radio communications, including to Ticaboo.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
GC-2022-PA-02 (formerly 2)	Support local development of new water resources.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
GC-2022-PA-03 (formerly 3)	Maintain existing watershed protection zones.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
GC-2022-PA-04 (formerly 4)	Coordinate new watershed protection zones.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
GC-2022-PA-05 (formerly 5)	Address septic density in unincorporated development.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
GC-2022-PA-06 (formerly 6)	Coordinate radon testing in K–12 public schools.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
GC-2022-PA-07 (formerly 7)	Expand culverts on Burr Trail and Hole-in-the-Rock Road.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
GC-2022-PA-08 (formerly 8)	Complete a Ticaboo stormwater drainage study.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.

Action Identifier	Action	Status and Explanation
GC-2022-PA-09 (formerly 9)	Require geotechnical reports for subdivisions.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
GC-2022-PA-10 (formerly 10)	Map collapsible and expansive soils and require testing.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
GC-2022-PA-11 (formerly 11)	Distribute UGS[212] landslide information.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
GC-2022-PA-12 (formerly 12)	Update zoning or landslide provisions.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
GC-2022-PA-13 (formerly 13)	Require geotechnical reports for landslide risk.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
GC-2022-PA-14 (formerly 14)	Promote WUI defensible-space awareness.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
GC-2022-PA-15 (formerly 15)	Establish strategic fuel breaks.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
GC-2022-PA-16 (formerly 16)	Encourage landowner defensible-space work.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued

[212] UGS = Utah Geological Survey

Action Identifier	Action	Status and Explanation
		implementation, or participant approval of removal is not inferred.
GC-2022-PA-17 (formerly 17)	Coordinate private-land work with federal fuels reduction.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
GC-2022-PA-18 (formerly 18)	Reduce ignition and spread risk on private lands.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
GC-2022-PA-19 (formerly 19)	Enhance wildfire training, equipment, and resources.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
GC-2022-PA-20 (formerly 20)	Improve the WUI program.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
GC-2022-PA-21 (formerly 21)	Support forest health through appropriate vegetation management.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
GC-2022-PA-22 (formerly 22)	Coordinate with BLM[213] pinyon-juniper treatments.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
GC-2022-PA-23 (formerly 23)	Treat vegetation on private and county-owned lands.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.

[213] BLM = Bureau of Land Management

Action Identifier	Action	Status and Explanation
GC-2022-PA-24 (formerly 24)	Use land-use controls to avoid flood-prone development.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
GC-2022-PA-25 (formerly 25)	Require stormwater drainage review for subdivisions.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
GC-2022-PA-26 (formerly 26)	Maintain waterways where legally and environmentally appropriate.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
GC-2022-PA-27 (formerly 27)	Develop Paria River flood mitigation improvements.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
GC-2022-PA-28 (formerly 28)	Evaluate CRS participation.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
GC-2022-PA-29 (formerly 29)	Enforce adopted seismic provisions.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
GC-2022-PA-30 (formerly 30)	Use available earthquake mapping in development review.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
GC-2022-PA-31 (formerly 31)	Coordinate updated earthquake-hazard mapping with UGS.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.

Mitigation Goals

The communities of Garfield County approve the identification of the mitigation goals for the Five County AOG Region as outlined in the base plan, including the following goals and objectives:

Goal 1: Protect Life and Property

Goal Statement: Reduce long-term risk to people and public, private, residential, agricultural, and commercial property through appropriate structural and nonstructural mitigation measures.

Objective: Reduce the potential for injury, loss of life, property damage, and disruption by directing mitigation resources toward documented hazards and vulnerable people, structures, and locations.

Goal 2: Protect Critical Facilities, Infrastructure, and Community Lifelines

Goal Statement: Reduce risk to critical facilities, infrastructure systems, and community lifelines and improve their ability to continue or rapidly restore essential functions following natural hazard events.

Objective: Promote mitigation, redundancy, protective design, maintenance, and other risk-reduction measures that limit damage and service interruptions affecting essential community functions.

Goal 3: Strengthen Public Education and Risk Communication

Goal Statement: Improve residents' and visitors' understanding of natural hazards, protective measures, insurance and other risk-transfer options where applicable, and actions they can take to reduce risk.

Objective: Provide accessible, hazard-specific information and outreach that supports informed risk-reduction decisions and addresses the needs of people and locations that may experience disproportionate hazard impacts.

Goal 4: Strengthen Partnerships and Coordination

Goal Statement: Coordinate mitigation planning and implementation among participating jurisdictions; local, state, Tribal, and federal agencies; nonprofit and community organizations; businesses; infrastructure owners and operators; academia; and other relevant partners.

Objective: Maintain partnerships that improve information sharing, align authorities and resources, support cross-jurisdictional projects, and address hazards and landscapes that cross jurisdictional boundaries, including coordination with federal land-management partners where applicable.

Goal 5: Strengthen the Resilience of Emergency Services

Goal Statement: Reduce pre-disaster risk to emergency services, personnel, facilities, equipment, communications, access routes, and supporting systems needed to protect the public during and after natural hazard events.

Objective: Improve the continuity, redundancy, reliability, and hazard resistance of emergency-service capabilities through sustained mitigation actions undertaken before disasters occur.

Goal 6: Protect and Use Natural Systems

Goal Statement: Protect, restore, and manage natural systems and landscapes where those measures can reduce natural hazard risk and provide compatible environmental and community benefits.

Objective: Advance feasible nature-based and watershed-, forest-, rangeland-, and landscape-scale mitigation measures that reduce long-term risk to communities, infrastructure, property, and economic resources while maintaining or improving natural functions.

2027–2032 Mitigation Action Plan for Garfield County

Participating jurisdictions within Garfield County reviewed the regional mitigation action catalog and selected the actions most appropriate to their identified risks, vulnerabilities, capabilities, and development trends. Table 103 below identifies the actions selected by each jurisdiction. The selected actions address the hazards prioritized in the county and community risk assessments and support achievement of the regional mitigation goals. Each participant has at least one action for every hazard carried forward in Table 76. Section 6.2 of the base plan (the countywide and regional sections preceding the jurisdictional annexes) is incorporated by reference and provides the full action descriptions, hazards and vulnerabilities addressed, goals, responsible positions or agencies, partners, potential funding, costs, timeframes, priorities, and the regional prioritization based on STAPLEE (social, technical, administrative, political, legal, economic, and environmental) criteria and planning-level cost-benefit review.

Table 103: 2027–2032 Mitigation Action Selection for Garfield County Participants

Action Identifier	Action Description	Jurisdictions
FCA-DF-01	Update dam-failure warning, evacuation, and public-information procedures for inundation areas.	Bryce Canyon City; City of Escalante; Panguitch City; Garfield County; Town of Antimony; Town of Boulder; Town of Cannonville; Town of Hatch; Town of Henrieville; Town of Tropic

Action Identifier	Action Description	Jurisdictions
FCA-DR-01	Prepare or update a drought-response and water-shortage plan with staged triggers and conservation measures.	Bryce Canyon City; City of Escalante; Panguitch City; Garfield County; Town of Antimony; Town of Boulder; Town of Cannonville; Town of Hatch; Town of Henrieville; Town of Tropic
FCA-DR-02	Develop or diversify water sources, storage, treatment, conveyance, and emergency interconnections.	City of Escalante; Garfield County
FCA-DR-03	Reduce water demand through leak detection, efficient fixtures, irrigation upgrades, turf replacement, and waterwise landscaping.	City of Escalante; Town of Boulder
FCA-DR-06	Establish, maintain, or expand watershed protection zones and coordinate land-use and septic-density controls to protect source-water quality from hazard-related impacts.	Garfield County
FCA-DW-01	Assess and retrofit vulnerable buildings, roofs, signs, rooftop equipment, communications, and utilities for wind loads.	Bryce Canyon City; City of Escalante; Panguitch City; Garfield County; Town of Antimony; Town of Boulder; Town of Cannonville; Town of Hatch; Town of Henrieville; Town of Tropic
FCA-DW-02	Improve wind warning, public guidance, and debris or vegetation management around infrastructure and routes.	Town of Boulder
FCA-EH-02	Develop a heat-response protocol using forecast triggers, facility hours, transportation options, and targeted notifications.	Bryce Canyon City; City of Escalante; Panguitch City; Garfield County; Town of Antimony; Town of Boulder; Town of Cannonville; Town of Hatch; Town of Henrieville; Town of Tropic
FCA-EH-03	Develop and publish a current list of public cooling locations and operating procedures for activation during severe heat events.	Town of Boulder
FCA-EQ-01	Inventory and evaluate unreinforced masonry, older public buildings, schools, and critical facilities for retrofit.	Bryce Canyon City; City of Escalante; Panguitch City; Garfield County; Town of Antimony; Town of Boulder; Town of Cannonville; Town

Action Identifier	Action Description	Jurisdictions
		of Hatch; Town of Henrieville; Town of Tropic
FCA-EQ-02	Apply seismic codes, flexible utility connections, and equipment anchorage during construction and replacement.	Garfield County
FCA-EQ-03	Provide recurring earthquake-risk and nonstructural-mitigation outreach.	Town of Boulder
FCA-EQ-04	Participate annually in the Great Utah ShakeOut or a comparable earthquake exercise and engage local departments, schools, businesses, and residents.	Town of Boulder
FCA-FL-01	Prepare or update stormwater and drainage master plans and inventory culverts, bridges, washes, and detention facilities.	Bryce Canyon City; City of Escalante; Panguitch City; Garfield County; Town of Antimony; Town of Boulder; Town of Cannonville; Town of Hatch; Town of Henrieville; Town of Tropic
FCA-FL-02	Construct prioritized drainage, culvert, bridge, detention, channel, erosion-control, and bank-stabilization improvements.	Garfield County
FCA-FL-03	Inspect and maintain drainage channels, culverts, detention facilities, and bridge openings.	Garfield County; Town of Boulder
FCA-FL-04	Strengthen floodplain, erosion-hazard, riparian-setback, and stormwater standards for development.	Garfield County
FCA-FL-06	Assess detention basins and river or wash crossings at identified priority locations; repair, expand, or replace deficient infrastructure based on findings.	Town of Boulder
FCA-FL-07	Participate in FEMA Risk MAP,[214] local flood-hazard mapping, and National Flood Insurance Program activities; provide residents and property owners with current flood-risk and NFIP information.	Garfield County
FCA-FL-08	Install, improve, or replace low-water crossings, flash-flood warning signs, and roadway drainage controls at documented flood-prone routes.	Garfield County

[214] Risk MAP = Risk Mapping, Assessment, and Planning

Action Identifier	Action Description	Jurisdictions
FCA-HA-01	Evaluate hail exposure and use impact-resistant roofing, glazing, and equipment protection during replacement or construction.	Bryce Canyon City; City of Escalante; Panguitch City; Garfield County; Town of Antimony; Town of Boulder; Town of Cannonville; Town of Hatch; Town of Henrieville; Town of Tropic
FCA-LS-01	Map, monitor, and evaluate landslide, rockfall, and debris-flow areas affecting development and infrastructure.	Bryce Canyon City; City of Escalante; Panguitch City; Garfield County; Town of Antimony; Town of Boulder; Town of Cannonville; Town of Hatch; Town of Henrieville; Town of Tropic
FCA-LS-02	Require geotechnical investigation, slope analysis, setbacks, and engineered mitigation near unstable slopes.	Garfield County
FCA-LS-04	Prepare and distribute landslide and rockfall risk information for residents, developers, real-estate professionals, and new property owners in mapped hazard areas.	Garfield County
FCA-MH-01	Update emergency operations, continuity, evacuation, warning, and interoperable communications using current risk information.	Town of Boulder
FCA-MH-04	Establish agreements with churches, schools, community centers, and other suitable facilities for evacuation, sheltering, cooling, or warming use during hazard events.	Town of Boulder
FCA-PS-01	Require subsurface geotechnical investigation and foundation recommendations where problem soils may affect structures.	Bryce Canyon City; City of Escalante; Panguitch City; Garfield County; Town of Antimony; Town of Boulder; Town of Cannonville; Town of Hatch; Town of Henrieville; Town of Tropic
FCA-PS-02	Update problem-soil mapping and inventory locations where soil conditions have damaged assets.	Garfield County
FCA-PS-04	Adopt or update a geologic-hazards ordinance establishing mapping, investigation, disclosure, review, and mitigation requirements for development in identified hazard areas.	Garfield County

Action Identifier	Action Description	Jurisdictions
FCA-RN-01	Provide recurring radon-risk, testing, and mitigation information through public and partner channels.	Bryce Canyon City; City of Escalante; Panguitch City; Garfield County; Town of Antimony; Town of Boulder; Town of Cannonville; Town of Hatch; Town of Henrieville; Town of Tropic
FCA-RN-02	Test public facilities for radon and mitigate where results exceed applicable action levels.	Garfield County
FCA-TL-01	Install lightning and surge protection, grounding, backup power, and communications safeguards at critical facilities.	Bryce Canyon City; City of Escalante; Panguitch City; Garfield County; Town of Antimony; Town of Boulder; Town of Cannonville; Town of Hatch; Town of Henrieville; Town of Tropic
FCA-TO-01	Maintain tornado and severe-thunderstorm alerts, shelter guidance, and protective-action messaging.	Bryce Canyon City; City of Escalante; Panguitch City; Garfield County; Town of Antimony; Town of Boulder; Town of Cannonville; Town of Hatch; Town of Henrieville; Town of Tropic
FCA-WI-01	Adopt or update Wildland-Urban Interface standards for defensible space, access, water supply, and ignition-resistant construction.	Bryce Canyon City; City of Escalante; Panguitch City; Garfield County; Town of Antimony; Town of Boulder; Town of Cannonville; Town of Hatch; Town of Henrieville; Town of Tropic
FCA-WI-02	Inventory and reduce hazardous fuels around critical facilities, utilities, roads, and community boundaries.	Garfield County
FCA-WI-03	Update wildfire protection, evacuation, post-fire revegetation, and burn-scar stabilization priorities.	Town of Boulder
FCA-WI-04	Develop and distribute a locally tailored wildfire mitigation toolkit for unincorporated communities and neighborhoods, including guidance for local committees, defensible space, and fuels projects.	Garfield County
FCA-WI-05	Offer voluntary parcel- or home-level wildfire risk assessments and site visits to identify defensible-	Garfield County; Town of Boulder

Action Identifier	Action Description	Jurisdictions
	space, access, vegetation, and structure-hardening opportunities.	
FCA-WI-06	Coordinate recurring community cleanup, mechanical thinning, vegetation maintenance, and irrigation-ditch fuel reduction in wildland-urban interface areas.	Town of Boulder
FCA-WS-01	Prioritize snow and ice control routes serving critical facilities, schools, and isolated communities.	Bryce Canyon City; City of Escalante; Panguitch City; Garfield County; Town of Antimony; Town of Boulder; Town of Cannonville; Town of Hatch; Town of Henrieville; Town of Tropic

Action Selection and Analysis

Participants considered regulatory, structural and infrastructure, natural-systems, education and awareness, and capability-building alternatives. Selections were screened against participant-specific risk and vulnerability, existing and future development, available capability, technical and administrative feasibility, cost and expected benefit, environmental effects, public support, funding potential, and implementation timeframe. High-priority actions will be pursued first when feasible; other retained actions may advance as funding, partnerships, technical information, or implementation opportunities become available.

Plan Integration

Plan integration is the process of incorporating information from the hazard mitigation plan into other planning mechanisms or the governance structures that manage long-term community development and decision-making, including budgets, comprehensive plans, economic development strategies, and other long-range planning documents. Plan integration helps promote mitigation project implementation by incorporating data and actions across programs and day-to-day operations.

Integration of Prior Plan

The plan participants reviewed integration of the prior plan as shown in Table 104.

Table 104: Garfield County Integration of the 2022–2027 Plan

Plan Participant	Description
Garfield County	Garfield County used the 2022–2027 plan as a reference for local planning, development review, infrastructure and utility decisions, emergency management coordination, public outreach, and grant or project development, as applicable to the capabilities identified in this annex. During annual monitoring, the participant will document the specific mechanism, decision, or project through which mitigation information was incorporated and retain supporting records for the next update.
Town of Antimony	Town of Antimony used the 2022–2027 plan as a reference for local planning, development review, infrastructure and utility decisions, emergency management coordination, public outreach, and grant or project development, as applicable to the capabilities identified in this annex. During annual monitoring, the participant will document the specific mechanism, decision, or project through which mitigation information was incorporated and retain supporting records for the next update.
Town of Boulder	Town of Boulder used the 2022–2027 plan as a reference for local planning, development review, infrastructure and utility decisions, emergency management coordination, public outreach, and grant or project development, as applicable to the capabilities identified in this annex. During annual monitoring, the participant will document the specific mechanism, decision, or project through which mitigation information was incorporated and retain supporting records for the next update.
Bryce Canyon City	Bryce Canyon City used the 2022–2027 plan as a reference for local planning, development review, infrastructure and utility decisions, emergency management coordination, public outreach, and grant or project development, as applicable to the capabilities identified in this annex. During annual monitoring, the participant will document the specific mechanism, decision, or project through which mitigation information was incorporated and retain supporting records for the next update.
Town of Cannonville	Town of Cannonville used the 2022–2027 plan as a reference for local planning, development review, infrastructure and utility decisions, emergency management coordination, public outreach, and grant or project development, as applicable to the capabilities identified in this annex. During annual monitoring, the participant will document the specific mechanism, decision, or project through which mitigation information was incorporated and retain supporting records for the next update.
City of Escalante	City of Escalante used the 2022–2027 plan as a reference for local planning, development review, infrastructure and utility decisions, emergency

Plan Participant	Description
	management coordination, public outreach, and grant or project development, as applicable to the capabilities identified in this annex. During annual monitoring, the participant will document the specific mechanism, decision, or project through which mitigation information was incorporated and retain supporting records for the next update.
Town of Hatch	Town of Hatch used the 2022–2027 plan as a reference for local planning, development review, infrastructure and utility decisions, emergency management coordination, public outreach, and grant or project development, as applicable to the capabilities identified in this annex. During annual monitoring, the participant will document the specific mechanism, decision, or project through which mitigation information was incorporated and retain supporting records for the next update.
Town of Henrieville	Town of Henrieville used the 2022–2027 plan as a reference for local planning, development review, infrastructure and utility decisions, emergency management coordination, public outreach, and grant or project development, as applicable to the capabilities identified in this annex. During annual monitoring, the participant will document the specific mechanism, decision, or project through which mitigation information was incorporated and retain supporting records for the next update.
Panguitch City	Panguitch City used the 2022–2027 plan as a reference for local planning, development review, infrastructure and utility decisions, emergency management coordination, public outreach, and grant or project development, as applicable to the capabilities identified in this annex. During annual monitoring, the participant will document the specific mechanism, decision, or project through which mitigation information was incorporated and retain supporting records for the next update.
Town of Tropic	Town of Tropic used the 2022–2027 plan as a reference for local planning, development review, infrastructure and utility decisions, emergency management coordination, public outreach, and grant or project development, as applicable to the capabilities identified in this annex. During annual monitoring, the participant will document the specific mechanism, decision, or project through which mitigation information was incorporated and retain supporting records for the next update.

Integration of Current Plan

The plan participants identified opportunities to integrate the 2027–2032 plan into other planning mechanisms, as documented in Table 105.

Table 105: Garfield County Integration of the 2027–2032 Plan

Plan Participant	Description
Garfield County	During annual plan monitoring, Garfield County will review selected actions with the applicable administrative, planning, public works, utility, building, floodplain, emergency management, finance, or elected functions identified in the capability assessment. When general or land-use plans, ordinances, development reviews, budgets, capital improvement or infrastructure planning programs, wildfire plans, floodplain procedures, emergency management plans and materials, or outreach products are prepared or amended, the responsible function will evaluate relevant hazard information and mitigation actions and record the mechanism reviewed, decision made, responsible function, and implementation status.
Town of Antimony	During annual plan monitoring, Town of Antimony will review selected actions with the applicable administrative, planning, public works, utility, building, floodplain, emergency management, finance, or elected functions identified in the capability assessment. When general or land-use plans, ordinances, development reviews, budgets, capital improvement or infrastructure planning programs, wildfire plans, floodplain procedures, emergency management plans and materials, or outreach products are prepared or amended, the responsible function will evaluate relevant hazard information and mitigation actions and record the mechanism reviewed, decision made, responsible function, and implementation status.
Town of Boulder	During annual plan monitoring, Town of Boulder will review selected actions with the applicable administrative, planning, public works, utility, building, floodplain, emergency management, finance, or elected functions identified in the capability assessment. When general or land-use plans, ordinances, development reviews, budgets, capital improvement or infrastructure planning programs, wildfire plans, floodplain procedures, emergency management plans and materials, or outreach products are prepared or amended, the responsible function will evaluate relevant hazard information and mitigation actions and record the mechanism reviewed, decision made, responsible function, and implementation status.
Bryce Canyon City	During annual plan monitoring, Bryce Canyon City will review selected actions with the applicable administrative, planning, public works, utility, building, floodplain, emergency management, finance, or elected functions identified in the capability assessment. When general or land-use plans, ordinances, development reviews, budgets, capital improvement or infrastructure planning programs, wildfire plans, floodplain procedures, emergency management plans and materials, or outreach products are prepared or amended, the responsible

Plan Participant	Description
	function will evaluate relevant hazard information and mitigation actions and record the mechanism reviewed, decision made, responsible function, and implementation status.
Town of Cannonville	During annual plan monitoring, Town of Cannonville will review selected actions with the applicable administrative, planning, public works, utility, building, floodplain, emergency management, finance, or elected functions identified in the capability assessment. When general or land-use plans, ordinances, development reviews, budgets, capital improvement or infrastructure planning programs, wildfire plans, floodplain procedures, emergency management plans and materials, or outreach products are prepared or amended, the responsible function will evaluate relevant hazard information and mitigation actions and record the mechanism reviewed, decision made, responsible function, and implementation status.
City of Escalante	During annual plan monitoring, City of Escalante will review selected actions with the applicable administrative, planning, public works, utility, building, floodplain, emergency management, finance, or elected functions identified in the capability assessment. When general or land-use plans, ordinances, development reviews, budgets, capital improvement or infrastructure planning programs, wildfire plans, floodplain procedures, emergency management plans and materials, or outreach products are prepared or amended, the responsible function will evaluate relevant hazard information and mitigation actions and record the mechanism reviewed, decision made, responsible function, and implementation status.
Town of Hatch	During annual plan monitoring, Town of Hatch will review selected actions with the applicable administrative, planning, public works, utility, building, floodplain, emergency management, finance, or elected functions identified in the capability assessment. When general or land-use plans, ordinances, development reviews, budgets, capital improvement or infrastructure planning programs, wildfire plans, floodplain procedures, emergency management plans and materials, or outreach products are prepared or amended, the responsible function will evaluate relevant hazard information and mitigation actions and record the mechanism reviewed, decision made, responsible function, and implementation status.
Town of Henrieville	During annual plan monitoring, Town of Henrieville will review selected actions with the applicable administrative, planning, public works, utility, building, floodplain, emergency management, finance, or elected functions identified in the capability assessment. When general or land-use plans, ordinances, development reviews, budgets, capital improvement or infrastructure planning programs, wildfire plans, floodplain procedures, emergency management plans and materials, or outreach products are prepared or amended, the responsible function will evaluate relevant hazard information and mitigation actions and record the mechanism reviewed, decision made, responsible function, and implementation status.

Plan Participant	Description
Panguitch City	During annual plan monitoring, Panguitch City will review selected actions with the applicable administrative, planning, public works, utility, building, floodplain, emergency management, finance, or elected functions identified in the capability assessment. When general or land-use plans, ordinances, development reviews, budgets, capital improvement or infrastructure planning programs, wildfire plans, floodplain procedures, emergency management plans and materials, or outreach products are prepared or amended, the responsible function will evaluate relevant hazard information and mitigation actions and record the mechanism reviewed, decision made, responsible function, and implementation status.
Town of Tropic	During annual plan monitoring, Town of Tropic will review selected actions with the applicable administrative, planning, public works, utility, building, floodplain, emergency management, finance, or elected functions identified in the capability assessment. When general or land-use plans, ordinances, development reviews, budgets, capital improvement or infrastructure planning programs, wildfire plans, floodplain procedures, emergency management plans and materials, or outreach products are prepared or amended, the responsible function will evaluate relevant hazard information and mitigation actions and record the mechanism reviewed, decision made, responsible function, and implementation status.

Continued Public Involvement

The plan participants are committed to implementing the maintenance process in the base plan and to providing continued opportunities for public involvement. Table 106 identifies each participant's approach.

Table 106: Continued Public Involvement Approach for Garfield County

Plan Participant	Approach
Garfield County	At least annually during plan monitoring and whenever a material amendment or five-year update is proposed, Garfield County will use official notices, public meetings, its website and other established electronic communication channels where available, and coordination with participating municipalities and Five County AOG to share implementation updates, provide access to proposed changes and draft materials, advertise opportunities for review, and accept public comments. The designated plan-maintenance representative will collect comments through advertised written or electronic methods and public meetings, retain notices and draft-review records, compile comments received, and document how they were considered, including resulting revisions or the rationale for not making a change. If no comments are

Plan Participant	Approach
	received, the record will document the opportunity provided and that result.
Town of Antimony	At least annually during plan monitoring and whenever a material amendment or five-year update is proposed, Town of Antimony will use official notices, public meetings, its website and other established electronic communication channels where available, and coordination with Garfield County and Five County AOG to share implementation updates, provide access to proposed changes and draft materials, advertise opportunities for review, and accept public comments. The designated plan-maintenance representative will collect comments through advertised written or electronic methods and public meetings, retain notices and draft-review records, compile comments received, and document how they were considered, including resulting revisions or the rationale for not making a change. If no comments are received, the record will document the opportunity provided and that result.
Town of Boulder	At least annually during plan monitoring and whenever a material amendment or five-year update is proposed, Town of Boulder will use official notices, public meetings, its website and other established electronic communication channels where available, and coordination with Garfield County and Five County AOG to share implementation updates, provide access to proposed changes and draft materials, advertise opportunities for review, and accept public comments. The designated plan-maintenance representative will collect comments through advertised written or electronic methods and public meetings, retain notices and draft-review records, compile comments received, and document how they were considered, including resulting revisions or the rationale for not making a change. If no comments are received, the record will document the opportunity provided and that result.
Bryce Canyon City	At least annually during plan monitoring and whenever a material amendment or five-year update is proposed, Bryce Canyon City will use official notices, public meetings, its website and other established electronic communication channels where available, and coordination with Garfield County and Five County AOG to share implementation updates, provide access to proposed changes and draft materials, advertise opportunities for review, and accept public comments. The designated plan-maintenance representative will collect comments through advertised written or electronic methods and public meetings, retain notices and draft-review records, compile comments received, and document how they were considered, including resulting revisions or the rationale for not making a change. If no comments are received, the record will document the opportunity provided and that result.
Town of Cannonville	At least annually during plan monitoring and whenever a material amendment or five-year update is proposed, Town of Cannonville will use official notices, public meetings, its website and other established

Plan Participant	Approach
	electronic communication channels where available, and coordination with Garfield County and Five County AOG to share implementation updates, provide access to proposed changes and draft materials, advertise opportunities for review, and accept public comments. The designated plan-maintenance representative will collect comments through advertised written or electronic methods and public meetings, retain notices and draft-review records, compile comments received, and document how they were considered, including resulting revisions or the rationale for not making a change. If no comments are received, the record will document the opportunity provided and that result.
City of Escalante	At least annually during plan monitoring and whenever a material amendment or five-year update is proposed, City of Escalante will use official notices, public meetings, its website and other established electronic communication channels where available, and coordination with Garfield County and Five County AOG to share implementation updates, provide access to proposed changes and draft materials, advertise opportunities for review, and accept public comments. The designated plan-maintenance representative will collect comments through advertised written or electronic methods and public meetings, retain notices and draft-review records, compile comments received, and document how they were considered, including resulting revisions or the rationale for not making a change. If no comments are received, the record will document the opportunity provided and that result.
Town of Hatch	At least annually during plan monitoring and whenever a material amendment or five-year update is proposed, Town of Hatch will use official notices, public meetings, its website and other established electronic communication channels where available, and coordination with Garfield County and Five County AOG to share implementation updates, provide access to proposed changes and draft materials, advertise opportunities for review, and accept public comments. The designated plan-maintenance representative will collect comments through advertised written or electronic methods and public meetings, retain notices and draft-review records, compile comments received, and document how they were considered, including resulting revisions or the rationale for not making a change. If no comments are received, the record will document the opportunity provided and that result.

Plan Participant	Approach
Town of Henrieville	At least annually during plan monitoring and whenever a material amendment or five-year update is proposed, Town of Henrieville will use official notices, public meetings, its website and other established electronic communication channels where available, and coordination with Garfield County and Five County AOG to share implementation updates, provide access to proposed changes and draft materials, advertise opportunities for review, and accept public comments. The designated plan-maintenance representative will collect comments through advertised written or electronic methods and public meetings, retain notices and draft-review records, compile comments received, and document how they were considered, including resulting revisions or the rationale for not making a change. If no comments are received, the record will document the opportunity provided and that result.
Panguitch City	At least annually during plan monitoring and whenever a material amendment or five-year update is proposed, Panguitch City will use official notices, public meetings, its website and other established electronic communication channels where available, and coordination with Garfield County and Five County AOG to share implementation updates, provide access to proposed changes and draft materials, advertise opportunities for review, and accept public comments. The designated plan-maintenance representative will collect comments through advertised written or electronic methods and public meetings, retain notices and draft-review records, compile comments received, and document how they were considered, including resulting revisions or the rationale for not making a change. If no comments are received, the record will document the opportunity provided and that result.
Town of Tropic	At least annually during plan monitoring and whenever a material amendment or five-year update is proposed, Town of Tropic will use official notices, public meetings, its website and other established electronic communication channels where available, and coordination with Garfield County and Five County AOG to share implementation updates, provide access to proposed changes and draft materials, advertise opportunities for review, and accept public comments. The designated plan-maintenance representative will collect comments through advertised written or electronic methods and public meetings, retain notices and draft-review records, compile comments received, and document how they were considered, including resulting revisions or the rationale for not making a change. If no comments are received, the record will document the opportunity provided and that result.

Iron County Annex

County Profile

This County Profile provides an overview of Iron County's geographic, demographic, economic, and development characteristics to establish the context for hazard mitigation planning. This section describes the county's physical setting, population and housing trends, economic base, critical infrastructure, and land use patterns, all of which influence vulnerability to natural hazards. Understanding these baseline conditions helps identify where people and assets are located, how the county is developing, and which factors may increase or reduce risk over time. This information supports the hazard identification, vulnerability assessment, capability assessment, and mitigation strategy components of this plan by ensuring that mitigation actions are appropriately tailored to Iron County and its participating jurisdictions.

Geographic Setting and Communities

Iron County is located in southwestern Utah along the Nevada border and is bordered by Beaver, Garfield, Kane, and Washington Counties in Utah and by Lincoln County, Nevada. The county includes approximately 3,296.2 square miles of land area, making it the eleventh-largest county in Utah by land area. Iron County includes the incorporated communities of Brian Head, Cedar City, Enoch, Kanarraville, Paragonah, and Parowan, with Parowan serving as the county seat and Cedar City serving as the county's largest city and primary population, service, education, and employment center. The county's geography includes the arid Escalante Desert and Great Basin ranges in the west, agricultural valleys and rural settlements, the Interstate 15 corridor, the Markagunt Plateau, forested high-elevation areas, red rock formations, Cedar Breaks National Monument, Brian Head, Coal Creek, Ash Creek, and public lands that support recreation, tourism, grazing, forestry, and natural resource uses. These geographic conditions shape the county's hazard mitigation context because residents, visitors, transportation routes, utilities, emergency services, recreation areas, and agricultural assets are distributed across varied terrain, elevation ranges, climate zones, and development patterns.

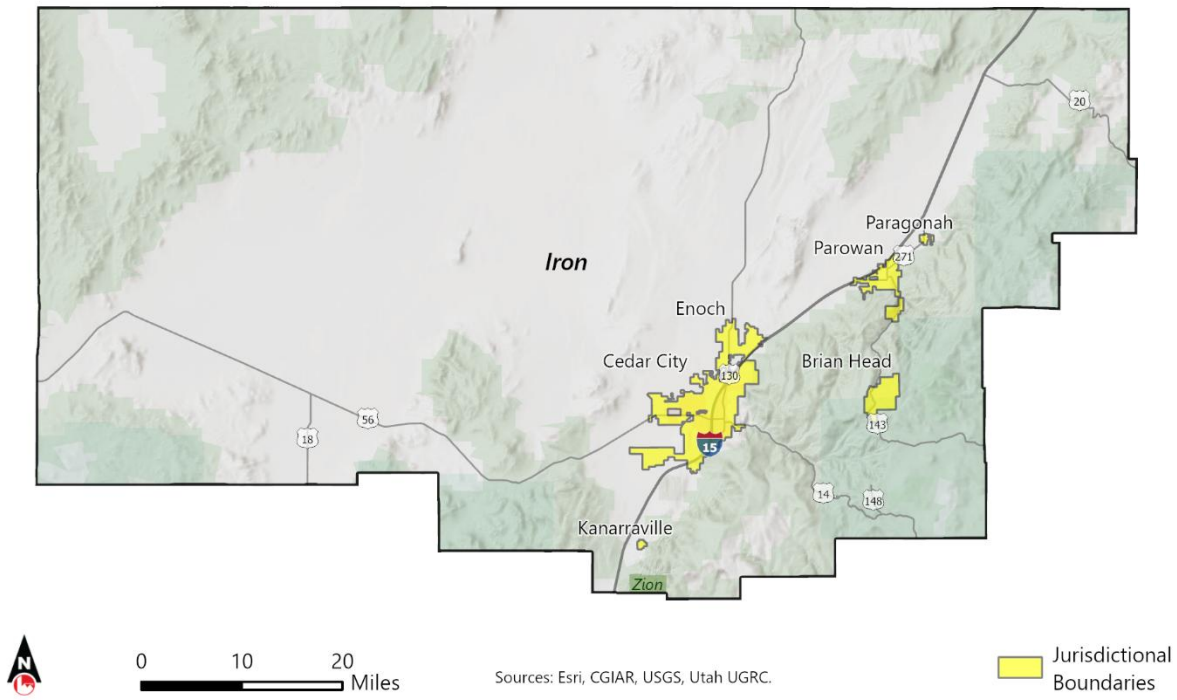


Figure 1: Iron County Jurisdictional Boundaries

Population and Housing

The U.S. Census Bureau estimated Iron County's population at 67,141 residents as of July 1, 2025, compared with the 2020 Decennial Census count of 57,289 residents. Iron County has experienced substantial recent growth while retaining a mix of urban, rural, agricultural, recreation-oriented, and unincorporated development patterns. The county had 26,038 housing units in 2025, a 2020–2024 owner-occupied housing unit rate of 68.3%, 20,157 households, and an average household size of 3.03 persons. Persons age 65 and over accounted for 15.3% of the population as reported in QuickFacts, while persons under age 18 accounted for 25.3%. These population and housing characteristics are important for mitigation planning because growth, student and workforce populations, older adults, families with children, seasonal and visitor-serving housing, and dispersed rural residences can affect warning, evacuation, sheltering, emergency medical access, utility restoration, transportation access, and recovery needs during hazard events.

Economy and Critical Infrastructure

Iron County's economy is supported by government and education, healthcare and social assistance, retail trade, construction, manufacturing, services, agriculture, recreation, and tourism. The U.S. Census Bureau reported 2022 retail sales of $1.162 billion, 2022 accommodation and food services sales of $157.503 million, and 2022 healthcare and social assistance receipts of $292.504 million, reflecting the importance

of regional services, healthcare, commerce, and visitor-serving activity to the local economy. State and local economic resources also identify government, education, trade, services, light manufacturing, construction, and tourism as important components of the county economy, with major attractions and destinations including Cedar Breaks National Monument, Brian Head Resort, Frontier Homestead State Park, the Utah Shakespeare Festival, Old Iron Town, Parowan Gap, and nearby public lands. Critical infrastructure serving the county includes county and municipal government facilities, schools, Southern Utah University, healthcare facilities, public safety and emergency response facilities, Interstate 15, state highways, local roads, bridges, culverts, Cedar City Regional Airport, water and wastewater systems, electric and natural gas systems, communications networks, dams and reservoirs, drainage systems, public works facilities, recreation infrastructure, trailheads, campgrounds, ski-area facilities, and visitor-serving facilities. Because infrastructure, services, and destinations are distributed across both concentrated urban areas and rural high-desert or mountain settings, disruptions to roads, utilities, communications, healthcare access, water systems, public safety facilities, education facilities, tourism destinations, or recreation access can have countywide consequences during floods, wildfire, winter storms, drought, earthquakes, landslides, severe weather, extreme heat, dam failure, or other hazards.

Land Use, Planning, and Mitigation Context

Iron County's land use and mitigation context is shaped by rapid growth, the Cedar City and Interstate 15 corridor, rural agricultural valleys, small incorporated communities, high-elevation resort and recreation areas, public lands, mining and industrial areas, and dispersed unincorporated development. Iron County's Planning Department is responsible for land use and regulations, including zoning, subdivisions, and special land use permits, and coordinates Planning Commission discussions and meetings. The county's general planning framework addresses land use, housing, environment, transportation, public facilities and services, development agreements, tier regulations, and development conditions for significant projects. For Iron County, future development and redevelopment should consider wildfire exposure, flood and drainage corridors, alluvial fans, low-water crossings, steep slopes, landslide and rockfall areas, problem soils, drought and water supply conditions, extreme heat exposure, winter access and snow loading in higher elevations, seismic risk, dam inundation areas, emergency access, visitor evacuation and sheltering needs, and protection of community lifelines and critical facilities. These considerations are especially important where population growth, housing, student and workforce needs, short-term lodging, resort development, rural residential development, agricultural activity, utilities, and transportation routes overlap with wildland-urban interface areas, drainage corridors, mountain roads, limited redundant access routes, and areas with existing or planned infrastructure constraints.

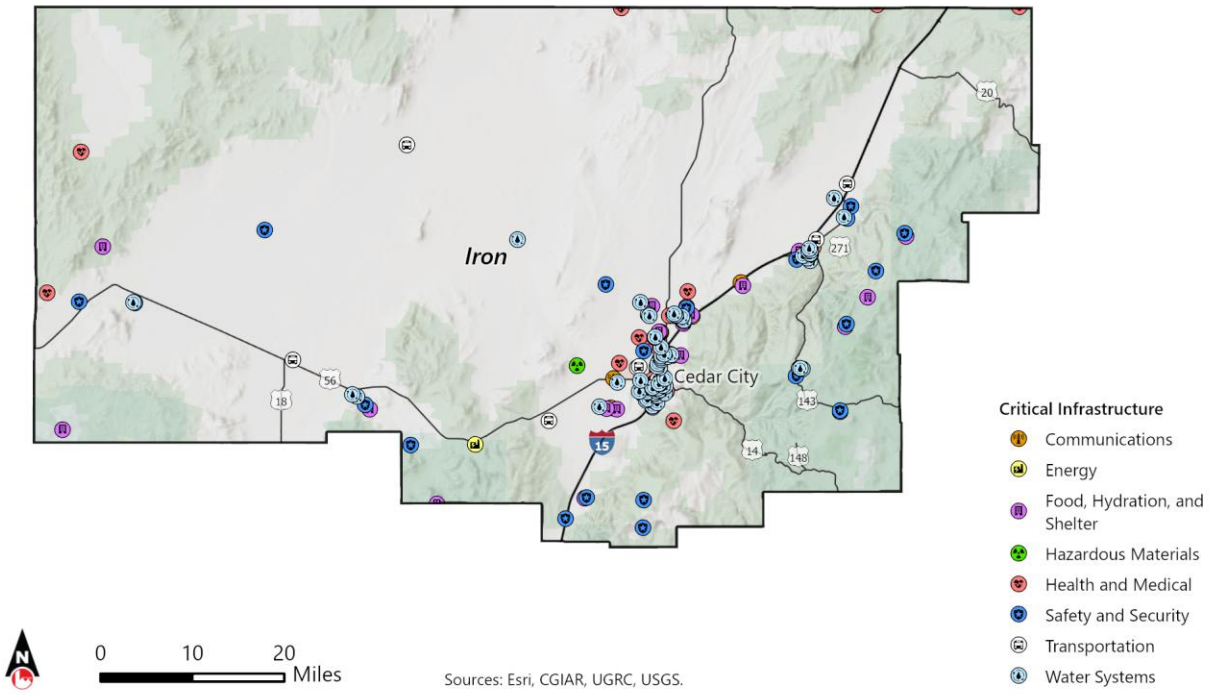


Figure 51: Iron County Critical Infrastructure Map

Hazard Identification

Each plan participant reviewed the hazards identified for the Five County Region. As shown in Table 107, no participant-specific omission is documented; therefore, all 14 regional hazards are carried forward for each Iron County participant. The participating jurisdictions are Iron County, Brian Head, Cedar City, Enoch, Paragonah, and Parowan, consistent with the regional planning roster. Kanarraville entries supply geographic context and do not establish participation or municipal commitments. The base plan provides the regional hazard descriptions, locations, extents, previous occurrences, and probabilities, while this annex documents how vulnerability and impacts vary among participants.

Table 107: Rationale for Participants Omitting Hazards in Iron County

Plan Participant	Hazards Carried Forward	Applicability Determination
Unincorporated Iron County	Dam Failure; Damaging Winds; Drought; Earthquake; Extreme Heat; Flooding; Hail; Landslide; Problem Soils; Radon Gas; Thunderstorms and Lightning; Tornadoes; Wildfire; Winter Storms	No participant-specific omission is documented; all regional hazards are carried forward.

Plan Participant	Hazards Carried Forward	Applicability Determination
Brian Head Town	Dam Failure; Damaging Winds; Drought; Earthquake; Extreme Heat; Flooding; Hail; Landslide; Problem Soils; Radon Gas; Thunderstorms and Lightning; Tornadoes; Wildfire; Winter Storms	No participant-specific omission is documented; all regional hazards are carried forward.
Cedar City	Dam Failure; Damaging Winds; Drought; Earthquake; Extreme Heat; Flooding; Hail; Landslide; Problem Soils; Radon Gas; Thunderstorms and Lightning; Tornadoes; Wildfire; Winter Storms	No participant-specific omission is documented; all regional hazards are carried forward.
Enoch City	Dam Failure; Damaging Winds; Drought; Earthquake; Extreme Heat; Flooding; Hail; Landslide; Problem Soils; Radon Gas; Thunderstorms and Lightning; Tornadoes; Wildfire; Winter Storms	No participant-specific omission is documented; all regional hazards are carried forward.
Town of Kanarraville (regional context)	Dam Failure; Damaging Winds; Drought; Earthquake; Extreme Heat; Flooding; Hail; Landslide; Problem Soils; Radon Gas; Thunderstorms and Lightning; Tornadoes; Wildfire; Winter Storms	No participant-specific omission is documented; all regional hazards are carried forward.
Town of Paragonah	Dam Failure; Damaging Winds; Drought; Earthquake; Extreme Heat; Flooding; Hail; Landslide; Problem Soils; Radon Gas; Thunderstorms and Lightning; Tornadoes; Wildfire; Winter Storms	No participant-specific omission is documented; all regional hazards are carried forward.
Parowan City	Dam Failure; Damaging Winds; Drought; Earthquake; Extreme Heat; Flooding; Hail; Landslide; Problem Soils; Radon Gas; Thunderstorms and Lightning; Tornadoes; Wildfire; Winter Storms	No participant-specific omission is documented; all regional hazards are carried forward.

Vulnerability and Impact Assessment

The vulnerability assessment identifies what assets, including structures, systems, populations, and other community assets as identified by the community, are at risk from the hazards identified in the plan. The

impact assessment describes the potential consequences or effects each hazard could have on the identified assets. A thorough understanding of the vulnerabilities and impacts of each hazard enables the development of effective, targeted mitigation actions to address the specific concerns of each plan participant. Countywide maps and figures in the County Profile provide planning context for jurisdictional boundaries and critical infrastructure; they do not independently establish site-specific hazard exposure. More detailed information on hazard location, extent, previous occurrences, probability, and the regional risk context is included in the base plan, while this annex explains participant-specific vulnerabilities and impacts. Facility and infrastructure entries are qualitative planning considerations drawn from the annex inventory. They identify asset types and potential service consequences; they do not represent a verified complete current inventory, a mapped exposure count, or a modeled loss estimate. Inclusion in a county or municipality does not establish that a facility lies within a particular hazard footprint.

Dam Failure

Table 108 summarizes dam-failure vulnerabilities and potential impacts for Iron County participants.

Table 108: Dam Failure Vulnerability and Impact Assessment for Iron County

Plan Participant	Vulnerabilities and Impacts
Unincorporated Iron County	**Vulnerabilities:** Unincorporated Iron County contains downstream areas, agricultural valleys, rural roads, culverts, bridges, utilities, public land access routes, and dispersed residences that may be exposed to dam failure or emergency releases. The Utah Division of Water Rights listing identifies multiple dams in Iron County, including high-hazard structures such as Yankee Meadow, Newcastle, Red Creek, Fiddler Canyon debris basins, Stephens Canyon debris basins, Dry Canyon debris basin, and Leigh Hill Reservoir. Rural areas downstream of reservoirs, debris basins, irrigation impoundments, and drainage corridors are vulnerable where floodwaters could move through Parowan Valley, Cedar Valley, Coal Creek, Ash Creek, Quichapa Lake/Quichapa flood area, and other washes before crossing county roads, state highways, or utility corridors. **Impacts:** A dam failure or emergency release could cause injury or loss of life, rapid flooding, erosion, debris deposition, damage to homes and agricultural assets, road washouts, bridge and culvert damage, and disruption to water, wastewater, electric, gas, and communications infrastructure. Countywide impacts could include closure or damage to Interstate 15, SR-56, SR-130, SR-143, SR-14, local county roads, Iron County maintained roads, Union Pacific rail connections, Cedar City Regional Airport access, and public safety response routes. Disruptions could isolate rural residents, delay emergency response, affect livestock and irrigation systems, interrupt freight and visitor travel, and create significant debris removal, infrastructure repair, and recovery needs.
Brian Head Town	**Vulnerabilities:** Brian Head Town is located in a high-elevation mountain and resort setting where local reservoirs, ponds, drainage facilities, steep terrain,

Plan Participant	Vulnerabilities and Impacts
	ski-area infrastructure, public works facilities, utilities, and access roads may be exposed to dam failure, pond failure, or sudden releases from upstream impoundments and stormwater systems. The Utah Division of Water Rights listing identifies Brian Head Town and Brian Head Phase III dams as significant-hazard structures, and the community's steep slopes, limited access routes, seasonal visitation, lodging, and dependence on SR-143 increase vulnerability if flows, debris, or road damage affect downstream or adjacent developed areas. **Impacts:** A dam or impoundment failure affecting Brian Head could damage local roads, culverts, drainageways, water and sewer infrastructure, electric and communications systems, resort facilities, lodging, public safety access, and ski-area or recreation infrastructure. Impacts could include evacuation needs, temporary isolation of residents and visitors, closure of SR-143 or local mountain roads, disruption to emergency medical and fire response, damage to public works systems, and economic losses to lodging, tourism, resort operations, and seasonal businesses.
Cedar City	**Vulnerabilities:** Cedar City contains Iron County's largest concentration of residents, businesses, schools, Southern Utah University, healthcare access, public safety facilities, municipal utilities, transportation infrastructure, and visitor-serving activity. The city is vulnerable to dam failure where floodwaters or emergency releases from nearby reservoirs, debris basins, and drainage-control structures could move through Coal Creek, Fiddler Canyon, Dry Canyon, Stephens Canyon, and other drainage corridors into developed areas. High-hazard dams and debris basins identified in the National Inventory of Dams, including Fiddler Canyon, Dry Canyon, Stephens Canyon, and Greens Lake structures, increase the importance of downstream emergency planning and infrastructure protection. **Impacts:** A dam failure or emergency release affecting Cedar City could damage homes, businesses, schools, Southern Utah University facilities, public buildings, water and wastewater systems, storm drainage facilities, electric and communications infrastructure, and transportation routes. Flooding could affect Interstate 15, SR-14, SR-56, SR-130/Main Street connections, Cross Hollow Road, local arterials, Union Pacific rail connections, transload and industrial facilities, Cedar City Regional Airport access, and emergency response routes. Potential consequences include injuries, evacuation, business interruption, school or campus closures, utility outages, hazardous travel, debris cleanup, and disruption to countywide services concentrated in Cedar City.
Enoch City	**Vulnerabilities:** The Enoch City is located north of Cedar City in Cedar Valley, where residential neighborhoods, schools, municipal facilities, local roads, utilities, drainage corridors, and planned transportation connections may be exposed to downstream flooding from dam failure or emergency releases occurring in the broader Cedar Valley watershed. Enoch's growth, low-gradient valley setting, and reliance on local road connections to I-15, SR-130, Midvalley Road, and the future Cedar Valley Belt Route increase vulnerability

Plan Participant	Vulnerabilities and Impacts
	where floodwaters could overtop roads, damage culverts, or affect utility corridors. **Impacts:** A dam failure or emergency release affecting Enoch could flood homes, local streets, drainage facilities, schools, public buildings, water and wastewater infrastructure, electric and communications systems, and access routes. Impacts could include road closures, damage to culverts and crossings, interruption of municipal services, delayed emergency response, disruption to school and community operations, and reduced access between Enoch, Cedar City, and I-15. Flooding could also affect future corridor improvements and local development areas if drainage and emergency access are compromised.
Town of Kanarraville (regional context)	**Vulnerabilities:** The Town of Kanarraville is located along the I-15 corridor near Kanarra Creek and canyon drainage areas, where homes, local roads, bridges, culverts, water facilities, utilities, trail access, and public safety routes may be exposed to rapid downstream flooding from dam failure, detention structure failure, or emergency releases in upstream watersheds. The town's small road network, proximity to steep canyon terrain, and dependence on access to I-15 and local crossings increase vulnerability during fast-moving flood conditions. **Impacts:** A dam failure or emergency release affecting Kanarraville could damage homes, local streets, culverts, bridges, water and sewer infrastructure, electric and communications lines, trailhead and recreation access, and agricultural or open-space areas. Impacts could include evacuation, temporary isolation, closure of local access to I-15, delayed fire and emergency medical response, debris and sediment removal needs, disruption to residents and visitors, and repair costs for drainage, road, and utility systems.
Town of Paragonah	**Vulnerabilities:** The Town of Paragonah is located in Parowan Valley near drainage and irrigation systems that support agricultural lands, rural roads, local utilities, homes, and community facilities. Paragonah may be vulnerable to dam failure or emergency releases associated with upstream reservoirs, irrigation storage, and drainage systems that could convey flows through Parowan Valley. Local vulnerability is increased where floodwaters could affect SR-271/old highway connections, nearby I-15 access, local streets, culverts, irrigation ditches, and utility crossings. **Impacts:** A dam failure or emergency release affecting Paragonah could flood homes, agricultural lands, local roads, culverts, irrigation infrastructure, water systems, electric and communications lines, and community facilities. Potential impacts include road closures, reduced access to I-15 or neighboring communities, damage to fields and livestock areas, disruption of municipal and emergency services, sediment deposition, erosion, and repair costs for public works, drainage, irrigation, and utility infrastructure.
Parowan City	**Vulnerabilities:** Parowan City is vulnerable to dam failure and emergency releases because it is located near Parowan Creek, Parowan Valley agricultural

Plan Participant	Vulnerabilities and Impacts
	lands, municipal water infrastructure, local roads, public buildings, and transportation routes serving Parowan Canyon and Brian Head. The Parowan Reservoir Company identifies water sources including Yankee Meadow Reservoir and drainage from Parowan Canyons, and the Utah Division of Water Rights listing identifies Yankee Meadow as a high-hazard dam. Development, roads, bridges, culverts, irrigation systems, utilities, and visitor access routes are vulnerable where downstream flows could move through canyon and valley drainage corridors. **Impacts:** A dam failure or emergency release affecting Parowan could damage homes, businesses, public buildings, local roads, bridges, culverts, water and wastewater systems, irrigation infrastructure, electric and communications systems, and access routes to I-15, SR-143, Parowan Canyon, and Brian Head. Impacts could include public safety risks, evacuations, disruption to municipal services, road closures, damage to agricultural lands, interruption of visitor travel, delayed emergency response, and substantial repair, debris removal, and recovery costs.

Damaging Winds

Table 109 summarizes damaging-wind vulnerabilities and potential impacts for Iron County participants.

Table 109: Damaging Winds Vulnerability and Impact Assessment for Iron County

Plan Participant	Vulnerabilities and Impacts
Unincorporated Iron County	**Vulnerabilities:** Dispersed residences, manufactured homes, agricultural buildings, barns, public facilities, communications sites, utility corridors, road signs, and exposed transportation routes may be affected by severe straight-line winds and downbursts. **Impacts:** Damaging winds could damage roofs, outbuildings, power and communications infrastructure, trees, signs, vehicles, and agricultural assets; block county roads and state highways; cause utility outages; and delay emergency response.
Brian Head Town	**Vulnerabilities:** Lodging, resort facilities, ski-area infrastructure, utilities, signs, forested slopes, and the limited SR-143 access corridor are exposed to high winds in a mountain setting. **Impacts:** Wind could damage roofs, equipment, communications and electric systems, down trees, interrupt resort operations, and restrict access for residents, visitors, responders, and utility crews.
Cedar City	**Vulnerabilities:** Concentrated homes, businesses, schools, Southern Utah University, healthcare and public safety facilities, airport and industrial assets, utilities, and major transportation corridors are exposed to damaging winds.

Plan Participant	Vulnerabilities and Impacts
	Impacts: Wind could damage buildings, signs, trees, vehicles, airport and industrial facilities, electric and communications systems, and disrupt I-15, state routes, local arterials, airport operations, emergency response, education, healthcare, and business activity.
Enoch City	**Vulnerabilities:** Residential neighborhoods, schools, municipal facilities, utilities, construction sites, and developing areas along SR-130 and local corridors are exposed to severe winds. **Impacts:** Wind could damage roofs, trees, signs, utility systems, construction materials, and public facilities; produce outages and debris; and disrupt school, municipal, transportation, and emergency response operations.
Town of Kanarraville (regional context)	**Vulnerabilities:** Homes, outbuildings, trailhead facilities, utilities, signs, agricultural assets, and I-15 access routes are exposed to severe winds emerging from canyon and corridor settings. **Impacts:** Wind could damage structures, utilities, trees, vehicles, and recreation facilities; create road debris; interrupt power or communications; and delay emergency access.
Town of Paragonah	**Vulnerabilities:** Homes, public buildings, barns, livestock facilities, irrigation equipment, utilities, and open agricultural lands in Parowan Valley are exposed to severe winds. **Impacts:** Wind could damage roofs, outbuildings, agricultural equipment, fences, trees, power and communications lines, and disrupt local roads, agricultural operations, and emergency response.
Parowan City	**Vulnerabilities:** Homes, businesses, schools, municipal facilities, utilities, agricultural assets, and travel routes through Parowan Valley and Parowan Canyon are exposed to damaging winds. **Impacts:** Wind could damage buildings, signs, trees, utilities, irrigation equipment, vehicles, and public facilities; cause outages and debris; and disrupt I-15 access, SR-143, visitor travel, municipal services, and emergency response.

Drought

Table 110 summarizes drought vulnerabilities and potential impacts for Iron County participants.

Table 110: Drought Vulnerability and Impact Assessment for Iron County

Plan Participant	Vulnerabilities and Impacts
Unincorporated Iron County	**Vulnerabilities:** Unincorporated Iron County contains large agricultural areas, grazing lands, dispersed residences, private wells, small water systems, irrigation infrastructure, public lands, recreation areas, and wildfire-prone

Plan Participant	Vulnerabilities and Impacts
	vegetation that are exposed to prolonged precipitation deficits, reduced snowpack, low soil moisture, reduced streamflow, and declining groundwater availability. Iron County's Water Use and Preservation Element identifies reliance on arid-region aquifers in Cedar Valley, Parowan Valley, and Escalante Valley, with limited surface water from Coal Creek, and notes that historical overdraft has caused subsidence and fissures in Cedar Valley. Agricultural operations, domestic and municipal water systems, and other water-dependent assets can experience shortages during drought; no undated drought-affected population percentage is used. **Impacts:** Drought could reduce water available for domestic use, irrigation, livestock watering, fire suppression, dust control, recreation, and ecosystem health. Impacts in unincorporated areas could include reduced crop and forage productivity, increased feed and hauling costs for ranchers, drying of springs or stock water, lower aquifer recharge, declining private well reliability, greater wildfire potential on public and private lands, air quality and dust concerns along unpaved county roads, and increased stress on water providers and emergency services. Critical infrastructure and transportation networks that may be indirectly affected include county roads, I-15 access routes, SR-56, SR-130, SR-143, SR-14, irrigation canals and ditches, culinary water systems, wellfields, recharge basins, electric distribution lines, communications facilities, and public safety response routes where drought-driven wildfire, dust, or water shortages disrupt service or access.
Brian Head Town	**Vulnerabilities:** Brian Head Town is vulnerable to drought because the community depends on reliable mountain snowpack, local water storage, wells or water system facilities, and high-elevation watershed conditions to support year-round residents, seasonal visitors, resort operations, lodging, fire protection, and public services. Reduced snowpack, earlier runoff, dry vegetation, and lower soil moisture can affect municipal water supply, ski-area operations, wildfire conditions, slope vegetation, and recreation-based economic activity. The town's high-elevation setting and limited access via SR-143 increase vulnerability if drought contributes to wildfire, water restrictions, reduced winter recreation reliability, or utility disruption. **Impacts:** Drought could reduce water available for domestic use, lodging, snowmaking or recreation support where applicable, landscaping, public facilities, and wildfire suppression. Impacts could include increased water conservation needs, stress on water storage and distribution systems, reduced visitor activity during poor snow or dry recreation seasons, increased wildfire risk near homes, lodging, ski infrastructure, and forested public lands, and higher operating costs for the town and resort-related businesses. Critical infrastructure and transportation impacts could include strain on Brian Head water facilities, fire protection water supplies, communications and electric infrastructure serving the resort community, SR-143, local mountain roads, emergency access routes, and public works systems that support residents and visitors.

Plan Participant	Vulnerabilities and Impacts
Cedar City	**Vulnerabilities:** Cedar City contains the county's largest concentration of residents, businesses, Southern Utah University, schools, healthcare access, emergency services, public buildings, industrial areas, and municipal water demand. The city is vulnerable because Cedar Valley groundwater has been identified as overdrawn, with a state groundwater management plan requiring reduced depletion to reach safe yield. Local water providers have documented drought concerns, low snow water equivalent, aquifer decline, recharge limitations, and the need for conservation, reuse, recharge, storage, and diversified supply projects serving Cedar City, Enoch, and surrounding areas. **Impacts:** Drought affecting Cedar City could increase municipal water restrictions, reduce outdoor water use, stress wells, storage tanks, recharge projects, waterlines, wastewater reuse planning, parks, schools, public facilities, healthcare facilities, and commercial or industrial users. Impacts could include higher water costs, delayed development if water rights or supply are constrained, reduced irrigation for parks and landscaping, increased wildfire risk near Cedar Highlands and canyon-adjacent areas, dust and air quality concerns, and greater demand for public communication and conservation enforcement. Critical infrastructure and transportation concerns include the Cedar City water system, wastewater treatment and reuse infrastructure, recharge sites near Coal Creek, Quichapa Lake/Quichapa Creek, Horse Alley, the airport area, Cedar City Regional Airport, I-15, SR-14, SR-56, SR-130/Main Street, Iron Springs Road, 4000 North, 6000 North, industrial corridors, Union Pacific rail connections, public safety facilities, and utility corridors that support countywide services.
Enoch City	**Vulnerabilities:** The Enoch City is vulnerable to drought because it is part of the Cedar Valley growth area and relies on municipal water supply, groundwater, regional water infrastructure, and conservation measures to serve residential neighborhoods, schools, parks, public buildings, and future development. Drought can reduce recharge, increase outdoor water demand, stress groundwater management efforts, and place additional pressure on shared regional infrastructure serving Cedar City, Enoch, Iron County, and the Central Iron County Water Conservancy District service area. **Impacts:** Drought could increase water conservation requirements, limit outdoor irrigation, stress municipal wells and storage, affect parks and landscaping, increase costs for water system operation, and constrain development where adequate water supply must be demonstrated. Reduced soil moisture and dry vegetation could increase wildfire risk along open lands, utility corridors, and rural edges of the city. Critical infrastructure and transportation impacts could include stress on Enoch water facilities, shared regional waterlines and storage projects, wastewater and reuse planning, I-15 access, SR-130, Midvalley Road, local arterials, school access routes, public safety routes, electric and communications systems, and future transportation corridors where water limitations, wildfire, or dust affect service continuity and growth planning.

Plan Participant	Vulnerabilities and Impacts
Town of Kanarraville (regional context)	**Vulnerabilities:** The Town of Kanarraville is vulnerable to drought because residents, local services, small-scale agricultural uses, canyon recreation access, private wells or local water systems, and surrounding vegetation depend on reliable precipitation, watershed conditions, and groundwater or spring-fed supplies. The town's location near Kanarra Creek, canyon terrain, I-15, and wildland fuels increases vulnerability where drought reduces water availability, dries vegetation, increases fire danger, and affects recreation and emergency response conditions. **Impacts:** Drought could reduce local water supply reliability, increase conservation needs, stress landscaping and small agricultural uses, reduce stream or spring flows, and increase wildfire potential near homes, trail access, canyon drainages, and the I-15 corridor. Impacts could include higher costs for water management, increased dust, reduced recreation quality, and greater demand for fire suppression water during dry lightning or human-caused ignitions. Critical infrastructure and transportation networks that may be affected include the town water system, wells or spring collection facilities, local roads and bridges, Kanarra Creek access areas, I-15 interchanges and frontage access, electric and communications lines, fire response routes, and trailhead or visitor parking areas.
Town of Paragonah	**Vulnerabilities:** The Town of Paragonah is vulnerable to drought because the community is located in Parowan Valley, where municipal water supplies, private wells, irrigation systems, agricultural lands, livestock operations, local roads, and rural utility systems depend on groundwater, seasonal runoff, and irrigation water availability. Drought can reduce soil moisture, lower forage quality, limit irrigation supply, increase pumping costs, and stress agricultural and domestic water systems serving the town and surrounding lands. **Impacts:** Drought could reduce water available for domestic use, irrigation, livestock watering, crop production, landscaping, and fire suppression. Potential impacts include reduced hay or forage production, increased feed and water costs for producers, stress on wells and water delivery systems, dust from dry fields and roads, increased wildfire risk in grass and brush areas, and reduced reliability of local public services if water or power systems are stressed. Critical infrastructure and transportation concerns include Paragonah's local water system, wells, irrigation ditches, agricultural access roads, SR-271/old highway connections, nearby I-15 access, local streets, electric and communications lines, and fire or emergency response routes.
Parowan City	**Vulnerabilities:** Parowan City is vulnerable to drought because municipal water supplies, irrigation systems, agricultural lands, public facilities, local businesses, schools, homes, and recreation access rely on Parowan Creek, Parowan Valley groundwater, snowpack-fed runoff, and water storage associated with Parowan Canyon and nearby mountain watersheds. Drought can reduce snowpack, decrease runoff, stress Yankee Meadow Reservoir and other water sources, reduce aquifer recharge, and increase wildfire potential

Plan Participant	Vulnerabilities and Impacts
	along Parowan Canyon, SR-143, agricultural lands, and the Brian Head travel corridor. **Impacts:** Drought could increase municipal conservation needs, reduce irrigation deliveries, affect livestock and crop production, stress wells and storage systems, reduce water available for fire suppression, and increase costs for water management and agricultural operations. Impacts could also include reduced recreation quality, lower reservoir or stream levels, dust and air quality concerns, and greater wildfire risk affecting homes, utilities, and visitor access. Critical infrastructure and transportation networks that may be affected include Parowan's water system, irrigation ditches, wells, wastewater infrastructure, public buildings, SR-143, I-15 access, Parowan Canyon Road, local streets, bridges and culverts, electric and communications systems, and emergency response routes serving Parowan, Parowan Canyon, and Brian Head.

Earthquake

Table 111 summarizes earthquake vulnerabilities and potential impacts for Iron County participants.

Table 111: Earthquake Vulnerability and Impact Assessment for Iron County

Plan Participant	Vulnerabilities and Impacts
Unincorporated Iron County	**Vulnerabilities:** Unincorporated Iron County contains dispersed residences, agricultural facilities, public lands infrastructure, utility corridors, communications sites, irrigation systems, dams and reservoirs, bridges, culverts, and hundreds of miles of county-maintained roads that may be affected by earthquake ground shaking. Utah Geological Survey mapping identifies earthquake-related hazards, faulting, landslides, rockfall, liquefaction, shallow groundwater, and other geologic hazards within portions of Iron County. Rural communities, canyon corridors, and transportation routes may be vulnerable where seismic shaking damages embankments, roadways, bridges, utility crossings, water infrastructure, or slopes susceptible to rockfall and landslides. Critical facilities and infrastructure exposed to earthquake impacts include county government facilities, emergency response facilities, communications infrastructure, water systems, irrigation facilities, dams, reservoirs, electrical distribution systems, and public works assets. **Impacts:** Earthquakes could cause structural damage, utility outages, transportation disruptions, ground cracking, rockfall, landslides, and damage to water and irrigation infrastructure. Critical infrastructure and transportation networks that may be affected include Interstate 15, SR-14, SR-56, SR-130, SR-143, county-maintained roads, bridges, culverts, utility corridors, communications facilities, dams, reservoirs, and emergency response routes. Secondary impacts could include isolation of rural areas, interruption of

Plan Participant	Vulnerabilities and Impacts
	emergency communications, damage to agricultural infrastructure, prolonged utility restoration needs, and increased repair and recovery costs.
Brian Head Town	**Vulnerabilities:** Brian Head Town is vulnerable to earthquake impacts because of its mountainous terrain, steep slopes, resort facilities, lodging developments, utility systems, and limited transportation access. Seismic shaking may trigger rockfall, slope instability, or damage to roads, retaining structures, water systems, communications infrastructure, and public facilities. Seasonal populations, visitor-serving facilities, and reliance on a limited transportation network increase vulnerability if earthquake damage affects access into or out of the community. Critical infrastructure includes town facilities, water and wastewater infrastructure, electric and communications systems, resort facilities, lodging developments, and emergency response assets. **Impacts:** Earthquakes could damage lodging facilities, public buildings, utility systems, communications infrastructure, roads, bridges, and recreation assets. Critical transportation impacts may include damage or closures along SR-143 and local mountain roads, limiting emergency response and evacuation access. Additional impacts could include utility outages, interruption of tourism activity, damage to public works infrastructure, and increased response and recovery costs for residents, businesses, and visitors.
Cedar City	**Vulnerabilities:** Cedar City contains Iron County's largest concentration of residents, businesses, schools, healthcare facilities, Southern Utah University, public safety facilities, utilities, and transportation infrastructure. Utah Geological Survey hazard mapping identifies earthquake-related hazards and other geologic hazards throughout portions of Cedar Valley. Concentrated development, older structures, utility systems, schools, healthcare facilities, and critical public services increase vulnerability to seismic shaking. Critical infrastructure includes Southern Utah University facilities, schools, healthcare facilities, municipal buildings, water and wastewater systems, drainage infrastructure, public safety facilities, communications systems, industrial facilities, and Cedar City Regional Airport. **Impacts:** Earthquakes affecting Cedar City could damage homes, businesses, schools, university facilities, healthcare facilities, public buildings, utility systems, communications infrastructure, and industrial facilities. Critical transportation networks that may be affected include Interstate 15, SR-14, SR-56, SR-130/Main Street, Cross Hollow Road, Iron Springs Road, 4000 North, 6000 North, Union Pacific rail connections, and Cedar City Regional Airport access. Potential consequences include utility outages, disruption of public services, hazardous travel conditions, interruption of healthcare and educational services, emergency response delays, and significant recovery costs.
Enoch City	**Vulnerabilities:** The Enoch City is vulnerable because residential neighborhoods, schools, public facilities, utility systems, and transportation corridors are located within the rapidly developing Cedar Valley area.

Plan Participant	Vulnerabilities and Impacts
	Earthquake shaking may damage structures, utilities, roadways, and municipal infrastructure. Continued growth increases the amount of infrastructure and population exposed to seismic hazards. Critical infrastructure includes municipal buildings, schools, water facilities, wastewater infrastructure, communications systems, electric distribution facilities, and transportation corridors serving the community. **Impacts:** Earthquakes could damage homes, schools, public buildings, water infrastructure, wastewater systems, utility corridors, and transportation facilities. Critical transportation impacts may affect SR-130, Midvalley Road, local arterials, I-15 access routes, school access routes, and emergency response corridors. Additional impacts could include utility outages, interruption of municipal services, delays in emergency response, and increased repair and reconstruction costs.
Town of Kanarraville (regional context)	**Vulnerabilities:** The Town of Kanarraville is vulnerable because homes, utilities, local roads, bridges, public facilities, and recreation access routes are located near steep terrain and canyon environments where earthquake shaking may trigger rockfall, slope instability, or infrastructure damage. The town's small transportation network and reliance on regional transportation access increase vulnerability if seismic impacts damage roadways or utilities. Critical infrastructure includes water facilities, communications infrastructure, local roads, bridges, public facilities, and emergency response routes. **Impacts:** Earthquakes could damage homes, water infrastructure, utilities, roads, bridges, culverts, and public facilities. Transportation impacts may affect local roads, I-15 access routes, canyon access routes, and emergency response corridors. Potential consequences include utility outages, temporary isolation, disruption of recreation access, delayed emergency response, and increased public works and infrastructure repair costs.
Town of Paragonah	**Vulnerabilities:** The Town of Paragonah is vulnerable because residential areas, agricultural infrastructure, irrigation facilities, local roads, utilities, and public facilities may be affected by earthquake ground shaking. Agricultural operations, irrigation systems, utility crossings, and transportation infrastructure may experience damage where seismic shaking affects foundations, pipelines, canals, or transportation corridors. Critical infrastructure includes the town water system, irrigation infrastructure, public buildings, electric and communications systems, and transportation facilities. **Impacts:** Earthquakes could damage homes, irrigation facilities, water systems, utility infrastructure, agricultural buildings, and public facilities. Transportation impacts may affect local streets, agricultural access roads, SR-271, nearby I-15 access routes, and emergency response corridors. Additional impacts could include interruption of municipal services, damage to agricultural operations, utility outages, and increased repair and recovery costs.
Parowan City	**Vulnerabilities:** Parowan City is vulnerable because homes, businesses, schools, public facilities, water systems, irrigation infrastructure, transportation

Plan Participant	Vulnerabilities and Impacts
	corridors, and visitor-serving facilities may be affected by earthquake shaking. Infrastructure associated with Parowan Canyon, Parowan Creek, local utilities, and transportation routes serving Brian Head and surrounding communities may be exposed to seismic impacts. Critical infrastructure includes municipal buildings, schools, water and wastewater systems, irrigation infrastructure, electric and communications systems, and transportation facilities. **Impacts:** Earthquakes could damage homes, businesses, schools, public facilities, utility systems, irrigation infrastructure, bridges, culverts, and transportation facilities. Critical transportation networks that may be affected include I-15 access routes, SR-143, Parowan Canyon Road, local streets, and routes connecting Parowan with Brian Head and surrounding communities. Potential consequences include utility outages, disruption of public services, delayed emergency response, interruption of visitor travel, and substantial infrastructure repair and recovery needs.

Extreme Heat

Table 112 summarizes extreme heat vulnerabilities and potential impacts for Iron County participants.

Table 112: Extreme Heat Vulnerability and Impact Assessment for Iron County

Plan Participant	Vulnerabilities and Impacts
Unincorporated Iron County	**Vulnerabilities:** Unincorporated Iron County includes dispersed residences, agricultural and ranching areas, public lands, recreation areas, trailheads, campgrounds, utility corridors, transportation routes, and remote work sites where residents, outdoor workers, emergency responders, livestock producers, visitors, and recreation users are exposed to high summer temperatures. Although Iron County's higher elevations moderate some conditions, the 1991–2020 NOAA climate normal for July mean daily maximum temperature at Cedar City Municipal Airport is 91.0°F, and local heat risk increases in lower-elevation valleys, open desert areas, agricultural fields, road corridors, and recreation areas with limited shade, water, communications, or nearby medical access. Older adults, young children, people with chronic health conditions, people without reliable cooling, outdoor workers, travelers, hikers, and residents in remote housing are especially vulnerable. **Impacts:** Extreme heat could cause dehydration, heat exhaustion, heat stroke, hospitalization, or death; increase demand for emergency medical services and public health messaging; stress livestock, crops, vegetation, and water supplies; raise demand for electricity and cooling; and worsen drought, wildfire, dust, and air quality conditions. Critical infrastructure and transportation networks that may be affected include I-15, SR-14, SR-56, SR-130, SR-143, county roads, public land access roads, agricultural access roads, electric distribution lines, communications facilities, water systems, wellfields,

Plan Participant	Vulnerabilities and Impacts
	public safety response routes, and recreation access areas where heat can affect travelers, workers, pavement conditions, vehicle reliability, and emergency response times.
Brian Head Town	**Vulnerabilities:** Brian Head Town is exposed to extreme heat differently than lower-elevation communities because its mountain setting generally has cooler temperatures but includes outdoor recreation, summer tourism, trail use, construction, public works activity, wildfire preparedness work, and visitors who may underestimate sun exposure, dehydration, and exertion at elevation. Residents, seasonal workers, resort employees, emergency responders, hikers, cyclists, and visitors staying in lodging or vacation rentals are vulnerable when heat coincides with limited shade, dry vegetation, high solar exposure, wildfire smoke, or temporary utility interruptions. The town's reliance on SR-143 and local mountain roads also increases vulnerability if heat-related wildfire, vehicle breakdowns, or emergency calls affect access. **Impacts:** Extreme heat could increase heat-related illness among visitors, outdoor workers, recreation users, and emergency responders; increase water and electricity demand for lodging, public facilities, and resort services; stress vegetation and local water supplies; and contribute to elevated wildfire conditions around homes, ski-area infrastructure, utilities, and forested public lands. Potential infrastructure and access impacts include strain on Brian Head water facilities, electric and communications systems, public works operations, fire suppression resources, SR-143, local roads, trailheads, resort facilities, and emergency response routes serving residents and seasonal visitors.
Cedar City	**Vulnerabilities:** Cedar City contains the county's largest concentration of residents, students, older adults, children, people with chronic health conditions, workers, public facilities, healthcare access, businesses, industrial areas, schools, Southern Utah University, visitors, and municipal services. The city is vulnerable to extreme heat because population, pavement, parking areas, major roads, utility demand, and outdoor activity are concentrated in one location. Heat exposure is a concern for people without reliable air conditioning, outdoor workers, unhoused residents, athletes, students, visitors, and people relying on transit, walking, or outdoor recreation. **Impacts:** Extreme heat affecting Cedar City could increase heat-related illness, emergency department visits, EMS calls, cooling and hydration needs, electricity demand, water demand, and public communication needs. Impacts could include stress on schools, Southern Utah University facilities, healthcare facilities, senior housing, parks, events, construction sites, industrial employers, and visitor-serving businesses. Critical infrastructure and transportation networks that may be affected include the Cedar City water system, wastewater facilities, electric distribution network, communications systems, Cedar City Regional Airport, I-15, SR-14, SR-56, SR-130/Main Street, Cross Hollow Road, Iron Springs Road, 4000 North, 6000 North, local arterials, Union Pacific rail connections, public safety facilities, transit or shuttle routes, and emergency response corridors where heat can affect pavement, vehicles, workers, utility loads, and response operations.

Plan Participant	Vulnerabilities and Impacts
Enoch City	**Vulnerabilities:** The Enoch City is vulnerable to extreme heat because residential neighborhoods, schools, parks, public facilities, road corridors, open lands, and future growth areas are located in Cedar Valley where summer heat, limited shade, and high outdoor water demand can affect residents and municipal operations. Children, older adults, people with chronic health conditions, outdoor workers, athletes, households without reliable cooling, and residents in newer or exposed subdivisions are especially vulnerable. Development patterns along SR-130, Midvalley Road, and local roads can increase exposure where sidewalks, parking areas, construction sites, and utility corridors absorb and radiate heat. **Impacts:** Extreme heat could increase heat-related illness, demand for emergency response, cooling needs, drinking water demand, irrigation demand, and stress on municipal facilities, parks, schools, and public works operations. Heat can also worsen drought and wildfire conditions along open lands and utility corridors. Critical infrastructure and transportation networks that may be affected include Enoch's water system, wells, storage and distribution facilities, electric and communications infrastructure, schools, public buildings, parks, SR-130, Midvalley Road, I-15 access, local arterials, school access routes, public safety routes, and future transportation corridors where high heat may affect workers, vehicles, pavement, and utility loads.
Town of Kanarraville (regional context)	**Vulnerabilities:** The Town of Kanarraville is vulnerable to extreme heat because residents, visitors, hikers, trail users, outdoor workers, agricultural users, and emergency responders may be exposed to high temperatures in canyon, foothill, and I-15 corridor settings. Heat risk is increased where people are outdoors near Kanarra Creek, trailhead areas, local roads, open fields, and recreation access points with limited shade, limited water, and limited immediate medical access. Older adults, young children, visitors unfamiliar with local conditions, people without reliable cooling, and workers or recreation users exerting themselves during hot afternoons are especially vulnerable. **Impacts:** Extreme heat could cause heat-related illness among residents, hikers, outdoor workers, and visitors; increase demand for emergency medical response; strain local water supplies; stress vegetation and small agricultural uses; increase wildfire potential; and affect recreation activity. Critical infrastructure and transportation networks that may be affected include Kanarraville's water system, local streets, trailhead and visitor parking areas, Kanarra Creek access, I-15 interchanges and frontage access, local bridges and culverts, electric and communications lines, fire response routes, and mutual aid access routes where heat-related illness, wildfire, vehicle breakdowns, or limited water availability could delay response.
Town of Paragonah	**Vulnerabilities:** The Town of Paragonah is vulnerable to extreme heat because residents, older adults, children, outdoor workers, livestock operators, agricultural producers, public works staff, and travelers may be exposed to high temperatures across Parowan Valley. Heat exposure is greatest in open agricultural areas, local roads, unshaded work sites, fields, irrigation facilities,

Plan Participant	Vulnerabilities and Impacts
	and homes without reliable cooling. The town's rural setting and reliance on nearby I-15 access, local streets, small water systems, agricultural infrastructure, and emergency response connections increase vulnerability where heat coincides with drought, wildfire conditions, or utility outages. **Impacts:** Extreme heat could increase heat-related illness among residents, workers, and older adults; stress livestock, crops, gardens, and landscaping; increase irrigation and drinking water demand; raise electricity use for cooling; and worsen drought, dust, and wildfire conditions in surrounding fields and grasslands. Critical infrastructure and transportation networks that may be affected include Paragonah's water system, wells, irrigation ditches, local streets, agricultural access roads, SR-271/old highway connections, nearby I-15 access, electric and communications systems, public buildings, and fire or emergency response routes where heat can affect workers, vehicles, water demand, and service continuity.
Parowan City	**Vulnerabilities:** Parowan City is vulnerable to extreme heat because residents, older adults, children, outdoor workers, agricultural producers, public works staff, recreation users, and visitors traveling between Parowan, Parowan Canyon, and Brian Head may be exposed to high summer temperatures. Heat risk is increased where homes, schools, public buildings, agricultural lands, local roads, trail access, and visitor routes depend on reliable water, cooling, electricity, and emergency access. Parowan's location near I-15, SR-143, Parowan Canyon Road, agricultural lands, and canyon recreation areas increases vulnerability when extreme heat coincides with wildfire danger, drought, or high visitor activity. **Impacts:** Extreme heat could increase heat-related illness, EMS calls, cooling needs, and water demand; stress crops, livestock, landscaping, and public facilities; increase electricity demand; and worsen drought and wildfire conditions along Parowan Canyon, SR-143, and surrounding open lands. Critical infrastructure and transportation networks that may be affected include Parowan's water system, wells, irrigation ditches, wastewater infrastructure, public buildings, schools, I-15 access, SR-143, Parowan Canyon Road, local streets, bridges, culverts, electric and communications systems, and emergency response routes serving Parowan, Parowan Canyon, and Brian Head.

Flooding

Table 113 summarizes flooding vulnerabilities and potential impacts for Iron County participants.

Table 113: Flooding Vulnerability and Impact Assessment for Iron County

Plan Participant	Vulnerabilities and Impacts
Unincorporated Iron County	**Vulnerabilities:** Unincorporated Iron County includes flood-prone washes, alluvial fans, agricultural valleys, irrigation channels, culverts, bridges, rural roads, public land access routes, dispersed residences, utilities, and transportation corridors that are exposed to flooding and flash flooding. The Utah Division of Emergency Management's Iron County Floodplain Mapping Project notes that effective regulatory maps for Iron County are based largely on older 1980s information and that more recent studies, LiDAR, base-level engineering, and best available data are being used to improve flood-risk understanding. County GIS resources identify floodplain mapping, Quichapa Flood Area Management, maintained roads, drinking water protection zones, and other infrastructure layers, while the Utah Geological Survey identifies flooding, debris flows, alluvial fan flooding, and shallow groundwater as hazards relevant to developed and rural areas. **Impacts:** Flooding could cause injury or loss of life, damage to homes and agricultural buildings, wash out roads and culverts, damage bridges, erode channels and road shoulders, deposit sediment and debris, disrupt irrigation systems, and interrupt water, wastewater, electric, gas, and communications infrastructure. Countywide impacts could include closures or damage along I-15, SR-14, SR-56, SR-130, SR-143, SR-271/old highway connections, county maintained roads, agricultural access roads, Union Pacific rail connections, Cedar City Regional Airport access, and public safety response routes. Flooding could isolate rural residents, strand visitors on public land or canyon access roads, disrupt freight and emergency response, damage wells and water systems, and create long-term debris removal, drainage repair, and infrastructure recovery needs.
Brian Head Town	**Vulnerabilities:** Brian Head Town is vulnerable to flooding from intense rainfall, rapid snowmelt, stormwater runoff, steep drainage channels, culvert capacity limits, debris flows, and localized ponding around roads, lodging, resort facilities, and public works infrastructure. The town's high-elevation mountain setting, steep slopes, ski-area terrain, seasonal visitor population, and limited access along SR-143 increase vulnerability where heavy rain or rain-on-snow events convey runoff, sediment, or debris across local roads, drainage systems, utilities, and developed areas. **Impacts:** Flooding in Brian Head could damage local roads, culverts, drainageways, retaining areas, water and sewer infrastructure, electric and communications systems, lodging, resort facilities, trailheads, and public works assets. Impacts could include closure or restriction of SR-143 and local mountain roads, isolated residents and visitors, reduced access for fire and emergency medical response, debris cleanup, erosion of shoulders and slopes, interruption of resort operations, and economic impacts to lodging, recreation, and seasonal businesses.
Cedar City	**Vulnerabilities:** Cedar City contains the county's largest concentration of residents, homes, businesses, schools, Southern Utah University, healthcare

Plan Participant	Vulnerabilities and Impacts
	access, public safety facilities, utilities, drainage systems, industrial areas, and transportation infrastructure. The city is vulnerable to flooding from Coal Creek, storm drain capacity limitations, canyon runoff, alluvial fan and sheet flow, shallow groundwater, and localized ponding in low-lying developed areas. NOAA's Coal Creek gauge identifies flood impacts for Coal Creek Canyon, Cedar City, and low-lying Cedar Valley areas at elevated stages, and Cedar City's official mapping resources include FEMA flood zones, storm drain, sewer, water, street, and groundwater source protection maps. **Impacts:** Flooding affecting Cedar City could damage homes, businesses, schools, Southern Utah University facilities, public buildings, parks, storm drains, water and wastewater systems, streets, bridges, culverts, vehicles, electric and communications infrastructure, and industrial facilities. Transportation and lifeline impacts could include closures or hazardous conditions along I-15, SR-14, SR-56, SR-130/Main Street, Cross Hollow Road, Iron Springs Road, 4000 North, 6000 North, local arterials, Union Pacific rail connections, Cedar City Regional Airport access, and emergency response corridors. Impacts could also include business interruption, school and campus closures, utility outages, contaminated floodwater cleanup, sediment removal, and disruption to countywide services concentrated in Cedar City.
Enoch City	**Vulnerabilities:** The Enoch City is vulnerable to flooding where residential neighborhoods, schools, public facilities, local roads, drainage channels, utility corridors, and future growth areas intersect Cedar Valley drainage patterns and low-gradient alluvial surfaces. Enoch's adopted flood damage prevention provisions identify a local floodplain administration role, and the Utah Geological Survey's Cedar Valley geologic hazards work identifies flooding and related geologic hazards as important considerations for the Cedar City, Enoch, and Kanarraville area. Growth along SR-130, Midvalley Road, local arterials, and planned transportation corridors increases vulnerability where drainage capacity, culverts, and stormwater routing must keep pace with development. **Impacts:** Flooding in Enoch could damage homes, roads, culverts, schools, parks, public buildings, water and wastewater infrastructure, electric and communications systems, and stormwater facilities. Impacts could include road closures, ponded water in neighborhoods, damage to drainage improvements, delayed emergency response, disruption to school and municipal operations, and reduced access between Enoch, Cedar City, I-15, SR-130, Midvalley Road, and future corridor improvements. Flooding could also increase maintenance costs and constrain development if drainage, floodplain, or access issues are not addressed during growth.
Town of Kanarraville (regional context)	**Vulnerabilities:** The Town of Kanarraville is vulnerable to flooding and flash flooding from Kanarra Creek, canyon runoff, localized cloudburst storms, steep drainage corridors, debris-laden flows, and low-water or culvert crossings. Homes, local streets, bridges, culverts, water facilities, utilities, trailhead access, visitor parking, agricultural lands, and I-15 access routes are vulnerable where floodwaters move from canyon terrain into the town and

Plan Participant	Vulnerabilities and Impacts
	across transportation or utility corridors. The town's small road network and reliance on I-15 and local crossings increase vulnerability during fast-moving flood events. **Impacts:** Flooding in Kanarraville could damage homes, local roads, bridges, culverts, water and sewer infrastructure, electric and communications lines, trailhead and recreation facilities, agricultural areas, and canyon access routes. Impacts could include public safety risks for residents and visitors, closure of local access to I-15, temporary isolation, delayed fire and emergency medical response, debris and sediment removal, washed-out crossings, disruption to recreation activity, and repair costs for roads, drainage, utilities, and public works systems.
Town of Paragonah	**Vulnerabilities:** The Town of Paragonah is vulnerable to flooding where homes, agricultural lands, irrigation ditches, local streets, culverts, drainage channels, utilities, and community facilities intersect Parowan Valley drainage patterns. The town participates in floodplain management through local flood damage prevention provisions and has an effective FIRM date identified in the capability assessment. Agricultural areas, livestock facilities, SR-271/old highway connections, nearby I-15 access, and irrigation infrastructure are vulnerable where intense rainfall, snowmelt, or drainage obstruction produces sheet flow, ponding, or channel flooding. **Impacts:** Flooding in Paragonah could damage homes, public facilities, local roads, culverts, irrigation ditches, fields, fences, livestock areas, water systems, electric and communications lines, and agricultural access routes. Potential impacts include road closures, reduced access to I-15 and neighboring communities, delayed emergency response, sediment deposition, erosion, crop and forage losses, interruption of municipal services, and increased public works, drainage, irrigation, and utility repair costs.
Parowan City	**Vulnerabilities:** Parowan City is vulnerable to flooding from Parowan Creek, Parowan Canyon runoff, snowmelt, cloudburst storms, alluvial fan drainage, irrigation infrastructure, and localized stormwater constraints. Homes, businesses, public buildings, schools, municipal water and wastewater systems, irrigation ditches, bridges, culverts, local roads, agricultural lands, and visitor travel routes are vulnerable where floodwaters move through canyon and valley drainage corridors. Parowan's flood damage prevention ordinance, effective FIRM information, and local floodplain administration responsibilities indicate that floodplain management remains an important local capability. **Impacts:** Flooding in Parowan could damage homes, businesses, public buildings, roads, bridges, culverts, water and wastewater systems, irrigation infrastructure, electric and communications systems, agricultural lands, and public facilities. Transportation impacts could include closures or hazardous conditions along I-15 access routes, SR-143, Parowan Canyon Road, local streets, and routes connecting Parowan to Brian Head and surrounding rural areas. Potential consequences include public safety risks, evacuation needs, reduced emergency response access, disruption to municipal services,

Plan Participant	Vulnerabilities and Impacts
	interruption of visitor travel and agricultural operations, sediment and debris cleanup, and long-term drainage, roadway, and utility repair costs.

Hail

Table 114 summarizes hail vulnerabilities and potential impacts for Iron County participants.

Table 114: Hail Vulnerability and Impact Assessment for Iron County

Plan Participant	Vulnerabilities and Impacts
Unincorporated Iron County	**Vulnerabilities:** Unincorporated Iron County includes dispersed homes, manufactured housing, barns, agricultural buildings, vehicles, farm equipment, utility infrastructure, public facilities, campgrounds, trailheads, livestock areas, crops, solar equipment, road signs, and recreation assets that are exposed to hail from severe thunderstorms. NOAA's Storm Events Database documents hail as a county-level severe weather event type, and NOAA/NSSL notes that hail can damage homes, cars, crops, and livestock. Vulnerability is increased where long travel distances, exposed agricultural fields, remote public land access roads, and limited local repair capacity affect response and recovery. **Impacts:** Hail could damage roofs, siding, windows, skylights, vehicles, farm machinery, irrigation equipment, utility equipment, communications facilities, traffic signs, fencing, solar panels, livestock shelters, forage, hay, and row crops. Transportation and infrastructure impacts could include hazardous driving on I-15, SR-14, SR-56, SR-130, SR-143, SR-271/old highway connections, county roads, public land access roads, agricultural access roads, and emergency response routes. Damage to vehicles, public works equipment, utility infrastructure, and agricultural assets could increase repair costs, delay emergency response, disrupt ranching and farming operations, and affect residents or visitors caught outdoors during severe thunderstorms.
Brian Head Town	**Vulnerabilities:** Brian Head Town is vulnerable to hail because lodging, resort buildings, ski-area and recreation infrastructure, vehicles, public works facilities, utility systems, communications equipment, signage, trailheads, and visitors outdoors are exposed to severe thunderstorms in a high-elevation mountain setting. Hail risk is increased where storms form rapidly over elevated terrain and affect residents, resort employees, seasonal visitors, hikers, cyclists, and motorists with limited shelter options along SR-143 or local mountain roads. **Impacts:** Hail could damage roofs, windows, vehicles, public works equipment, resort facilities, lift or operations support structures, signage, outdoor recreation equipment, utility lines, communications equipment, and visitor-serving assets. Impacts could include injuries to people caught outdoors, vehicle damage along SR-143 and local roads, reduced visibility and slick road surfaces, temporary interruption of resort operations, localized

Plan Participant	Vulnerabilities and Impacts
	power or communications disruptions, and repair costs for lodging, public buildings, roads, drainage facilities, and recreation infrastructure.
Cedar City	**Vulnerabilities:** Cedar City contains Iron County's largest concentration of residents, homes, apartments, businesses, schools, Southern Utah University facilities, healthcare facilities, public safety buildings, municipal facilities, vehicles, airport facilities, industrial buildings, utility systems, and visitor-serving uses. NCEI records document 1-inch hail in Enoch on July 14 and August 1, 2021, and 1.5-inch hail with damage reported from Cedar City to Enoch on October 2, 2022. This concentration of structures, vehicles, public facilities, and transportation assets increases vulnerability to localized hail damage. **Impacts:** Hail affecting Cedar City could damage roofs, windows, siding, HVAC equipment, solar panels, vehicles, school facilities, Southern Utah University buildings, healthcare facilities, public safety facilities, municipal buildings, airport facilities, utility equipment, signs, and business assets. Transportation and infrastructure impacts could affect I-15, SR-14, SR-56, SR-130/Main Street, Cross Hollow Road, Iron Springs Road, 4000 North, 6000 North, local arterials, Cedar City Regional Airport, Union Pacific rail connections, public works yards, emergency response routes, and parking areas. Impacts could include hazardous travel, vehicle crashes, property damage, business interruption, school or campus disruptions, airport delays, utility service interruptions, and increased insurance, repair, and public works response costs.
Enoch City	**Vulnerabilities:** The Enoch City is vulnerable to hail because residential neighborhoods, schools, parks, municipal buildings, vehicles, local businesses, utility infrastructure, construction sites, and future development areas are exposed to severe thunderstorms moving across Cedar Valley. Hail risk is elevated where homes, vehicles, school facilities, public buildings, power and communications infrastructure, and outdoor assets are concentrated along SR-130, Midvalley Road, local arterials, and developing neighborhoods. **Impacts:** Hail could damage roofs, siding, windows, vehicles, school buildings, municipal facilities, park structures, construction materials, utility equipment, signs, and outdoor public assets. Transportation and infrastructure impacts could include hazardous travel, reduced visibility, slick roads, vehicle damage, and potential crashes along SR-130, Midvalley Road, I-15 access routes, local arterials, school access routes, and emergency response routes. Damage could increase repair costs for residents, the city, schools, utilities, and businesses and could temporarily disrupt school operations, public works, emergency response, and community services.

Plan Participant	Vulnerabilities and Impacts
Town of Kanarraville (regional context)	**Vulnerabilities:** The Town of Kanarraville is vulnerable to hail because homes, local roads, vehicles, water facilities, utilities, trailhead and recreation assets, agricultural areas, outbuildings, fencing, livestock shelters, and visitors outdoors may be exposed to localized severe thunderstorms along the I-15 corridor and Kanarra Creek/canyon setting. The town's small road network, outdoor recreation activity, and limited local repair resources increase vulnerability where hail affects people, vehicles, and facilities with little warning. **Impacts:** Hail could damage roofs, windows, siding, vehicles, outbuildings, signs, utility equipment, trailhead facilities, fences, gardens, agricultural equipment, and livestock shelters. Impacts could include injuries to residents or visitors caught outdoors, hazardous driving and vehicle damage along I-15 access routes, frontage roads, local streets, trailhead roads, and emergency response routes, as well as localized power or communications disruptions. Hail damage could also disrupt recreation access, increase public works and repair costs, and affect residents, visitors, agricultural users, and emergency responders.
Town of Paragonah	**Vulnerabilities:** The Town of Paragonah is vulnerable to hail because homes, vehicles, public buildings, local roads, utility systems, agricultural fields, hay and forage production, irrigation equipment, fencing, livestock shelters, outbuildings, and farm machinery are exposed to localized severe thunderstorms in Parowan Valley. Rural residential and agricultural assets are particularly vulnerable because even smaller hail can damage crops and vegetation, while larger hail can damage roofs, vehicles, windows, and exposed equipment. **Impacts:** Hail could damage roofs, siding, windows, vehicles, farm equipment, irrigation components, hay, forage, gardens, fencing, livestock shelters, utility equipment, signs, and public facilities. Transportation and infrastructure impacts could include hazardous travel, slick road conditions, reduced visibility, and vehicle damage along local streets, agricultural access roads, SR-271/old highway connections, nearby I-15 access, and emergency response routes. Impacts could increase repair and insurance costs, disrupt agricultural operations, reduce crop or forage quality, and temporarily affect municipal services, public works, and emergency response.
Parowan City	**Vulnerabilities:** Parowan City is vulnerable to hail because homes, businesses, public buildings, schools, municipal facilities, vehicles, agricultural lands, irrigation infrastructure, utility systems, recreation access routes, and visitor travel corridors are exposed to severe thunderstorms moving through Parowan Valley and Parowan Canyon. Agricultural assets, municipal facilities, older roofs, vehicles, schools, and visitor-serving areas are vulnerable where hail damages structures, crops, equipment, and transportation assets with little warning. **Impacts:** Hail could damage roofs, windows, siding, vehicles, public buildings, schools, municipal facilities, irrigation equipment, hay and forage crops,

Plan Participant	Vulnerabilities and Impacts
	fencing, signs, utility equipment, and visitor-serving assets. Transportation impacts could include hazardous driving, vehicle damage, reduced visibility, and slick road conditions along I-15 access routes, SR-143, Parowan Canyon Road, local streets, bridges, culverts, and emergency response routes serving Parowan, Parowan Canyon, and Brian Head. Impacts could include increased repair costs, school or municipal service disruption, agricultural losses, visitor travel delays, and localized power or communications interruptions.

Landslide

Table 115 summarizes landslide vulnerabilities and potential impacts for Iron County participants.

Table 115: Landslide Vulnerability and Impact Assessment for Iron County

Plan Participant	Vulnerabilities and Impacts
Unincorporated Iron County	**Vulnerabilities:** Unincorporated Iron County contains canyon corridors, steep slopes, road cuts, public land access routes, drainage channels, utility corridors, communications sites, water facilities, irrigation infrastructure, reservoirs, bridges, culverts, and dispersed homes that may be exposed to landslides, rockfall, debris flows, or slope instability. Utah Geological Survey geologic-hazard mapping for portions of Iron County identifies landslide, rockfall, debris-flow, flooding, collapsible soil, shallow groundwater, liquefaction, and other geologic hazards in areas that include the Cedar City, Cedar City NW, Enoch, and Kanarraville quadrangles. Unincorporated areas are particularly vulnerable where development, county roads, state highways, utility lines, public land facilities, and emergency response routes cross steep terrain, canyon mouths, alluvial fans, unstable slopes, or areas affected by wildfire, intense rainfall, snowmelt, or seismic shaking. **Impacts:** Landslides or rockfall could damage homes, agricultural facilities, water and irrigation systems, utility corridors, communications infrastructure, roads, bridges, culverts, and public land access routes. Transportation impacts could include closures, debris deposition, road undermining, or slope failures along I-15, SR-14, SR-56, SR-130, SR-143, county-maintained roads, canyon roads, public land access roads, and emergency response routes. Documented landslide impacts in Iron County include the SR-14 landslide that buried and displaced a section of the highway and affected Coal Creek, demonstrating how slope failures can disrupt regional travel, utilities, drainage, emergency access, freight movement, and recovery operations.
Brian Head Town	**Vulnerabilities:** Brian Head Town is vulnerable to landslides, rockfall, debris flows, and slope instability because of its high-elevation mountain setting, steep slopes, resort development, lodging, town facilities, water and sewer infrastructure, electric and communications systems, ski-area infrastructure, and limited access. Slope instability can affect local roads, retaining areas, drainageways, stormwater facilities, utility lines, and developed areas where

Plan Participant	Vulnerabilities and Impacts
	steep terrain, snowmelt, intense rainfall, wildfire effects, or seismic shaking increase instability. The community's dependence on SR-143 and local mountain roads increases vulnerability if slope movement limits access for residents, visitors, public works, fire protection, emergency medical response, or evacuation. **Impacts:** Landslides or rockfall in Brian Head could damage lodging, homes, resort facilities, ski-area infrastructure, public buildings, water and wastewater systems, electric and communications equipment, culverts, drainage facilities, retaining structures, and local roads. Transportation impacts could include closures or restrictions on SR-143 and mountain access roads, isolating residents and visitors and delaying emergency response. Additional impacts could include utility outages, debris removal needs, interruption of resort operations, damage to public works infrastructure, slope stabilization costs, and economic losses to lodging, recreation, and visitor-serving businesses.
Cedar City	**Vulnerabilities:** Cedar City is vulnerable to landslides, rockfall, debris flows, and related geologic hazards because the city contains concentrated development, public facilities, schools, Southern Utah University, healthcare access, public safety facilities, municipal utilities, drainage systems, canyon-adjacent neighborhoods, transportation corridors, and industrial areas near the western side of Cedar Valley and the Coal Creek/SR-14 corridor. Utah Geological Survey mapping for the Cedar City area identifies landslide, rockfall, debris-flow, shallow groundwater, liquefaction, collapsible soil, and other geologic hazards. Development near steep slopes, drainage corridors, canyon mouths, road cuts, and utility corridors may be vulnerable where intense rainfall, snowmelt, wildfire, erosion, or seismic shaking triggers slope movement. **Impacts:** Landslides or rockfall affecting Cedar City could damage homes, businesses, schools, Southern Utah University facilities, healthcare facilities, public buildings, stormwater infrastructure, water and wastewater systems, electric and communications systems, bridges, culverts, and industrial facilities. Transportation impacts could include debris, closures, or slope damage along SR-14, I-15, SR-56, SR-130/Main Street, Cross Hollow Road, Iron Springs Road, 4000 North, 6000 North, local arterials, Union Pacific rail connections, Cedar City Regional Airport access, and emergency response routes. The documented SR-14 landslide east of Cedar City demonstrates that slope failures can interrupt regional connectivity, affect Coal Creek, require major repair work, and create substantial public safety, transportation, utility, and recovery impacts.
Enoch City	**Vulnerabilities:** The Enoch City is vulnerable to landslide-related impacts primarily where growth, roads, utilities, drainage systems, and public facilities intersect Cedar Valley geologic hazards and nearby slope or alluvial-fan settings. Utah Geological Survey mapping that includes the Enoch quadrangle identifies landslide, rockfall, debris-flow, shallow groundwater, liquefaction, collapsible soil, and other geologic hazards in the broader Cedar Valley area. Residential neighborhoods, schools, municipal facilities, water and wastewater

Plan Participant	Vulnerabilities and Impacts
	infrastructure, electric and communications systems, drainage improvements, SR-130, Midvalley Road, local arterials, and future transportation corridors may be vulnerable where slope movement, debris, or sediment affects access, utilities, or stormwater conveyance. **Impacts:** Landslides, debris flows, or slope instability affecting Enoch could damage roads, culverts, drainage facilities, water and wastewater lines, public buildings, schools, utility corridors, and developing neighborhoods. Transportation impacts may include closures, sediment deposition, or damage along SR-130, Midvalley Road, I-15 access routes, local arterials, school access routes, and emergency response corridors. Additional impacts could include delayed emergency response, disruption to municipal services, increased drainage and public works maintenance, utility outages, and higher costs for geotechnical evaluation, slope stabilization, road repair, and infrastructure protection as the community continues to grow.
Town of Kanarraville (regional context)	**Vulnerabilities:** The Town of Kanarraville is vulnerable to landslides, rockfall, debris flows, and slope instability because homes, local roads, water infrastructure, utilities, bridges, culverts, public facilities, trailhead and recreation access, and emergency response routes are located near Kanarra Creek, canyon terrain, steep slopes, and the I-15 corridor. Utah Geological Survey geologic-hazard mapping that includes the Kanarraville quadrangle identifies landslide, rockfall, debris-flow, and related geologic hazards. The town's small road network, canyon access, visitor use, and reliance on I-15 access increase vulnerability if slope failures or debris flows affect local crossings, water facilities, trailhead areas, or emergency routes. **Impacts:** Landslides, rockfall, or debris flows could damage homes, local roads, culverts, bridges, water and sewer infrastructure, electric and communications lines, trailhead facilities, canyon recreation access, and public works systems. Transportation impacts could include closure or damage to local streets, I-15 access routes, frontage roads, canyon access roads, trailhead roads, and emergency response routes. Potential consequences include temporary isolation, injuries to residents or visitors, delayed fire and emergency medical response, disruption of recreation access, debris and sediment removal, utility interruptions, and repair or stabilization costs for roads, slopes, drainageways, and public infrastructure.
Town of Paragonah	**Vulnerabilities:** The Town of Paragonah is less directly exposed to steep mountain terrain than canyon communities, but residential areas, agricultural lands, irrigation ditches, local roads, utilities, public facilities, and transportation links may still be affected by landslide-related sediment, debris movement, slope instability along nearby foothill or drainage areas, or failures affecting regional access routes. The community's location in Parowan Valley means vulnerability is tied to drainage channels, alluvial-fan areas, irrigation infrastructure, local streets, agricultural access roads, SR-271/old highway connections, nearby I-15 access, and utility crossings where debris or slope movement could affect service continuity and access.

Plan Participant	Vulnerabilities and Impacts
	Impacts: Landslide-related debris, sediment, or slope instability affecting Paragonah could damage local roads, culverts, irrigation ditches, agricultural access routes, utilities, public facilities, fences, and fields. Transportation impacts could include closures or restricted access along local streets, SR-271/old highway connections, agricultural roads, nearby I-15 access, and emergency response routes. Potential consequences include delayed emergency response, disruption to agricultural operations, utility outages, sediment removal needs, increased public works costs, and reduced access between Paragonah, Parowan Valley communities, and regional transportation corridors.
Parowan City	**Vulnerabilities:** Parowan City is vulnerable to landslides, rockfall, debris flows, and slope instability where homes, businesses, public facilities, schools, water and wastewater systems, irrigation infrastructure, utilities, bridges, culverts, agricultural lands, and visitor-serving routes intersect Parowan Canyon, Parowan Creek, foothill slopes, and transportation corridors serving Brian Head. The town's reliance on I-15 access, SR-143, Parowan Canyon Road, local streets, and canyon routes increases vulnerability if slope failures block roads, damage utilities, or disrupt emergency access. Steep slopes, canyon drainages, snowmelt, intense rainfall, wildfire effects, and seismic shaking may contribute to local slope instability and debris movement. **Impacts:** Landslides, rockfall, or debris flows affecting Parowan could damage homes, public buildings, schools, water and wastewater infrastructure, irrigation systems, electric and communications lines, roads, bridges, culverts, agricultural assets, and visitor-serving facilities. Transportation impacts could include closures or damage along SR-143, Parowan Canyon Road, I-15 access routes, local streets, and routes connecting Parowan with Brian Head and surrounding rural areas. Impacts could include temporary isolation, delayed emergency response, interruption of visitor travel, utility outages, sediment and debris cleanup, damage to agricultural operations, and substantial costs for slope stabilization, road repair, drainage repair, and infrastructure recovery.

Problem Soils

Table 116 summarizes problem-soil vulnerabilities and potential impacts for Iron County participants.

Table 116: Problem Soils Vulnerability and Impact Assessment for Iron County

Plan Participant	Vulnerabilities and Impacts
Unincorporated Iron County	**Vulnerabilities:** Unincorporated Iron County contains dispersed homes, agricultural buildings, public land infrastructure, irrigation systems, wells, septic systems, culverts, bridges, county roads, utility corridors, and development areas that may be exposed to problem soils and related geologic hazards. Utah Geological Survey problem-soil guidance identifies collapsible soils, expansive soil and rock, corrosive soil and rock, soluble soil and rock, land subsidence, earth fissures, shallow bedrock, shallow groundwater, piping and erosion, and wind-blown sand as hazards that can damage buildings, utilities, roads, dikes, underground utilities, and other infrastructure if not identified and mitigated. Cedar Valley-specific UGS studies identify mapped hazards including collapsible soil, expansive soil and rock, corrosive soil and rock, soluble soil and rock, shallow groundwater, liquefaction, earth fissures, and wind-blown sand in the Cedar City, Cedar City NW, Enoch, and Kanarraville quadrangles. Iron County's Water Use and Preservation Element also notes that historical groundwater overdraft has caused subsidence and fissures in Cedar Valley. **Impacts:** Problem soils could cause foundation settlement, slab cracking, pavement distress, utility corrosion, pipeline breaks, septic system problems, culvert or ditch deformation, erosion, road shoulder failure, and damage to agricultural and public works infrastructure. Critical infrastructure and transportation networks that may be affected include county-maintained roads, I-15 access routes, SR-14, SR-56, SR-130, SR-143, SR-271/old highway connections, bridges, culverts, irrigation canals and ditches, culinary water systems, wastewater and septic systems, wells, electric and communications corridors, and emergency response routes. In Cedar Valley, land subsidence and earth fissures associated with groundwater decline could further affect roads, lots, pipelines, canals, drainage systems, and future development areas if site-specific geotechnical and geologic-hazard investigations are not completed before construction.
Brian Head Town	**Vulnerabilities:** Brian Head Town is vulnerable to problem soils and rock conditions associated with its high-elevation mountain setting, steep slopes, shallow bedrock, engineered cuts and fills, road embankments, retaining areas, drainage systems, resort facilities, lodging, town facilities, water and wastewater systems, and utility corridors. While the Cedar Valley UGS problem-soils mapping focuses on the Cedar City, Cedar City NW, Enoch, and Kanarraville quadrangles, UGS statewide problem-soil guidance identifies hazards such as expansive soil and rock, corrosive soil and rock, shallow bedrock, soluble soil and rock, collapsible soils, piping and erosion, and slope-related soil/rock conditions as concerns for buildings, utilities, roads, and

Plan Participant	Vulnerabilities and Impacts
	other infrastructure. Brian Head's reliance on SR-143 and local mountain roads increases vulnerability where soil or rock conditions affect road bases, drainage, retaining structures, utility lines, or foundations. **Impacts:** Problem soils or shallow rock conditions could damage building foundations, road subgrades, retaining structures, culverts, drainage facilities, water and sewer lines, electric and communications infrastructure, resort facilities, parking areas, and public works assets. Transportation impacts could include pavement cracking, settlement, erosion, or maintenance needs on SR-143 and local mountain roads, which could affect access for residents, visitors, snow removal, fire response, emergency medical service, utility repair, and evacuation. Impacts could also include higher construction costs, recurring maintenance, geotechnical investigation requirements, utility breaks, localized drainage issues, and damage to lodging or resort infrastructure if soil and rock conditions are not adequately addressed during design and construction.
Cedar City	**Vulnerabilities:** Cedar City is vulnerable to problem soils because the city contains dense residential, commercial, institutional, industrial, and public infrastructure in Cedar Valley, where UGS studies have mapped geologic hazards including collapsible soil, expansive soil and rock, corrosive soil and rock, soluble soil and rock, shallow groundwater, liquefaction, earth fissures, and wind-blown sand. The UGS land subsidence and earth fissure investigation found that groundwater mining in Cedar Valley lowered the potentiometric surface by as much as 114 feet since 1939, caused permanent compaction of fine-grained aquifer sediments, affected approximately 100 square miles of the valley, and produced at least 8.3 miles of earth fissures. Cedar City's buildings, streets, water and wastewater systems, drainage facilities, Southern Utah University facilities, schools, healthcare facilities, industrial areas, Cedar City Regional Airport, and utility corridors may be vulnerable where development occurs on susceptible soils or near fissure, subsidence, shallow groundwater, or corrosive soil areas. **Impacts:** Problem soils could cause foundation settlement, slab and wall cracking, pavement distress, buckling or failure of sidewalks and curbs, water and sewer line breaks, storm drain deformation, utility corrosion, septic or drainage problems, and damage to industrial or public facilities. Critical infrastructure and transportation impacts could affect I-15, SR-14, SR-56, SR-130/Main Street, Cross Hollow Road, Iron Springs Road, 4000 North, 6000 North, local arterials, Union Pacific rail connections, Cedar City Regional Airport access, water wellfields, recharge areas, wastewater and stormwater systems, electric and communications corridors, schools, healthcare facilities, public safety facilities, and Southern Utah University. Long-term impacts could include higher maintenance costs, need for geotechnical investigations, development constraints, utility service interruptions, and deformation of roadways, pipelines, canals, or drainage systems where subsidence, fissures, collapsible soils, or expansive soils affect built infrastructure.

Plan Participant	Vulnerabilities and Impacts
Enoch City	**Vulnerabilities:** The Enoch City is specifically vulnerable to problem soils, land subsidence, and earth fissures in Cedar Valley. The Utah Geological Survey reported that Enoch City contacted UGS after streets, sidewalks, and curbs and gutters in a new subdivision were being damaged; UGS identified a 2.4-mile-long earth fissure formed in response to land subsidence caused by groundwater overdraft. The same UGS report notes that the fissure crossed undeveloped lots and damaged streets and sidewalks, with vertical displacement reversing the flow direction of a sewer line so that gravity drainage was no longer possible. Enoch's residential neighborhoods, roads, sidewalks, curbs, schools, municipal facilities, water and wastewater systems, storm drainage, electric and communications utilities, SR-130, Midvalley Road, I-15 access routes, and future growth areas may be vulnerable where development intersects fissures, collapsible soils, expansive soils, shallow groundwater, corrosive soils, or other mapped geologic hazards. **Impacts:** Problem soils in Enoch could damage foundations, pavements, sidewalks, curbs, gutters, sewer lines, water lines, storm drains, utility corridors, school facilities, public buildings, and developing subdivisions. Impacts could include utility service disruption, costly sewer or waterline reconstruction, road settlement, altered drainage, damage to private lots, reduced developable land, increased geotechnical investigation requirements, and higher maintenance costs. Critical transportation and access impacts could affect SR-130, Midvalley Road, local arterials, I-15 access routes, school access routes, public safety corridors, and future transportation improvements where fissures, settlement, or collapsible soils damage road bases, crossings, or underground utilities.
Town of Kanarraville (regional context)	**Vulnerabilities:** The Town of Kanarraville is included in the Cedar Valley geologic-hazard mapping area, which identifies where hazards such as collapsible soil, expansive soil and rock, corrosive soil and rock, soluble soil and rock, shallow groundwater, liquefaction, wind-blown sand, piping and erosion, and related geologic conditions may exist. Homes, local streets, bridges, culverts, water infrastructure, septic or wastewater systems, utilities, trailhead facilities, agricultural areas, and I-15 access routes may be vulnerable where development or infrastructure crosses susceptible soils, drainage corridors, canyon-mouth deposits, alluvial fans, or shallow groundwater areas. The town's small road network and reliance on I-15 access increase vulnerability if soil conditions damage pavement, utilities, or drainage structures. **Impacts:** Problem soils could cause foundation settlement, cracking of roads or sidewalks, culvert deformation, utility corrosion, water or sewer line damage, septic system problems, drainage failure, erosion, or damage to trailhead and recreation infrastructure. Transportation impacts could affect local streets, bridges, culverts, I-15 access routes, frontage roads, trailhead roads, canyon access roads, and emergency response routes. Potential consequences include higher public works costs, delayed emergency response, localized utility outages, damage to homes or public facilities,

Plan Participant	Vulnerabilities and Impacts
	drainage maintenance needs, and increased geotechnical requirements for future construction or infrastructure improvements.
Town of Paragonah	**Vulnerabilities:** The Town of Paragonah is vulnerable to problem soils where homes, agricultural buildings, irrigation ditches, water systems, private or municipal utilities, local roads, agricultural access routes, and public facilities are constructed on valley-floor or alluvial deposits in Parowan Valley. Although the most detailed UGS Cedar Valley mapping cited for this section focuses on Cedar City, Enoch, and Kanarraville, UGS statewide problem-soil guidance identifies collapsible soils, expansive soils, corrosive soils, soluble soils, piping and erosion, shallow bedrock, shallow groundwater, subsidence, and earth fissures as hazards that can affect buildings, utilities, roads, underground infrastructure, and agricultural infrastructure. Paragonah's agricultural setting increases vulnerability where irrigation, wetting and drying cycles, road embankments, ditches, or utility trenches interact with collapsible, expansive, corrosive, or erodible soils. **Impacts:** Problem soils could cause settlement of foundations, cracking of slabs and pavements, damage to irrigation ditches, corrosion of buried utilities, deformation of culverts, septic or drainage issues, and increased maintenance needs for local roads and agricultural infrastructure. Transportation and infrastructure impacts could affect local streets, agricultural access roads, SR-271/old highway connections, nearby I-15 access, bridges, culverts, irrigation systems, water lines, utility crossings, electric and communications corridors, and emergency response routes. Impacts could include higher repair costs for residents and public works, reduced reliability of water or irrigation systems, damage to fields or farm access, and additional geotechnical investigation needs for future development.
Parowan City	**Vulnerabilities:** Parowan City is vulnerable to problem soils where homes, businesses, public buildings, schools, water and wastewater systems, irrigation infrastructure, local streets, bridges, culverts, agricultural lands, and visitor-serving routes are located on valley-floor, alluvial, or canyon-related deposits near Parowan Valley and Parowan Canyon. UGS problem-soil guidance identifies collapsible soils, expansive soils, corrosive soils, soluble soils, piping and erosion, shallow bedrock, shallow groundwater, land subsidence, and earth fissures as hazards that can damage structures and infrastructure if not evaluated and mitigated. Parowan's reliance on I-15 access, SR-143, Parowan Canyon Road, local roads, irrigation systems, and utilities increases vulnerability where soil conditions affect foundations, road bases, buried utilities, drainage systems, or agricultural infrastructure. **Impacts:** Problem soils could cause building settlement, foundation and slab cracking, pavement distress, utility corrosion, water or sewer line damage, culvert deformation, irrigation ditch leakage or failure, erosion, and recurring maintenance problems. Critical infrastructure and transportation networks that may be affected include Parowan's water system, wastewater infrastructure, irrigation ditches, local streets, I-15 access routes, SR-143,

Plan Participant	Vulnerabilities and Impacts
	Parowan Canyon Road, bridges, culverts, electric and communications systems, school and municipal facilities, and emergency response routes serving Parowan, Parowan Canyon, and Brian Head. Impacts could include increased public works costs, delayed emergency access, utility outages, damage to agricultural operations, development constraints, and the need for site-specific geotechnical investigations before new construction or infrastructure improvements.

Radon Gas

Table 117 summarizes radon vulnerabilities and potential impacts for Iron County participants.

Table 117: Radon Gas Vulnerability and Impact Assessment for Iron County

Plan Participant	Vulnerabilities and Impacts
Unincorporated Iron County	**Vulnerabilities:** Unincorporated Iron County is vulnerable to radon because radon is an odorless, invisible radioactive gas that can enter homes and buildings through soil, foundation openings, cracks, crawl spaces, basements, slabs, utility penetrations, and other pathways. The EPA's Utah radon zone map classifies Iron County as Zone 2, indicating moderate radon potential with predicted average indoor screening levels between 2 and 4 pCi/L; EPA also states that zone maps should not be used to decide whether individual buildings need testing because all homes should be tested. Dispersed homes, manufactured housing, farm and ranch residences, public buildings, fire stations, community facilities, schools, childcare facilities, private wells or buildings with lower-level occupied areas, and employee work spaces may be vulnerable where testing has not been completed or where elevated levels have not been mitigated. **Impacts:** Radon does not typically damage transportation networks or aboveground critical infrastructure, but prolonged indoor exposure can increase lung cancer risk for residents, workers, students, visitors, and first responders who spend time in affected buildings. Impacts may include long-term public health risk, need for testing and mitigation in homes and public facilities, costs for sub-slab depressurization or other mitigation systems, and increased outreach needs for rural residents and property owners. Critical facilities that may require testing and mitigation include county buildings, emergency response facilities, schools, community buildings, public works facilities, and other regularly occupied structures, particularly basements, ground floors, crawl space buildings, and slab-on-grade buildings.

Plan Participant	Vulnerabilities and Impacts
Brian Head Town	**Vulnerabilities:** Brian Head Town is vulnerable to radon where homes, lodging, resort facilities, public buildings, employee housing, town facilities, and other occupied structures have lower-level rooms, crawl spaces, slab-on-grade foundations, or foundation openings that allow soil gas to enter. EPA and CDC guidance emphasize that radon can occur in any building, including new or old buildings and buildings with or without basements, and that the only way to know whether radon is elevated is to test. Seasonal lodging, vacation rentals, public-facing facilities, and employee work spaces may be vulnerable if testing is not conducted or mitigation is not maintained. **Impacts:** Radon gas would not be expected to directly damage SR-143, local roads, resort utilities, or physical infrastructure, but elevated indoor levels could create long-term health risk for residents, workers, resort employees, visitors, and public employees who spend extended time in affected buildings. Impacts could include testing and mitigation costs for homes, lodging, town facilities, resort facilities, and employee housing; need for public education for short-term rental owners and second-home owners; and potential disruption if occupied facilities require mitigation installation, post-mitigation retesting, or ventilation improvements.
Cedar City	**Vulnerabilities:** Cedar City is vulnerable to radon because it contains Iron County's largest concentration of homes, apartments, schools, childcare facilities, Southern Utah University facilities, healthcare facilities, municipal buildings, public safety facilities, commercial buildings, and workplaces. EPA's Utah radon zone mapping classifies Iron County as Zone 2, and Utah DEQ states that radon is the second leading cause of lung cancer and that one in three Utah homes has elevated radon levels. Buildings with basements, crawl spaces, slab-on-grade foundations, lower-level classrooms, offices, dormitories, healthcare spaces, or occupied ground-floor areas may be vulnerable if radon testing is incomplete or mitigation systems are absent, ineffective, or not maintained. **Impacts:** Elevated radon in Cedar City could create long-term health risk for residents, students, faculty, healthcare workers, public employees, first responders, and workers in regularly occupied buildings. Impacts could include testing, mitigation, retesting, and maintenance costs for homes, rental housing, schools, Southern Utah University buildings, healthcare facilities, municipal facilities, public safety buildings, and commercial properties. While radon does not directly damage I-15, SR-14, SR-56, SR-130/Main Street, Cedar City Regional Airport, Union Pacific rail connections, utilities, or roads, it can affect the safe long-term occupancy and facility management of critical buildings that support education, healthcare, public safety, emergency management, and municipal operations.

Plan Participant	Vulnerabilities and Impacts
Enoch City	**Vulnerabilities:** The Enoch City is vulnerable to radon because residential neighborhoods, schools, public buildings, municipal facilities, and future development areas include occupied structures that may allow soil gas entry through foundations, slabs, crawl spaces, basements, cracks, and utility penetrations. EPA and CDC guidance note that radon can build up in homes and buildings regardless of age, foundation type, or basement presence, and that testing is the only way to determine radon levels. Enoch's continued residential growth increases the number of buildings that may require radon testing, radon-resistant new construction consideration, and mitigation where elevated levels are identified. **Impacts:** Elevated radon could create long-term health risk for residents, students, teachers, municipal staff, public safety personnel, and workers in affected buildings. Impacts may include testing and mitigation costs for homes, schools, public buildings, and municipal facilities; need for homeowner and builder outreach; and ongoing maintenance of mitigation systems. Radon would not directly damage SR-130, Midvalley Road, I-15 access routes, local arterials, utilities, or stormwater systems, but it may affect the long-term safe use and management of schools, public buildings, and housing if elevated indoor levels are not identified and reduced.
Town of Kanarraville (regional context)	**Vulnerabilities:** The Town of Kanarraville is vulnerable to radon because homes, public facilities, local service buildings, lodging or visitor-serving structures, and other occupied buildings may have crawl spaces, basements, slabs, or foundation openings that allow radon to enter from underlying soil and rock. EPA's Utah radon zone map places Iron County in Zone 2, but EPA guidance emphasizes that individual building levels vary and that all homes should be tested regardless of zone. Rural properties, older buildings, homes with lower-level occupied spaces, and community facilities may be vulnerable where testing has not occurred or mitigation is not installed. **Impacts:** Radon gas would not directly affect Kanarraville's roads, I-15 access, Kanarra Creek crossings, utilities, or trailhead infrastructure, but elevated indoor levels could increase long-term lung cancer risk for residents, workers, visitors staying in occupied buildings, and public employees. Impacts could include testing and mitigation costs for homes, town facilities, community buildings, and visitor-serving properties; outreach needs for property owners and landlords; and minor facility disruptions during mitigation installation or retesting. Public education is important because radon cannot be seen, smelled, or tasted and elevated levels are only identified through testing.
Town of Paragonah	**Vulnerabilities:** The Town of Paragonah is vulnerable to radon because homes, public buildings, community facilities, agricultural residences, and occupied work spaces may allow soil gas to enter through foundations, slabs, crawl spaces, basements, cracks, sump openings, or utility penetrations. EPA and CDC guidance state that radon can enter any home or building and that testing is the only way to know whether levels are elevated. Rural homes, older structures, homes with lower-level occupied space, and community

Plan Participant	Vulnerabilities and Impacts
	facilities may be vulnerable if testing and mitigation have not been completed. **Impacts:** Radon would not directly damage Paragonah's roads, irrigation systems, I-15 access, SR-271/old highway connections, utilities, or agricultural infrastructure, but elevated indoor levels could create long-term health risk for residents, public employees, agricultural workers, and occupants of affected homes or public buildings. Impacts may include testing, mitigation, retesting, and system-maintenance costs for homes and public facilities; outreach needs for rural property owners; and potential temporary disruption to occupied buildings during mitigation installation. Because radon has no immediate warning signs, missed testing could allow exposure to continue over many years.
Parowan City	**Vulnerabilities:** Parowan City is vulnerable to radon because homes, schools, public buildings, municipal facilities, businesses, visitor-serving facilities, and occupied work spaces may have lower-level or ground-contact areas where radon can accumulate. EPA's Utah radon zone map classifies Iron County as Zone 2, and EPA guidance recommends testing all homes and reducing indoor radon where levels are at or above 4 pCi/L, with consideration of mitigation between 2 and 4 pCi/L. Buildings with basements, crawl spaces, slabs, foundation cracks, or utility penetrations may be vulnerable if testing is incomplete or mitigation systems are not installed or maintained. **Impacts:** Radon gas would not directly damage I-15 access routes, SR-143, Parowan Canyon Road, local streets, bridges, culverts, water systems, wastewater systems, utilities, or irrigation infrastructure, but elevated indoor radon could affect the long-term health of residents, students, workers, municipal employees, and visitors who spend time in affected buildings. Impacts could include testing and mitigation costs for homes, schools, municipal facilities, businesses, and visitor-serving structures; outreach needs for homeowners, landlords, and builders; and ongoing operation and maintenance of mitigation systems to support safe long-term occupancy of public and private buildings.

Thunderstorms and Lightning

Table 118 summarizes thunderstorms and lightning vulnerabilities and potential impacts for Iron County participants.

Table 118: Thunderstorms and Lightning Vulnerability and Impact Assessment for Iron County

Plan Participant	Vulnerabilities and Impacts
Unincorporated Iron County	**Vulnerabilities:** Unincorporated Iron County is vulnerable to thunderstorms and lightning because residents, agricultural producers, outdoor workers, livestock, visitors, public land users, campgrounds, trailheads, utility corridors, communications sites, water facilities, road crews, and emergency responders may be exposed to cloud-to-ground lightning, severe thunderstorm winds, heavy rain, hail, and rapid changes in travel conditions. National Weather Service guidance defines severe thunderstorms as storms capable of producing hail one inch or larger or wind gusts over 58 mph, and notes that thunderstorms may also produce dangerous lightning, tornadoes, and heavy rain that can cause flash flooding. Lightning is also a wildfire ignition source, and recent Iron County reporting documented lightning-caused fires near Cedar City on BLM and nearby private lands. **Impacts:** Thunderstorms and lightning could cause injuries or fatalities to people outdoors, ignite wildfires, damage electric and communications infrastructure, disrupt water and public safety systems, damage roofs, signs, vehicles, outbuildings, livestock facilities, and agricultural assets, and create hazardous travel conditions from wind, lightning, hail, blowing dust, and heavy rain. Critical infrastructure and transportation networks that may be affected include I-15, SR-14, SR-56, SR-130, SR-143, SR-271/old highway connections, county-maintained roads, public land access roads, agricultural access routes, bridges, culverts, electric distribution lines, communications towers, dispatch and emergency response systems, fire stations, water facilities, and emergency response corridors. Cascading impacts may include power outages, delayed emergency response, road closures, wildfire response needs, and disruption to residents, livestock operations, recreation, and travel.
Brian Head Town	**Vulnerabilities:** Brian Head Town is vulnerable to thunderstorms and lightning because residents, visitors, resort employees, outdoor recreation users, construction workers, public works staff, and emergency responders may be exposed in a high-elevation mountain setting where storms can develop quickly. Lodging, resort facilities, ski-area equipment, communications systems, electric infrastructure, water and wastewater systems, trailheads, signage, and local roads are vulnerable to lightning, severe wind, hail, and stormwater runoff. Brian Head's limited access via SR-143 and local mountain roads increases vulnerability if lightning, downed trees, power outages, wildfire starts, or debris affect access and response. **Impacts:** Thunderstorms and lightning could injure visitors or workers outdoors, damage resort and lodging facilities, interrupt power and communications, affect water and wastewater systems, damage signs or

Plan Participant	Vulnerabilities and Impacts
	public works equipment, and ignite wildfires in surrounding forested lands. Transportation and access impacts could include hazardous conditions, debris, vehicle crashes, or temporary closures along SR-143, local mountain roads, trailhead roads, and emergency response routes. Impacts could include interruption of resort operations, evacuation or sheltering needs for visitors, delayed fire and emergency medical response, utility restoration costs, and increased wildfire suppression demands.
Cedar City	**Vulnerabilities:** Cedar City is vulnerable to thunderstorms and lightning because it contains Iron County's largest concentration of residents, businesses, schools, Southern Utah University, healthcare facilities, public safety facilities, municipal buildings, utilities, transportation systems, industrial areas, airport facilities, and visitor-serving uses. Severe thunderstorms can damage roofs, siding, trees, mobile homes, and outbuildings and interrupt utilities and travel along Interstate 15 and State Route 56. Lightning may ignite structure or wildland fires. **Impacts:** Thunderstorms and lightning could damage homes, schools, Southern Utah University facilities, healthcare facilities, public safety buildings, municipal facilities, airport facilities, utility equipment, communications systems, traffic signals, signs, trees, vehicles, and roofs. Critical infrastructure and transportation networks that may be affected include I-15, SR-14, SR-56, SR-130/Main Street, Cross Hollow Road, Iron Springs Road, 4000 North, 6000 North, Cedar City Regional Airport, Union Pacific rail connections, industrial corridors, electric distribution systems, communications systems, water and wastewater facilities, public safety facilities, and emergency response routes. Potential consequences include power outages, communications disruption, wildfire starts, hazardous travel, airport delays, business interruption, school or campus disruptions, EMS call increases, and debris removal or utility restoration needs.
Enoch City	**Vulnerabilities:** The Enoch City is vulnerable to thunderstorms and lightning because residential neighborhoods, schools, parks, public buildings, utilities, developing subdivisions, construction sites, and transportation corridors are located in Cedar Valley where severe storms can produce damaging wind, hail, lightning, and heavy rain. Damaging wind can affect roofs, siding, trees, mobile homes, and outbuildings. Enoch's growth along SR-130, Midvalley Road, local arterials, and I-15 access routes increases exposure of homes, utilities, schools, and municipal services to storm-related outages and access disruptions. **Impacts:** Thunderstorms and lightning could damage homes, schools, public buildings, park facilities, utility equipment, vehicles, construction materials, signs, trees, and communications infrastructure. Transportation impacts could include hazardous travel, reduced visibility, debris, downed power lines, traffic disruption, and vehicle crashes along SR-130, Midvalley Road, I-15 access routes, school access routes, local arterials, and emergency response corridors. Additional impacts could include localized power outages, communications interruptions, delayed emergency response, school or

Plan Participant	Vulnerabilities and Impacts
	municipal service disruption, stormwater and drainage issues, and increased public works or utility repair costs.
Town of Kanarraville (regional context)	**Vulnerabilities:** The Town of Kanarraville is vulnerable to thunderstorms and lightning because homes, public buildings, local roads, bridges, culverts, water infrastructure, utilities, trailhead areas, visitors, hikers, agricultural uses, and emergency responders may be exposed to lightning, damaging wind, hail, and heavy rain near Kanarra Creek, canyon terrain, and the I-15 corridor. **Impacts:** Thunderstorms and lightning could injure residents or visitors outdoors, damage homes, roofs, signs, vehicles, trailhead facilities, water system components, utilities, and communications infrastructure, and produce localized debris, flooding, or fire starts. Transportation impacts could affect I-15 access routes, frontage roads, local streets, trailhead roads, Kanarra Creek access, bridges, culverts, and emergency response routes. Impacts could include temporary isolation, delayed fire and emergency medical response, disruption to recreation access, localized power or communications outages, debris cleanup, and increased public works and utility repair needs.
Town of Paragonah	**Vulnerabilities:** The Town of Paragonah is vulnerable to thunderstorms and lightning because homes, public buildings, local roads, utility systems, agricultural fields, livestock facilities, irrigation equipment, outbuildings, vehicles, and emergency response routes are exposed to severe storms moving through Parowan Valley. Rural residents, agricultural workers, livestock, and public works personnel may be exposed outdoors where shelter is limited. Severe thunderstorm winds and lightning can affect electric and communications systems, roofs, signs, trees, irrigation infrastructure, farm equipment, and local transportation routes. **Impacts:** Thunderstorms and lightning could damage roofs, windows, vehicles, outbuildings, irrigation equipment, livestock shelters, utility equipment, communications lines, signs, trees, and agricultural assets. Transportation impacts could include hazardous travel, debris, reduced visibility, slick roads, downed power lines, and access disruption along local streets, agricultural access roads, SR-271/old highway connections, nearby I-15 access, and emergency response routes. Additional impacts could include localized power outages, communications disruption, crop or livestock impacts, public works repair needs, delayed emergency response, and increased costs for debris removal, utility restoration, and agricultural recovery.
Parowan City	**Vulnerabilities:** Parowan City is vulnerable to thunderstorms and lightning because homes, businesses, schools, public buildings, municipal facilities, agricultural lands, irrigation systems, utilities, vehicles, recreation areas, and visitor travel routes are exposed to severe storms moving through Parowan Valley and Parowan Canyon. Lightning, damaging winds, hail, and heavy rain can affect public facilities, utility systems, emergency response routes, agricultural operations, and travel between Parowan, Brian Head, and surrounding rural areas. Outdoor workers, residents, students, visitors, and

Plan Participant	Vulnerabilities and Impacts
	travelers are vulnerable when storms develop quickly and shelter or communications are limited. **Impacts:** Thunderstorms and lightning could damage homes, schools, public buildings, roofs, vehicles, signs, trees, irrigation equipment, utility systems, communications infrastructure, bridges, culverts, and visitor-serving facilities. Critical infrastructure and transportation networks that may be affected include I-15 access routes, SR-143, Parowan Canyon Road, local streets, agricultural access roads, electric and communications systems, water and wastewater facilities, schools, municipal facilities, and emergency response routes serving Parowan, Parowan Canyon, and Brian Head. Impacts could include power outages, communications disruption, lightning-caused wildfire starts, hazardous travel, road debris, delayed emergency response, interruption of visitor travel, agricultural damage, and repair or debris removal costs.

Tornadoes

Table 119 summarizes tornado vulnerabilities and potential impacts for Iron County participants.

Table 119: Tornadoes Vulnerability and Impact Assessment for Iron County

Plan Participant	Vulnerabilities and Impacts
Unincorporated Iron County	**Vulnerabilities:** Unincorporated Iron County is vulnerable to tornadoes and tornado-producing severe thunderstorms despite the county's relatively low tornado frequency. NOAA's Storm Events Database includes an EF0 landspout tornado west of Interstate 15 between Cedar City and Enoch on April 18, 2025, and the database documents tornadoes, thunderstorm wind, hail, and other severe weather events by county. Dispersed residences, manufactured homes, agricultural buildings, barns, livestock facilities, public land facilities, campgrounds, trailheads, utility corridors, communications sites, road crews, travelers, and emergency responders may be exposed where shelter options are limited and warning times are short. FEMA and NWS guidance emphasize that mitigation planning should identify vulnerable assets and that mobile and manufactured homes, vehicles, and outdoor locations are unsafe during tornado warnings. **Impacts:** Tornadoes could damage or destroy homes, manufactured housing, barns, outbuildings, agricultural equipment, vehicles, power poles, communications equipment, water facilities, signs, fencing, trees, and public facilities. Critical infrastructure and transportation networks that may be affected include I-15, SR-14, SR-56, SR-130, SR-143, SR-271/old highway connections, county-maintained roads, agricultural access roads, public land access roads, bridges, culverts, electric distribution lines, communications towers, emergency response routes, and dispatch or public safety communications systems. Impacts may include injuries or fatalities, debris-

Plan Participant	Vulnerabilities and Impacts
	blocked roads, power and communications outages, damage to water or wastewater utilities, delayed emergency response, livestock losses, disruption to recreation and travel, and increased debris removal, sheltering, and recovery costs.
Brian Head Town	**Vulnerabilities:** Brian Head Town is vulnerable to tornadoes and severe rotating storms where residents, visitors, resort employees, lodging guests, outdoor recreation users, construction workers, public works staff, and emergency responders may be exposed with limited nearby shelter. Although tornado occurrence is uncommon in Iron County, tornadoes can occur in all states and may develop from severe thunderstorms. Brian Head's high-elevation resort setting, seasonal visitor population, lodging, resort facilities, ski-area infrastructure, water and wastewater systems, electric and communications infrastructure, and limited access via SR-143 increase vulnerability if tornado or severe wind damage affects local roads, utilities, or occupied buildings. **Impacts:** A tornado or tornado-producing severe storm could damage roofs, windows, lodging facilities, resort buildings, public facilities, vehicles, signs, lift or operations-support structures, utility lines, communications equipment, water and wastewater assets, trees, and local roads. Transportation and access impacts could include debris, downed trees, damaged utilities, vehicle crashes, or temporary closures on SR-143, local mountain roads, trailhead roads, and emergency response routes. Impacts could include injuries to people outdoors or in vehicles, temporary isolation of residents and visitors, interrupted resort operations, power and communications outages, delayed fire and emergency medical response, and increased debris removal and repair costs.
Cedar City	**Vulnerabilities:** Cedar City is vulnerable to tornadoes and tornado-producing severe thunderstorms because it contains Iron County's largest concentration of residents, homes, apartments, schools, Southern Utah University, healthcare facilities, public safety facilities, municipal buildings, utility systems, airport facilities, industrial areas, businesses, and transportation infrastructure. The National Weather Service Enhanced Fujita Scale identifies damage indicators that include residences, schools, institutional buildings, warehouses, transmission towers, free-standing poles, trees, and other structures, all of which are represented in Cedar City's built environment. Residents in manufactured housing, people in vehicles, students, visitors, outdoor workers, and people in large-span or nonreinforced buildings may be more vulnerable if a tornado warning occurs with limited time to shelter.

Plan Participant	Vulnerabilities and Impacts
	Impacts: A tornado affecting Cedar City could damage homes, apartments, schools, Southern Utah University facilities, healthcare facilities, public safety buildings, municipal buildings, warehouses, industrial structures, service stations, signs, vehicles, trees, power poles, communications equipment, and water or wastewater facilities. Critical infrastructure and transportation networks that may be affected include I-15, SR-14, SR-56, SR-130/Main Street, Cross Hollow Road, Iron Springs Road, 4000 North, 6000 North, Cedar City Regional Airport, Union Pacific rail connections, public safety facilities, electric distribution systems, communications systems, water and wastewater systems, public works yards, and emergency response routes. Impacts could include injuries or fatalities, power and communications outages, debris-blocked roads, airport delays or facility damage, school or campus disruptions, healthcare access disruption, business interruption, and extensive debris removal and repair costs.
Enoch City	**Vulnerabilities:** The Enoch City is vulnerable to tornadoes and tornado-producing severe thunderstorms because residential neighborhoods, schools, parks, municipal buildings, utilities, construction sites, developing subdivisions, and transportation corridors are located in Cedar Valley where severe storms can produce damaging winds, hail, lightning, and isolated tornadoes. Manufactured homes, vehicles, outdoor recreation areas, school facilities, public buildings, utility systems, and developing areas along SR-130, Midvalley Road, local arterials, and I-15 access routes are vulnerable where warning time is limited and sturdy shelter may not be immediately available. **Impacts:** A tornado affecting Enoch could damage homes, schools, public buildings, park facilities, roofs, windows, vehicles, construction materials, utility equipment, communications infrastructure, signs, trees, and developing subdivisions. Transportation and infrastructure impacts could include debris, downed power lines, traffic disruption, damaged signals or signs, and hazardous travel along SR-130, Midvalley Road, I-15 access routes, school access routes, local arterials, and emergency response corridors. Additional impacts could include injuries, power outages, communications interruptions, delayed emergency response, school or municipal service disruption, damage to water or wastewater infrastructure, and increased public works, debris removal, and utility restoration costs.
Town of Kanarraville (regional context)	**Vulnerabilities:** The Town of Kanarraville is vulnerable to tornadoes and tornado-producing severe thunderstorms because homes, public buildings, local roads, bridges, culverts, water infrastructure, utilities, trailhead areas, visitors, hikers, agricultural uses, and emergency response routes are located near the I-15 corridor and canyon terrain. Residents in manufactured or less wind-resistant structures, people in vehicles, hikers, trail users, outdoor workers, and visitors may be especially vulnerable because NWS guidance indicates that mobile homes, vehicles, and outdoor locations are unsafe during tornado warnings. The town's small road network and reliance on I-15 access increase vulnerability if debris, downed utilities, or road damage limit evacuation or emergency response.

Plan Participant	Vulnerabilities and Impacts
	Impacts: A tornado affecting Kanarraville could damage homes, roofs, windows, outbuildings, vehicles, signs, trailhead facilities, water system components, electric and communications lines, trees, fencing, and agricultural assets. Transportation impacts could affect I-15 access routes, frontage roads, local streets, trailhead roads, Kanarra Creek access, bridges, culverts, and emergency response routes. Impacts could include injuries to residents or visitors, temporary isolation, delayed fire and emergency medical response, localized utility outages, disruption to recreation access, debris cleanup, and increased public works and repair costs.
Town of Paragonah	**Vulnerabilities:** The Town of Paragonah is vulnerable to tornadoes and tornado-producing severe thunderstorms because homes, public buildings, local roads, utility systems, agricultural fields, livestock facilities, irrigation equipment, outbuildings, vehicles, and emergency response routes are exposed in Parowan Valley. Rural residents, agricultural workers, livestock operators, travelers, and public works personnel may be exposed outdoors where sturdy shelter is limited. Manufactured homes, barns, outbuildings, vehicles, power poles, communications lines, and agricultural structures are particularly vulnerable to tornado winds and windborne debris. **Impacts:** A tornado affecting Paragonah could damage homes, roofs, windows, vehicles, outbuildings, barns, irrigation equipment, livestock shelters, utility equipment, communications lines, signs, trees, fencing, and agricultural assets. Transportation impacts could include debris, reduced visibility, downed power lines, damaged signs, and access disruption along local streets, agricultural access roads, SR-271/old highway connections, nearby I-15 access, and emergency response routes. Additional impacts could include injuries, localized power and communications outages, crop or livestock impacts, public works repair needs, delayed emergency response, and increased costs for debris removal, utility restoration, and agricultural recovery.
Parowan City	**Vulnerabilities:** Parowan City is vulnerable to tornadoes and tornado-producing severe thunderstorms because homes, businesses, schools, public buildings, municipal facilities, agricultural lands, irrigation systems, utility corridors, vehicles, recreation areas, and visitor travel routes are exposed in Parowan Valley and along routes to Parowan Canyon and Brian Head. Residents, students, outdoor workers, travelers, agricultural operators, and visitors may be vulnerable if a tornado warning occurs with limited time to reach shelter. Manufactured homes, older buildings, barns, schools, municipal buildings, utility infrastructure, and vehicles are vulnerable to tornado winds, windborne debris, and associated severe thunderstorm hazards.

Plan Participant	Vulnerabilities and Impacts
	Impacts: A tornado affecting Parowan could damage homes, businesses, schools, public buildings, roofs, vehicles, signs, trees, irrigation equipment, utility systems, communications infrastructure, bridges, culverts, agricultural buildings, and visitor-serving facilities. Critical infrastructure and transportation networks that may be affected include I-15 access routes, SR-143, Parowan Canyon Road, local streets, agricultural access roads, electric and communications systems, water and wastewater facilities, schools, municipal facilities, and emergency response routes serving Parowan, Parowan Canyon, and Brian Head. Impacts could include injuries or fatalities, power outages, communications disruption, debris-blocked roads, delayed emergency response, interruption of visitor travel, agricultural damage, school or municipal service disruption, and repair or debris removal costs.

Wildfire

Table 120 summarizes wildfire vulnerabilities and potential impacts for Iron County participants.

Table 120: Wildfire Vulnerability and Impact Assessment for Iron County

Plan Participant	Vulnerabilities and Impacts
Unincorporated Iron County	**Vulnerabilities:** Unincorporated Iron County is vulnerable to wildfire where dispersed homes, agricultural buildings, livestock facilities, public lands, recreation areas, campgrounds, trailheads, utility corridors, communications sites, water facilities, fire response access roads, and rural transportation routes intersect wildland vegetation and dry fuels. Utah Forestry, Fire and State Lands identifies the Utah Wildfire Risk Assessment Portal as the state mechanism for deploying wildfire risk information and supporting mitigation and prevention efforts, and statewide WUI mapping identifies high-risk areas where structures and infrastructure meet or intermingle with undeveloped wildland vegetation. Unincorporated areas are particularly vulnerable where drought, wind, lightning, grass, sagebrush, pinyon-juniper, forested terrain, limited access, and long response distances increase fire spread potential and complicate evacuation or suppression. **Impacts:** Wildfire could destroy homes, barns, fences, livestock facilities, public land infrastructure, communications sites, electric distribution infrastructure, water facilities, recreation assets, and agricultural resources. Critical infrastructure and transportation networks that may be affected include I-15, SR-14, SR-56, SR-130, SR-143, SR-271/old highway connections, county-maintained roads, public land access roads, agricultural access roads, bridges, culverts, electric and communications corridors, water systems, fire stations, dispatch and emergency communications, and evacuation or mutual-aid routes. Impacts could include injuries or fatalities, evacuations, structure loss, livestock losses, power and communications outages, road closures, smoke impacts, watershed and drainage damage, post-fire flooding

Plan Participant	Vulnerabilities and Impacts
	or debris flows, emergency response delays, and long-term recovery and debris removal costs.
Brian Head Town	**Vulnerabilities:** Brian Head Town is highly vulnerable to wildfire because of its high-elevation forested setting, steep slopes, resort development, lodging, vacation homes, public facilities, ski-area infrastructure, utilities, limited access, and surrounding public lands. Brian Head's Community Wildfire Preparedness Plan states that the 2017 Brian Head Fire showed the community is at risk for wildfire and identifies wildfire risks, mitigation tactics, stakeholders, and solutions to reduce wildfire risk. The Town notes that Brian Head Public Safety partners with the Utah Division of Forestry, Dixie National Forest, and Cedar Breaks National Monument to reduce fire risk on surrounding public lands and provides property wildfire assessments to support defensible space and Firewise efforts. **Impacts:** Wildfire in Brian Head could damage or destroy homes, lodging, resort facilities, ski-area infrastructure, public buildings, water and wastewater systems, electric and communications infrastructure, road signs, trailheads, and forested recreation assets. Transportation impacts could include closure or restriction of SR-143 and local mountain roads, limiting evacuation, fire response, EMS access, utility repair, snow-removal operations, and visitor movement. Impacts could include evacuation of residents and visitors, loss of tourism revenue, smoke exposure, power and communications outages, interruption of resort operations, structure loss, post-fire flooding or debris flows on steep slopes, and substantial costs for suppression, debris removal, slope stabilization, utility repair, and fuels mitigation.
Cedar City	**Vulnerabilities:** Cedar City is vulnerable to wildfire because it contains the county's largest concentration of homes, businesses, schools, Southern Utah University, healthcare facilities, public safety facilities, municipal buildings, utilities, airport facilities, industrial areas, transportation corridors, and WUI-adjacent neighborhoods near open lands, canyon areas, grass, brush, and pinyon-juniper fuels. Utah wildfire risk resources identify WUI exposure as a statewide concern, and local reporting has documented lightning-caused wildfires outside Cedar City in the Comstock Road and Desert Mound areas, with BLM land, nearby private land, limited access, aircraft response, and multiple lightning-caused ignitions. Cedar City is also dependent on regional transportation, utilities, emergency communications, and water systems that may be exposed to fire, smoke, power disruption, or access restrictions. **Impacts:** Wildfire affecting Cedar City could damage homes, businesses, schools, Southern Utah University facilities, healthcare facilities, public safety buildings, municipal facilities, industrial structures, utility equipment, communications infrastructure, traffic signals, water and wastewater systems, airport facilities, and recreation assets. Critical infrastructure and transportation networks that may be affected include I-15, SR-14, SR-56, SR-130/Main Street, Cross Hollow Road, Iron Springs Road, 4000 North, 6000 North, Cedar City Regional Airport, Union Pacific rail connections, industrial corridors, electric distribution systems, communications systems, water and

Plan Participant	Vulnerabilities and Impacts
	wastewater facilities, public safety facilities, and evacuation routes. Impacts could include evacuations, injuries, structure loss, smoke impacts, power and communications outages, airport delays, business interruption, school or campus disruption, healthcare access impacts, road closures, post-fire flooding or debris flows, and major suppression and recovery costs.
Enoch City	**Vulnerabilities:** The Enoch City is vulnerable to wildfire where residential growth, schools, municipal facilities, parks, utilities, open lands, grass and brush fuels, and transportation corridors meet or border wildland vegetation in Cedar Valley. Utah WUI guidance defines the wildland-urban interface as the transition zone where structures and human development meet or intermingle with undeveloped wildland or vegetative fuels, and state high-risk WUI mapping is intended to identify structures and infrastructure most susceptible to wildfire impacts. Enoch's continued growth along SR-130, Midvalley Road, local arterials, future transportation corridors, and I-15 access routes increases the number of homes, schools, utilities, and public facilities that may require defensible space, evacuation planning, and fire-adapted development practices. **Impacts:** Wildfire affecting Enoch could damage homes, schools, public buildings, parks, water infrastructure, wastewater systems, electric and communications infrastructure, signs, fences, and open-space areas. Transportation and access impacts could include road closures, smoke, reduced visibility, debris, or utility-related hazards along SR-130, Midvalley Road, local arterials, I-15 access routes, school access routes, and emergency response corridors. Additional impacts could include evacuations, delayed emergency response, power and communications outages, increased water demand for firefighting, disruption to schools and municipal services, damage to developing subdivisions, post-fire drainage or erosion problems, and increased public works and recovery costs.
Town of Kanarraville (regional context)	**Vulnerabilities:** The Town of Kanarraville is vulnerable to wildfire because homes, local roads, water infrastructure, utilities, bridges, culverts, trailhead areas, visitors, recreation users, agricultural uses, and emergency response routes are located near Kanarra Creek, canyon terrain, open lands, grass, brush, and WUI fuels along the I-15 corridor. The Utah Wildfire Risk Assessment Portal and high-risk WUI mapping are intended to support local governments, property owners, fire departments, and planners in identifying wildfire risk and prioritizing mitigation. Kanarraville's small road network, canyon access, trail use, and reliance on I-15 access increase vulnerability if wildfire, smoke, or suppression activity affects local streets, trailheads, water supply, utilities, or evacuation routes.

Plan Participant	Vulnerabilities and Impacts
	Impacts: Wildfire could damage homes, outbuildings, water system components, electric and communications lines, trailhead facilities, signs, fences, agricultural assets, bridges, culverts, and canyon recreation access. Transportation impacts could affect I-15 access routes, frontage roads, local streets, trailhead roads, Kanarra Creek access, bridges, culverts, and emergency response routes. Impacts could include evacuations, smoke exposure, temporary isolation, delayed fire and emergency medical response, disruption to recreation access, power or communications outages, increased firefighting water demand, post-fire flooding or debris flows from burned slopes, and costs for suppression, debris removal, utility repair, and restoration of public facilities.
Town of Paragonah	**Vulnerabilities:** The Town of Paragonah is vulnerable to wildfire where homes, public buildings, local roads, utility systems, agricultural fields, livestock facilities, irrigation equipment, outbuildings, fences, grasslands, and nearby foothill or open lands are exposed to dry fuels, wind, drought, and lightning. Rural residents, agricultural workers, livestock operators, and public works personnel may be exposed where shelter, firefighting water, redundant access, and rapid response resources are limited. Utah wildfire risk and WUI resources identify development near wildland vegetation, drought, hazardous fuels, and structure exposure as key concerns for wildfire mitigation and preparedness. **Impacts:** Wildfire affecting Paragonah could damage homes, barns, outbuildings, livestock shelters, fencing, irrigation equipment, utility equipment, communications lines, signs, agricultural fields, and public facilities. Transportation impacts could include smoke, reduced visibility, debris, downed utility lines, or access disruption along local streets, agricultural access roads, SR-271/old highway connections, nearby I-15 access, and emergency response routes. Additional impacts could include evacuations, livestock losses, crop or forage damage, power and communications outages, increased demand for firefighting water, delayed emergency response, post-fire erosion or debris movement, and higher costs for debris removal, utility restoration, and agricultural recovery.
Parowan City	**Vulnerabilities:** Parowan City is vulnerable to wildfire because homes, businesses, schools, municipal facilities, agricultural lands, irrigation infrastructure, utilities, recreation areas, and visitor travel routes are located near Parowan Valley, Parowan Canyon, SR-143, I-15 access, and routes serving Brian Head and surrounding public lands. Wildfire risk is increased where dry fuels, canyon terrain, wind, drought, lightning, agricultural lands, recreation use, and WUI conditions intersect with homes, public facilities, utilities, and evacuation routes. Parowan's role as a valley community with access routes to Parowan Canyon and Brian Head increases vulnerability if wildfire affects canyon roads, power and communications systems, water supply, or visitor evacuation.

Plan Participant	Vulnerabilities and Impacts
	Impacts: Wildfire affecting Parowan could damage homes, businesses, schools, public buildings, water and wastewater infrastructure, irrigation systems, electric and communications lines, bridges, culverts, agricultural assets, fencing, and visitor-serving facilities. Critical infrastructure and transportation networks that may be affected include I-15 access routes, SR-143, Parowan Canyon Road, local streets, agricultural access roads, electric and communications systems, water and wastewater facilities, schools, municipal facilities, and emergency response routes serving Parowan, Parowan Canyon, and Brian Head. Impacts could include evacuations, smoke exposure, power and communications outages, delayed emergency response, interruption of visitor travel, agricultural damage, school or municipal service disruption, post-fire flooding or debris flows, and substantial costs for suppression, debris removal, utility repair, and recovery.

Winter Storms

Table 121 summarizes winter-storm vulnerabilities and potential impacts for Iron County participants.

Table 121: Winter Storms Vulnerability and Impact Assessment for Iron County

Plan Participant	Vulnerabilities and Impacts
Unincorporated Iron County	**Vulnerabilities:** Unincorporated Iron County is vulnerable to winter storms because dispersed residences, ranches, agricultural facilities, public land access areas, campgrounds, utility corridors, communications sites, water systems, emergency response assets, and rural transportation routes may be exposed to snow, ice, freezing temperatures, strong winds, blowing snow, and hazardous travel conditions. National Weather Service guidance states that winter storms may include snow, ice, sleet, blowing snow, blizzard conditions, ice accumulation, and dangerously low wind chills, and that travel can become difficult or impossible. Rural areas are especially vulnerable where long response distances, limited redundant access, livestock needs, exposed utilities, and road-maintenance demands affect emergency response and service continuity. **Impacts:** Winter storms could cause hazardous travel, stranded motorists, cold-related illness, livestock stress, power and communications outages, frozen or damaged water infrastructure, delayed emergency response, school or facility closures, and increased road-maintenance demands. Critical infrastructure and transportation networks that may be affected include I-15, SR-14, SR-56, SR-130, SR-143, SR-271/old highway connections, county-maintained roads, public land access roads, agricultural access roads, bridges, culverts, electric distribution lines, communications facilities, water systems, fire stations, dispatch systems, and emergency response routes. Ice, snow, wind, and extreme cold could also disrupt supply chains, isolate rural residents, increase heating and sheltering needs, and delay utility restoration.

Plan Participant	Vulnerabilities and Impacts
Brian Head Town	**Vulnerabilities:** Brian Head Town is highly vulnerable to winter storms because of its high-elevation mountain setting, resort and lodging activity, ski-area infrastructure, seasonal visitor population, public safety needs, water and wastewater systems, electric and communications infrastructure, and dependence on SR-143 and local mountain roads. Brian Head Town advises travelers to check road conditions because the community sits at approximately 10,000 feet above sea level, and UDOT provides statewide road weather conditions, cameras, message boards, and sensors through its Traffic website and app. Snow, ice, high winds, blowing snow, avalanche-adjacent travel concerns, and traction requirements can quickly affect access for residents, visitors, employees, public works, EMS, fire response, and utility repair crews. **Impacts:** Winter storms could close or restrict SR-143 and local mountain roads, isolate residents and visitors, increase demand for snow removal and emergency services, interrupt resort operations, delay medical response, and strain lodging, public safety, and public works resources. Impacts could include power and communications outages, frozen water or sewer lines, damaged utility equipment, increased risk of traffic crashes, stranded motorists, hypothermia or frostbite exposure, roof snow-load concerns, and supply delays. Critical infrastructure that may be affected includes town facilities, Brian Head Public Safety facilities, resort facilities, lodging, ski-area infrastructure, water and wastewater systems, electric and communications lines, SR-143, local roads, trailhead access, and emergency response routes.
Cedar City	**Vulnerabilities:** Cedar City is vulnerable to winter storms because it contains Iron County's largest concentration of residents, schools, Southern Utah University, healthcare facilities, public safety facilities, municipal buildings, airport facilities, utilities, major employers, industrial areas, and transportation infrastructure. Winter storms can affect the city through snow, ice, freezing rain, extreme cold, wind chill, blowing snow, and hazardous travel. UDOT identifies weather as a major factor affecting road conditions and provides statewide road weather information, traffic cameras, message boards, and sensors, while NWS winter weather guidance notes that snow, ice, blowing snow, and wind chill can make travel dangerous or impossible and can lead to snapped power lines, falling tree branches, and hypothermia or frostbite risk. **Impacts:** Winter storms affecting Cedar City could disrupt schools, Southern Utah University, healthcare access, public safety operations, municipal services, businesses, airport operations, water and wastewater systems, electric distribution, communications systems, and industrial activity. Critical infrastructure and transportation networks that may be affected include I-15, SR-14, SR-56, SR-130/Main Street, Cross Hollow Road, Iron Springs Road, 4000 North, 6000 North, Cedar City Regional Airport, Union Pacific rail connections, local arterials, traffic signals, public works facilities, water and wastewater systems, electric and communications infrastructure, public safety facilities, and emergency response routes. Potential consequences include power outages, school or campus closures, airport delays, traffic crashes,

Plan Participant	Vulnerabilities and Impacts
	hazardous sidewalks and roads, delayed EMS response, supply disruption, frozen pipes, heating system stress, and increased snow removal and utility restoration costs.
Enoch City	**Vulnerabilities:** The Enoch City is vulnerable to winter storms because residential neighborhoods, schools, municipal facilities, utilities, parks, developing subdivisions, and transportation corridors are located in Cedar Valley where snow, ice, freezing temperatures, wind, and low visibility can affect travel and service delivery. Enoch's reliance on SR-130, Midvalley Road, I-15 access routes, local arterials, school access routes, and emergency response corridors increases vulnerability when winter weather reduces visibility, creates slick pavement, or strains snow removal and public works capacity. Homes, schools, water infrastructure, wastewater systems, electric and communications systems, and residents who rely on medical devices, heat, or transportation assistance are also vulnerable during extended cold or outages. **Impacts:** Winter storms could create hazardous travel, school closures, traffic crashes, delayed emergency response, power and communications outages, frozen waterlines, increased heating needs, and public works demands for snow and ice control. Critical infrastructure and transportation networks that may be affected include SR-130, Midvalley Road, I-15 access routes, local arterials, school access routes, public safety routes, schools, municipal buildings, water and wastewater facilities, electric distribution systems, and communications infrastructure. Impacts could include temporary service disruptions, reduced access between Enoch and Cedar City, delayed utility restoration, increased road maintenance costs, and risks to residents during prolonged cold or power outages.
Town of Kanarraville (regional context)	**Vulnerabilities:** The Town of Kanarraville is vulnerable to winter storms because homes, local roads, bridges, culverts, water infrastructure, utilities, trailhead access, agricultural uses, residents, visitors, and emergency response routes may be affected by snow, ice, freezing temperatures, and hazardous travel along the I-15 corridor and canyon access areas. The town's small road network and reliance on local connections to I-15 increase vulnerability where slick roads, low visibility, or downed utility lines affect access. Residents without reliable heating, older adults, travelers, hikers, outdoor workers, and livestock or small agricultural operations may be more vulnerable during prolonged cold or power outages. **Impacts:** Winter storms could cause hazardous driving, temporary access limitations, power or communications outages, frozen pipes, delayed emergency response, school or work disruption, and increased public works needs for snow and ice control. Critical infrastructure and transportation networks that may be affected include I-15 access routes, frontage roads, local streets, trailhead roads, Kanarra Creek access, bridges, culverts, water system components, electric and communications lines, and emergency response routes. Impacts could include stranded motorists, reduced

Plan Participant	Vulnerabilities and Impacts
	recreation access, temporary isolation, increased heating and sheltering needs, utility restoration delays, and road-maintenance costs.
Town of Paragonah	**Vulnerabilities:** The Town of Paragonah is vulnerable to winter storms because homes, public buildings, local roads, agricultural facilities, livestock operations, irrigation equipment, utility systems, and emergency response routes are exposed in Parowan Valley. Snow, ice, freezing temperatures, wind, and low visibility can affect residents, agricultural workers, livestock producers, school and work travel, public works staff, and emergency responders. Rural access, local streets, agricultural access roads, SR-271/old highway connections, nearby I-15 access, electric and communications systems, water infrastructure, and heating needs increase vulnerability during prolonged cold, power outages, or difficult travel conditions. **Impacts:** Winter storms could cause hazardous travel, vehicle crashes, delayed emergency response, power and communications outages, frozen waterlines, livestock stress, agricultural disruption, and increased public works demands. Transportation and infrastructure impacts could affect local streets, agricultural access roads, SR-271/old highway connections, nearby I-15 access, bridges, culverts, water systems, electric and communications lines, public buildings, and emergency response routes. Potential consequences include temporary isolation, school or work disruption, increased heating and sheltering needs, utility restoration delays, livestock or crop impacts, and higher snow removal and road-maintenance costs.
Parowan City	**Vulnerabilities:** Parowan City is vulnerable to winter storms because homes, businesses, schools, municipal facilities, water and wastewater systems, utilities, agricultural lands, recreation routes, and visitor travel corridors are exposed to snow, ice, freezing temperatures, wind, and reduced visibility in Parowan Valley and along routes to Parowan Canyon and Brian Head. Parowan's reliance on I-15 access, SR-143, Parowan Canyon Road, local streets, and travel connections to Brian Head increases vulnerability where winter weather restricts access, requires traction controls, or delays emergency response. Residents, students, older adults, travelers, outdoor workers, and visitors may be vulnerable during prolonged cold, power outages, or hazardous travel conditions. **Impacts:** Winter storms could cause road closures, hazardous driving, vehicle crashes, school or municipal service disruption, power and communications outages, frozen water or wastewater infrastructure, increased snow removal demands, supply delays, and delayed emergency response. Critical infrastructure and transportation networks that may be affected include I-15 access routes, SR-143, Parowan Canyon Road, local streets, bridges, culverts, schools, municipal buildings, water and wastewater systems, electric and communications systems, agricultural access roads, and emergency response routes serving Parowan, Parowan Canyon, and Brian Head. Impacts could include temporary isolation, visitor travel disruption, increased heating and sheltering needs, utility restoration costs, and higher public works costs for plowing, sanding, drainage, and road repairs.

Changes in Development

Changes in development include recent and planned development, including population changes and future conditions, which may affect the risks and vulnerabilities of the plan participants. Understanding how development can be impacted by the natural hazards profiled in this plan can help participants make sound development decisions, identify necessary mitigation actions, and reduce risk to both new and existing structures.

Iron County has experienced substantial population and housing growth since 2020. Growth trends should be considered when evaluating future exposure; however, growth alone does not demonstrate increased vulnerability unless development has occurred within mapped or otherwise documented hazard-prone areas. Future development review, water-resource planning, floodplain management, wildfire mitigation, geotechnical review, and emergency-access planning remain important tools for reducing long-term risk.

Table 122 distinguishes potential effects of future development from observed changes since the previous plan. The available records do not identify development locations, jurisdiction-owned assets outside the planning area, or completed mitigation by participant sufficiently to determine increased, unchanged, or decreased vulnerability. An indeterminate finding is not a finding of unchanged vulnerability.

Table 122: Vulnerability Changes in Iron County

Plan Participant	Increased	Stayed the Same	Decreased
Unincorporated Iron County	Potential added exposure if development occurs in hazard-prone areas; effects depend on site location, hazard extent, design, infrastructure capacity, and mitigation. No observed increase is established.	Indeterminate: available participant-specific development and mitigation records do not establish whether vulnerability stayed the same.	No decrease is established by the available participant-specific records.
Brian Head Town	Potential added exposure if development occurs in hazard-prone areas; effects depend on site location, hazard extent, design, infrastructure capacity, and mitigation. No observed increase is established.	Indeterminate: available participant-specific development and mitigation records do not establish whether vulnerability stayed the same.	No decrease is established by the available participant-specific records.
Cedar City	Potential added exposure if development occurs in hazard-prone areas;	Indeterminate: available participant-specific development and	No decrease is established by the

Plan Participant	Increased	Stayed the Same	Decreased
	effects depend on site location, hazard extent, design, infrastructure capacity, and mitigation. No observed increase is established.	mitigation records do not establish whether vulnerability stayed the same.	available participant-specific records.
Enoch City	Potential added exposure if development occurs in hazard-prone areas; effects depend on site location, hazard extent, design, infrastructure capacity, and mitigation. No observed increase is established.	Indeterminate: available participant-specific development and mitigation records do not establish whether vulnerability stayed the same.	No decrease is established by the available participant-specific records.
Town of Kanarraville (regional context)	Potential added exposure if development occurs in hazard-prone areas; effects depend on site location, hazard extent, design, infrastructure capacity, and mitigation. No observed increase is established.	Indeterminate: available participant-specific development and mitigation records do not establish whether vulnerability stayed the same.	No decrease is established by the available participant-specific records.
Town of Paragonah	Potential added exposure if development occurs in hazard-prone areas; effects depend on site location, hazard extent, design, infrastructure capacity, and mitigation. No observed increase is established.	Indeterminate: available participant-specific development and mitigation records do not establish whether vulnerability stayed the same.	No decrease is established by the available participant-specific records.
Parowan City	Potential added exposure if development occurs in hazard-prone areas; effects depend on site location, hazard extent, design, infrastructure capacity, and mitigation. No observed increase is established.	Indeterminate: available participant-specific development and mitigation records do not establish whether vulnerability stayed the same.	No decrease is established by the available participant-specific records.

Capability Assessment

The **capability assessment** defines the resources available to support mitigation. A thorough assessment of current mitigation capabilities helps outline who will be responsible for implementing mitigation actions, what current programs, policies, and funding sources could support action implementation, and what new capacity building actions could benefit the community. The local capability inventory describes the planning and administrative framework reported in the annex. Dated ordinance, staffing, and implementation records are not available to independently establish each entry's current status; the inventory does not demonstrate NFIP enforcement or completion of individual mitigation actions.

Unincorporated Iron County Capability Assessment

Table 123 describes the mitigation capabilities for Unincorporated Iron County.

Table 123: Unincorporated Iron County Capability Assessment

Capability	Description
Plans and Regulations	Iron County General Plan, including land use, transportation, housing, environment, public facilities and services, economic development, and water use and preservation elements; Iron County Code of Ordinances, including zoning, subdivision, building, roads, flood damage prevention, and development regulations; Iron County Flood Damage Prevention Ordinance; Iron County Planning Commission and development review procedures; Iron County GIS, floodplain, road, and parcel mapping resources; Iron County Emergency Management programs and regional hazard mitigation planning participation.
Administrative and Technical	Iron County has administrative and technical capabilities through the County Commission, Planning Commission, Planning Department, Building and Zoning functions, Engineering/Road Department, Emergency Management, GIS resources, public works/road maintenance staff, floodplain administration, and coordination with state and federal partners. These capabilities support land use review, permitting, subdivision review, building inspection, road and drainage maintenance, floodplain management, emergency planning, public information, and implementation of mitigation actions.

Capability	Description
Financial	Iron County may support mitigation through the county budget, capital improvement planning, road and public works funding, enterprise or special revenue funds where applicable, development review and permitting fees, grants, and partnerships with state and federal agencies. Potential external funding sources include FEMA Hazard Mitigation Assistance programs, Building Resilient Infrastructure and Communities, Flood Mitigation Assistance, Public Assistance mitigation following disasters, Utah state mitigation and emergency management funding, transportation funding, and natural resource, wildfire, water, or infrastructure grant programs. Listed grant programs are potential funding mechanisms subject to an eligible project, an applicable funding announcement, available appropriations, and award approval; this inventory does not establish an open application period or committed funding.
Education and Outreach	Iron County supports education and outreach through county websites, public meetings, Planning Commission and County Commission agendas, emergency management communications, GIS and public information resources, floodplain and development review information, and coordination with incorporated communities, special districts, state agencies, and federal land managers. Outreach opportunities include sharing information about floodplain development, wildfire preparedness, drought and water conservation, emergency alerts, road closures, winter weather travel, and hazard mitigation plan implementation.
National Flood Insurance Program	• **NFIP Status: FEMA lists** Iron County as an NFIP-participating community (Community 490073). • **Community Rating System:** No CRS class is reported in this entry. • **FEMA Effective Map Entry:** The effective-map field is recorded as 07/17/86(M); this is not a local ordinance-adoption date. • **Floodplain Administration: The available records do not establish the current designated a**dministrator or local implementation responsibilities. County participation and procedures do not establish municipal authority. • **Permitting and Enforce**ment: The available records do not establish local permitting or enforcement implementation. References to Risk MAP in the planning inventory do not document local permit decisions. • **Substantial Improvement/Substantial Damage: Participa**nt-specific implementation records and repetitive-loss/severe-repetitive-loss building counts and types are not established by the available evidence. No zero count or finding of compliance is inferred.

According to FEMA, the hazard mitigation plan must describe the opportunities to expand and improve upon the capabilities described in the plan. For Unincorporated Iron County, this includes:

- **Plans and Regulations:** Continue integrating mitigation considerations into updates to the General Plan, zoning and subdivision regulations, road standards, drainage requirements, the water use and

preservation framework, and flood damage prevention procedures. The county should use development review to reduce exposure to wildfire, flooding, dam failure inundation, geologic hazards, problem soils, drought, and limited emergency access in unincorporated growth areas.

- **Administrative and Technical:** Continue strengthening coordination between Planning, Building/Zoning, Engineering/Roads, Emergency Management, geographic information system (GIS), floodplain administration, public works, and incorporated communities. The county should maintain and expand GIS layers for floodplains, roads, critical facilities, water infrastructure, wildfire risk, geologic hazards, and development constraints to support permitting, project prioritization, emergency response, and mitigation action implementation.
- **Financial:** Continue pursuing federal, state, and regional funding to support flood mitigation, drainage improvements, road and bridge resilience, wildfire fuels reduction, emergency communications, water-supply resilience, geologic hazard studies, and public facility hardening. The county should identify high-priority mitigation projects early enough to align with capital planning, grant cycles, post-disaster funding opportunities, and regional infrastructure partnerships.
- **Education and Outreach:** Expand public outreach on floodplain development requirements, wildfire defensible space, emergency alerts, winter storm travel, drought and water conservation, radon testing, extreme heat safety, and preparedness for residents in rural and unincorporated areas. Outreach should be coordinated with incorporated communities, fire districts, water providers, state agencies, federal land managers, and community organizations to reach dispersed residents, agricultural operators, visitors, and vulnerable populations.
- **National Flood Insurance Program:** Continue enforcing the county's Flood Damage Prevention Ordinance and development permit requirements for areas of special flood hazard. The county should evaluate opportunities to improve floodplain administration through updated floodplain mapping, documented substantial damage/substantial improvement procedures, permit tracking, staff training, public outreach, and consideration of whether future Community Rating System (CRS) participation would be beneficial and feasible.

Brian Head Town Capability Assessment

Table 124 describes the mitigation capabilities for Brian Head Town.

Table 124: Brian Head Town Capability Assessment

Capability	Description
Plans and Regulations	Brian Head Town General Plan; Brian Head Town Code, including zoning, land use, subdivision, building, public works, water, and development regulations; Brian Head Community Wildfire Preparedness Plan; Brian Head Public Safety and Public Works programs; local road, snow-removal, water, wastewater, drainage, and resort community planning processes; coordination with Iron County, Utah Division of Forestry, Fire and State Lands, Dixie National Forest, Cedar Breaks National Monument, and other state and federal partners.
Administrative and Technical	Brian Head has administrative and technical capabilities through the Mayor and Town Council, Planning Commission, town administration, Public Safety Department, Public Works Department, building and land use administration, water and wastewater operations, snow-removal operations, and coordination with county, state, federal, and special district partners. These capabilities support development review, wildfire risk reduction, emergency response, winter storm operations, road maintenance, public information, utility operations, and implementation of mitigation actions in a high-elevation resort community.
Financial	Brian Head may support mitigation through the town budget, capital planning, water and wastewater utility funds, public works funding, public safety funding, development-related fees, resort and tourism-related partnerships, state and federal grants, and intergovernmental partnerships. Potential external funding sources include FEMA Hazard Mitigation Assistance programs, Building Resilient Infrastructure and Communities, Flood Mitigation Assistance where applicable, Public Assistance mitigation following disasters, Utah wildfire and fuels-reduction funding, transportation grants, water infrastructure grants, and recreation or public lands partnership funding. Listed grant programs are potential funding mechanisms subject to an eligible project, an applicable funding announcement, available appropriations, and award approval; this inventory does not establish an open application period or committed funding.
Education and Outreach	Brian Head supports education and outreach through town websites, public meetings, town notices, public safety messaging, wildfire preparedness information, Firewise and defensible space outreach, winter travel and road condition messaging, lodging and visitor communications, and coordination with resort operators, property owners, public land managers, and emergency response partners. Outreach opportunities include wildfire mitigation, evacuation preparedness, winter storm travel safety, drought

Capability	Description
	and water conservation, emergency alerts, radon testing, and visitor preparedness.
National Flood Insurance Program	No separate NFIP or CRS entry for Brian Head was found in the complete Utah Community Status Book records reviewed. County participation does not establish municipal participation; the absence of an entry does not establish absence of local floodplain regulation. The status book establishes program status, not local permitting, enforcement, or substantial-improvement/substantial-damage implementation. Participant-specific implementation records and repetitive-loss/severe-repetitive-loss building counts and types are not established by the available evidence; no zero count or finding of compliance is inferred.

According to FEMA, the hazard mitigation plan must describe the opportunities to expand and improve upon the capabilities described in the plan. For Brian Head Town, this includes:

- **Plans and Regulations:** Continue integrating mitigation considerations into updates to the General Plan, town code, zoning and subdivision regulations, building and development review, public works standards, water and wastewater planning, and wildfire preparedness planning. The town should use land use review and capital planning to reduce exposure to wildfire, landslides, winter storms, flooding, extreme heat, drought, and limited access conditions associated with high-elevation resort development.
- **Administrative and Technical:** Continue strengthening coordination among town administration, Public Safety, Public Works, planning and building functions, utility operators, resort partners, Iron County, the Utah Department of Transportation (UDOT), state wildfire partners, Dixie National Forest, and Cedar Breaks National Monument. The town should maintain current information on critical facilities, evacuation routes, water systems, wildfire risk areas, steep slopes, drainage constraints, and winter access needs to support emergency response and mitigation implementation.
- **Financial:** Continue pursuing grants and partnerships to support wildfire fuels reduction, defensible space, roadway and drainage resilience, emergency communications, water and wastewater system resilience, snow-removal capacity, slope stabilization, and public facility hardening. Projects should be aligned with capital planning, public works priorities, resort-area needs, and state and federal funding cycles.
- **Education and Outreach:** Expand outreach to residents, second-home owners, short-term rental owners, resort operators, employees, and visitors on wildfire defensible space, evacuation routes, emergency alerts, winter storm travel, road closures, snow safety, water conservation, extreme heat and high-elevation recreation safety, and radon testing. Outreach should use town communication channels, lodging and resort partners, public safety messaging, and coordination with public land managers.
- **National Flood Insurance Program (NFIP):** Verify and document the town's current NFIP participation status, floodplain administrator responsibilities, effective Flood Insurance Rate Map (FIRM) information, and any local flood damage prevention procedures. If applicable, the town should

coordinate with Iron County, the Utah Division of Emergency Management, and FEMA to strengthen floodplain administration, drainage documentation, permit tracking, substantial damage/substantial improvement procedures, and public outreach related to development in or near flood-prone drainage areas.

Cedar City Capability Assessment

Table 125 describes the mitigation capabilities for Cedar City.

Table 125: Cedar City Capability Assessment

Capability	Description
Plans and Regulations	Cedar City General Plan, including the 2022 General Plan update and the 2025 Water Use and Preservation Element; Cedar City Municipal Code, including planning and zoning, subdivisions, building codes, streets, waterworks, sewer, wastewater treatment, drainage, airport, and related development regulations; Cedar City engineering standards and details for streets, storm drainage, sewer, water, irrigation, and public infrastructure; Cedar City FEMA and LOMR flood mapping resources; Cedar City GIS maps, including FEMA flood zones, groundwater source protection zones, zoning, streets, sewer, water, storm drain master plan, culinary water master plan, sewer master plan, street master plan, and Wildland Urban Interface Zone mapping; city budget and capital planning documents.
Administrative and Technical	Cedar City has administrative and technical capabilities through the Mayor and City Council, City Manager, Planning Commission, Engineering Department, Public Works Department, building and zoning administration, utilities staff, Police Department, Fire Department, airport operations, GIS resources, finance administration, and floodplain/development permit review functions. These capabilities support planning, permitting, subdivision review, engineering review, public works improvements, storm drainage, road maintenance, water and wastewater operations, emergency response, airport operations, public information, and mitigation action implementation.
Financial	Cedar City may support mitigation through the city budget, capital improvement planning, public works funding, water and wastewater utility funding, transportation and street funding, airport funding, development and permit fees, storm drainage and infrastructure projects, bonds or other financing where approved, state and federal grants, and partnerships with Iron County, UDOT, Central Iron County Water Conservancy District, Southern Utah University, and state and federal agencies. Potential external funding sources include FEMA Hazard Mitigation Assistance programs, Building Resilient Infrastructure and Communities, Flood Mitigation Assistance where applicable, Public Assistance mitigation following disasters, transportation funding, water infrastructure funding, wildfire mitigation funding, and state emergency management or infrastructure

Capability	Description
	grant programs. Listed grant programs are potential funding mechanisms subject to an eligible project, an applicable funding announcement, available appropriations, and award approval; this inventory does not establish an open application period or committed funding.
Education and Outreach	Cedar City supports education and outreach through the city website, City Council and Planning Commission meetings, public notices, general plan and engineering resources, GIS maps, development application materials, floodplain mapping information, public safety messaging, utility communications, budget and project information, and coordination with schools, Southern Utah University, Iron County, water providers, businesses, neighborhoods, and community organizations. Outreach opportunities include floodplain awareness, stormwater and drainage information, wildfire preparedness, drought and water conservation, emergency alerts, extreme heat safety, winter storm travel, radon testing, and preparedness for residents, students, businesses, and visitors.
National Flood Insurance Program	Cedar City participates in the NFIP. FEMA reports Community 490074, an effective-map entry of October 16, 1984, and CRS Class 10, with original entry October 1, 1994, and class effective October 1, 1996. The City's published floodplain development permit documents its own permit framework; Iron County procedures are not used as evidence of municipal administration. The form does not establish the City's current substantial-damage implementation or repetitive-loss building counts.

According to FEMA, the hazard mitigation plan must describe the opportunities to expand and improve upon the capabilities described in the plan. For the Cedar City, this includes:

- **Plans and Regulations:** Continue integrating mitigation considerations into updates to the Cedar City General Plan, zoning and subdivision regulations, engineering standards, stormwater and drainage planning, water and sewer master planning, capital improvement planning, and development review procedures. The city should use land use review and infrastructure planning to reduce exposure to flooding, wildfire, problem soils, drought, extreme heat, severe weather, and transportation-access disruptions in existing and future growth areas.
- **Administrative and Technical:** Continue strengthening coordination among city administration, planning, building, engineering, public works, public safety, utilities, GIS, floodplain administration, airport operations, Southern Utah University, Iron County, UDOT, water providers, and emergency management partners. The city should maintain and expand GIS layers and asset inventories for critical facilities, flood zones, storm drain systems, water and sewer infrastructure, transportation corridors, wildfire risk areas, problem soils, source protection zones, and emergency response routes to support permitting, project prioritization, and mitigation action implementation.
- **Financial:** Continue pursuing local, state, federal, and regional funding to support storm drainage improvements, flood mitigation, road and bridge resilience, wildfire mitigation, water-supply resilience, drought response, emergency communications, public facility hardening, transportation

improvements, and utility system upgrades. The city should align mitigation projects with capital improvement planning, grant cycles, transportation funding, water infrastructure funding, post-disaster funding opportunities, and partnerships with Iron County, state agencies, federal agencies, and institutional partners.

- **Education and Outreach:** Expand public outreach on floodplain requirements, stormwater and drainage issues, wildfire defensible space, drought and water conservation, extreme heat safety, emergency alerts, winter storm travel, radon testing, and preparedness for students, residents, businesses, visitors, and vulnerable populations. Outreach should use city communication channels, public meetings, development review processes, utility messaging, public safety messaging, Southern Utah University coordination, and partnerships with Iron County, water providers, schools, healthcare partners, and community organizations.
- **National Flood Insurance Program:** Continue maintaining and documenting NFIP compliance, including floodplain administration responsibilities, development permitting in areas of special flood hazard, substantial damage and substantial improvement procedures, effective FIRM information, and CRS status. The city should use updated floodplain mapping, stormwater information, GIS data, permit tracking, staff training, and public outreach to improve floodplain management and evaluate whether additional CRS activities could further reduce flood risk and support lower flood insurance costs where feasible.
  - **Adoption of NFIP Minimum Floodplain Management Criteria:** Cedar City's published floodplain development permit requires compliance with the City's Flood Damage Prevention Ordinance; Iron County provisions are not used as evidence of municipal adoption or administration.
  - **Community Rating System:** FEMA reports Class 10, original entry October 1, 1994, and current class effective October 1, 1996. Class 10 provides no CRS premium discount.
  - FEMA Effective Map Entry: October 16, 1984. The effective-map entry is not evidence of the date on which the City adopted an ordinance or map.
  - **Designated Individual or Agency Responsible for NFIP Compliance:** The City permit form assigns review to the Floodplain Administrator; the form does not establish a current staff appointment. Iron County's Commission Chair is not identified as the City's administrator.
  - **Permitting Process in the SFHA: Cedar City's published permit requires approval before work,** compliance with the local Flood Damage Prevention Ordinance, inspections, and final elevation certification and approval. The form documents the permit framework, not completed enforcement decisions.
  - **Substantial Improvement/Substantial Damage Process:** The City permit form treats improvement cost at or above 50% of existing structure value as substantial improvement and requires the entire structure to comply with the relevant ordinance. The form does not establish completed substantial-damage determinations or the City's repetitive-loss/severe-repetitive-loss building counts and types.

Enoch City Capability Assessment

Table 126 describes the mitigation capabilities for Enoch City.

Table 126: Enoch City Capability Assessment

Capability	Description
Plans and Regulations	Enoch City General Plan, revised 2025, including land use, transportation, housing, environmental, public services and facilities, economic development, and water use and preservation elements; Enoch City Land Use Ordinance and zoning regulations; Enoch City online ordinances and municipal code; Enoch City Planning and Zoning resources, including zoning viewer, zoning map, annexation policy materials, subdivision applications, and official maps; Enoch City community development plans, including impact fee facilities plans for water, wastewater, stormwater, transportation, public safety, parks and trails, affordable housing, water conservation, transportation master planning, and capital facilities planning; Enoch City Flood Damage Prevention Ordinance; Cedar Valley Groundwater Management Plan and Enoch Water Conservation Plan.
Administrative and Technical	Enoch has administrative and technical capabilities through the Mayor and City Council, City Manager, Planning Commission, Water Board, Recreation Advisory Board, city administration, planning and zoning staff, public works and utilities functions, floodplain administration, building and development review, finance and budgeting, and coordination with Iron County, regional water providers, state agencies, and emergency management partners. These capabilities support land use review, annexation review, subdivision review, building permitting, water and wastewater planning, stormwater planning, transportation planning, public services, capital facilities planning, public meetings, and implementation of mitigation actions.
Financial	Enoch may support mitigation through the city budget, capital improvement and capital facilities planning, water fund, sewer fund, storm drain fund, transportation impact fees, parks impact fees, public safety impact fees, building permits, business licenses, street and curb permits, Class C road funds, utility fees, intergovernmental revenue, grants, and partnerships with Iron County, UDOT, Central Iron County Water Conservancy District, and state and federal agencies. Potential external funding sources include FEMA Hazard Mitigation Assistance programs, Building Resilient Infrastructure and Communities, Flood Mitigation Assistance where applicable, Public Assistance mitigation after disasters, transportation funding, water infrastructure programs, stormwater and drainage funding, and state emergency management or infrastructure grant programs. Listed grant programs are potential funding mechanisms subject to an eligible project, an applicable funding announcement, available appropriations, and award approval; this inventory does not establish an open application period or committed funding.

Capability	Description
Education and Outreach	Enoch supports education and outreach through the city website, City Council meetings, Planning Commission meetings, Water Board meetings, public notices, agendas and minutes, community development resources, planning and zoning materials, water conservation planning, utility billing and public information, budget and fee schedule documents, and coordination with residents, developers, schools, Iron County, water providers, and community organizations. Outreach opportunities include water conservation, drought preparedness, floodplain development requirements, emergency alerts, wildfire preparedness, winter storm travel, extreme heat safety, radon testing, stormwater and drainage information, and development review requirements.
National Flood Insurance Program	FEMA lists Enoch as an NFIP-participating community (Community 490035). No effective-map date is provided in the status-book entry. FEMA identifies Emergency Program participation, with an entry date of November 1, 2021. No CRS class is reported in this entry. The status book establishes program status, not local permitting, enforcement, or substantial-improvement/substantial-damage implementation. Participant-specific implementation records and repetitive-loss/severe-repetitive-loss building counts and types are not established by the available evidence; no zero count or finding of compliance is inferred.

According to FEMA, the hazard mitigation plan must describe the opportunities to expand and improve upon the capabilities described in the plan. For Enoch City, this includes:

- **Plans and Regulations:** Continue integrating mitigation into updates to the General Plan, land use ordinance, zoning map, subdivision procedures, annexation policy, transportation planning, water conservation planning, stormwater planning, and capital facilities planning. The city should use development review to reduce exposure to flooding, problem soils, drought, wildfire, extreme heat, severe weather, winter storms, and transportation-access constraints in existing neighborhoods and future growth areas.
- **Administrative and Technical:** Continue strengthening coordination among city administration, planning and zoning, the Planning Commission, City Council, City Manager, Water Board, public works and utilities, floodplain administration, finance, Iron County, regional water providers, UDOT, and emergency management partners. The city should maintain current information on critical facilities, water and wastewater infrastructure, stormwater systems, transportation corridors, flood-prone areas, problem soils and fissures, wildfire risk areas, and emergency response routes to support permitting, project prioritization, and mitigation action implementation.
- **Financial:** Continue pursuing local, state, federal, and regional funding to support water conservation, water system resilience, wastewater improvements, stormwater and drainage improvements, road and bridge resilience, emergency communications, public safety infrastructure, and public facility hardening. The city should align mitigation projects with the annual budget, capital improvements

fund, water fund, sewer fund, storm drain fund, transportation impact fee planning, public safety impact fee planning, and state and federal grant cycles.

- **Education and Outreach:** Expand outreach to residents, developers, schools, businesses, and property owners on water conservation, drought preparedness, floodplain development requirements, wildfire defensible space, emergency alerts, winter storm travel, extreme heat safety, radon testing, stormwater maintenance, and geologic hazard awareness. Outreach should use the city website, utility billing communications, public meetings, Planning Commission materials, Water Board materials, public notices, and coordination with Iron County, water providers, and community organizations.
- **National Flood Insurance Program:** Continue maintaining and documenting the city's floodplain administration responsibilities under the Flood Damage Prevention Ordinance, including development permit procedures, floodplain administrator duties, and substantial damage/substantial improvement procedures. The city should verify the latest effective FIRM information, maintain permit and compliance records, provide staff training, coordinate with FEMA and the Utah Division of Emergency Management as needed, and evaluate whether future CRS participation would be feasible and beneficial.
    - **Adoption of NFIP Minimum Floodplain Management Criteria:** Enoch City Code of Ordinance Chapter 12 Land Use Ordinance, 12.900.904 Flood Damage Prevention Ordinance, Article 1 Statutory Authorization, Finding of Facts, Purpose and Methods, Section A- Statutory Authorization.
    - **Community Rating System Level:** None
    - **Adoption of Latest Effective Flood Insurance Rate Map (FIRM):** Not listed
    - **Designated Individual or Agency Responsible for NFIP Compliance:** Enoch City Code of Ordinance Chapter 12 Land Use Ordinance, 12.900.904 Flood Damage Prevention Ordinance, Article 4 Administration, Section A- Designation of Floodplain Administrator: The Enoch City Manager is hereby appointed the Floodplain Administrator to administer and implement the provisions of this ordinance and other appropriate sections of 44 CFR (National Flood Insurance Program Regulations) pertaining to floodplain management.
    - **Permitting Process in the SFHA:** Enoch City Code of Ordinance Chapter 12 Land Use Ordinance, 12.900.904 Flood Damage Prevention Ordinance, Article 4 Administration, Section C- Permit Procedures: Application for a Development Permit shall be presented to the Floodplain Administrator on forms furnished by him/her and may include, but not be limited to, plans in duplicate drawn to scale showing the location, dimensions, and elevation of proposed landscape alterations, existing and proposed structures, including the placement of manufactured homes, and the location of the foregoing in relation to areas of special flood hazard.
    - **Substantial Improvement/Substantial Damage Process:** Enoch City Code of Ordinance Chapter 12 Land Use Ordinance, 12.900.904 Flood Damage Prevention Ordinance, Article 5 Provisions for Flood Hazard Reduction, Section A General Standards: In all areas of special flood hazard, construction standards are required for all new construction and substantial improvements.

Town of Kanarraville Capability Assessment

Table 21 describes the mitigation capabilities for the Town of Kanarraville.

Table 21: Town of Kanarraville Capability Assessment

Capability	Description
Plans and Regulations	Kanarraville Code of Ordinances, including zoning, planning commission, building permit, water, sewage, road, subdivision, and development requirements; Kanarraville Planning and Zoning Commission review procedures; Town Board development approval process; building permit coordination with the Iron County Building Department after Planning and Zoning and Town Board approval; Town culinary water requirements; septic permitting coordination with the Southwest Utah Public Health Department; tree and right-of-way management program; public notice, agenda, and meeting procedures through the Utah Public Notice Website; and town government department responsibilities for culinary water, public safety, parks and recreation, and highways and streets.
Administrative and Technical	Kanarraville has administrative and technical capabilities through the Mayor and Town Board, Town Clerk, Assistant Town Clerk, Planning and Zoning Commission, Appeal Authority, town department assignments for culinary water, public safety, parks and recreation, highways and streets, and coordination with the Iron County Building Department, Southwest Utah Public Health Department, Utah Public Notice Website, and other county and state partners. These capabilities support land use review, development approvals, building permit coordination, water and septic review, public notices, right-of-way and tree management, public safety coordination, roads and streets oversight, and implementation of mitigation actions.
Financial	Kanarraville may support mitigation through the town budget, culinary water funds or utility revenues, development and building-related fees, public works and highways and streets funding, park and recreation funding where applicable, interlocal or contracted services, and partnerships with Iron County, Southwest Utah Public Health Department, state agencies, and federal agencies. Potential external funding sources include FEMA Hazard Mitigation Assistance programs, Building Resilient Infrastructure and Communities, Flood Mitigation Assistance where applicable, Public Assistance mitigation after disasters, Utah emergency management programs, wildfire mitigation funding, water infrastructure funding, transportation or road funding, and grants that support small-community resilience projects. Listed grant programs are potential funding mechanisms subject to an eligible project, an applicable funding announcement, available appropriations, and award approval; this inventory does not establish an open application period or committed funding.
Education and Outreach	Kanarraville supports education and outreach through the town website, Town Board meetings, Planning and Zoning Commission meetings, public

Capability	Description
	notices, agendas, minutes and audio recordings, Town Hall communications, utility and service information, and direct coordination with residents, property owners, developers, visitors, Iron County, and service providers. Outreach opportunities include development review requirements, water and septic requirements, wildfire preparedness, emergency alerts, winter storm travel, drought and water conservation, flood and drainage awareness, radon testing, and recreation safety near Kanarra Creek and canyon access areas.
National Flood Insurance Program	FEMA lists Kanarraville as an NFIP-participating community (Community 490077). The effective-map field is recorded as (NSFHA); this is not a local ordinance-adoption date. No CRS class is reported in this entry. The status book establishes program status, not local permitting, enforcement, or substantial-improvement/substantial-damage implementation. Participant-specific implementation records and repetitive-loss/severe-repetitive-loss building counts and types are not established by the available evidence; no zero count or finding of compliance is inferred.

According to FEMA, the hazard mitigation plan must describe the opportunities to expand and improve upon the capabilities described in the plan. For the Town of Kanarraville, this includes:

- **Plans and Regulations:** Continue integrating mitigation considerations into zoning, planning commission review, Town Board development approvals, building permit coordination, water and sewage requirements, road requirements, right-of-way management, and any future ordinance codification or updates. The town should use development review to reduce exposure to flooding, wildfire, problem soils, drought, severe weather, winter storms, landslides, and limited access concerns near Kanarra Creek, canyon terrain, local streets, I-15 access routes, and trailhead areas.
- **Administrative and Technical:** Continue strengthening coordination among the Town Board, Planning and Zoning Commission, Town Clerk, public safety, culinary water, highways and streets, parks and recreation, Iron County Building Department, Southwest Utah Public Health Department, and emergency management partners. The town should maintain current information on critical facilities, local streets, water infrastructure, trailhead and recreation areas, bridges, culverts, drainage areas, wildfire risk, and emergency response routes to support permitting, response, and mitigation implementation.
- **Financial:** Continue pursuing local, state, federal, and regional funding to support water system resilience, road and culvert improvements, drainage improvements, wildfire mitigation, emergency communications, public facility hardening, and trailhead or visitor-area safety improvements. The town should align mitigation needs with annual budgeting, utility planning, development review, interlocal agreements, Iron County coordination, and state or federal grant opportunities.
- **Education and Outreach:** Expand outreach to residents, property owners, developers, visitors, trail users, and agricultural users on emergency alerts, wildfire defensible space, flood and drainage awareness, Kanarra Creek and canyon safety, winter storm travel, drought and water conservation, radon testing, development review requirements, and septic and water requirements. Outreach

should use the town website, Town Board and Planning and Zoning meetings, public notices, utility/service communications, and coordination with Iron County and other service providers.

- **National Flood Insurance Program:** Verify and document the town's current NFIP status, flood hazard mapping status, and any floodplain administration responsibilities. Although available annex information lists Kanarraville as having no special flood hazard area (NSFHA) with no CRS participation and no listed SFHA permitting or substantial damage process, the town should coordinate with Iron County, the Utah Division of Emergency Management, and FEMA to confirm whether any local floodplain management procedures are needed for drainage, flash flooding, Kanarra Creek, canyon runoff, or future mapped flood hazard areas.
  - **Adoption of NFIP Minimum Floodplain Management Criteria:** None
  - **Community Rating System Level:** None
  - **Adoption of Latest Effective Flood Insurance Rate Map (FIRM):** NSFHA
  - **Designated Individual or Agency Responsible for NFIP Compliance:** None
  - **Permitting Process in the SFHA:** None
  - **Substantial Improvement/Substantial Damage Process:** None

Town of Paragonah Capability Assessment

Table 22 describes the mitigation capabilities for the Town of Paragonah.

Table 22: Town of Paragonah Capability Assessment

Capability	Description
Plans and Regulations	Paragonah Town Code of Ordinances, including Title XV Land Usage, Chapter 150 Building Regulations, Chapter 151 Flood Damage Prevention, Chapter 152 Subdivisions, and Chapter 153 Zoning; Paragonah Town Planning Commission review process for zoning amendments, site plans, and plat applications; Town Board meeting and public hearing procedures; town ordinances and code enforcement procedures; water utility policies and water conservation messaging; annexation policy plan and general master plan resources; building permit, conditional use, business license, utility, road vacation, and development application materials; and public notice, meeting agenda, budget, financial transparency, and town records resources.
Administrative and Technical	Paragonah has administrative and technical capabilities through the Mayor, Town Council/Town Board, Planning Commission, Town Clerk, Town Treasurer, code enforcement, water utilities, parks and recreation, public works and town services, emergency services coordination, and public notice and meeting administration. These capabilities support zoning and subdivision review, site plan and plat review, building and development permit coordination, floodplain administration, water service operations,

Capability	Description
	public meetings, public records, budget administration, resident alerts, and implementation of mitigation actions in a rural agricultural community.
Financial	Paragonah may support mitigation through the town budget, water utility revenues, development and permit fees, business licensing fees, utility fees, impact fees where applicable, public works or local infrastructure funding, interlocal coordination, state and federal grants, and partnerships with Iron County and other service providers. Potential external funding sources include FEMA Hazard Mitigation Assistance programs, Building Resilient Infrastructure and Communities, Flood Mitigation Assistance where applicable, Public Assistance mitigation after disasters, Utah emergency management programs, water infrastructure funding, wildfire mitigation funding, transportation or road funding, and grants that support rural community resilience, floodplain management, and public facility improvements. Listed grant programs are potential funding mechanisms subject to an eligible project, an applicable funding announcement, available appropriations, and award approval; this inventory does not establish an open application period or committed funding.
Education and Outreach	Paragonah supports education and outreach through the town website, email and text alerts, Town Board meetings, Planning Commission meetings, public hearings, agendas and minutes, public notices, water utility information, water conservation reminders, town ordinances, resident resources, financial reports and budgets, and direct communication with residents, property owners, developers, and local service providers. Outreach opportunities include floodplain development requirements, water conservation, drought preparedness, emergency alerts, wildfire preparedness, winter storm travel, extreme heat safety, radon testing, development review requirements, and preservation of the town's rural agricultural character.
National Flood Insurance Program	FEMA lists Paragonah as an NFIP-participating community (Community 490075). The effective-map field is recorded as 06/02/05; this is not a local ordinance-adoption date. No CRS class is reported in this entry. The status book establishes program status, not local permitting, enforcement, or substantial-improvement/substantial-damage implementation. Participant-specific implementation records and repetitive-loss/severe-repetitive-loss building counts and types are not established by the available evidence; no zero count or finding of compliance is inferred.

According to FEMA, the hazard mitigation plan must describe the opportunities to expand and improve upon the capabilities described in the plan. For the Town of Paragonah, this includes:

- **Plans and Regulations:** Continue integrating mitigation considerations into updates to the town code, land use regulations, zoning, subdivision procedures, building regulations, flood damage prevention ordinance, water utility policies, annexation policy plan, general master plan resources, and development review processes. The town should use Planning Commission and Town Board review to

reduce exposure to flooding, drought, wildfire, problem soils, extreme heat, severe weather, winter storms, and transportation-access concerns while preserving the community's rural agricultural character.

- **Administrative and Technical:** Continue strengthening coordination among the Mayor, Town Board, Planning Commission, Town Clerk, Town Treasurer, code enforcement, water utilities, emergency services, Iron County, and other service providers. The town should maintain current information on critical facilities, water infrastructure, local streets, irrigation and drainage features, flood-prone areas, agricultural access routes, utility systems, wildfire risk areas, and emergency response routes to support permitting, public works, emergency response, and mitigation action implementation.

- **Financial:** Continue pursuing local, state, federal, and regional funding to support water system resilience, drainage and flood mitigation, road and culvert improvements, wildfire mitigation, emergency communications, public facility hardening, and rural infrastructure resilience. The town should align mitigation needs with annual budgeting, water utility planning, development review, impact fee or permit fee considerations where applicable, Iron County coordination, and state or federal grant opportunities.
- **Education and Outreach:** Expand outreach to residents, property owners, agricultural users, developers, businesses, and vulnerable populations on emergency alerts, floodplain development requirements, drought and water conservation, wildfire defensible space, winter storm travel, extreme heat safety, radon testing, severe weather preparedness, and development review requirements. Outreach should use the town website, email and text alerts, Town Board and Planning Commission meetings, public notices, utility communications, and coordination with Iron County and local service providers.
- **National Flood Insurance Program:** Continue maintaining and documenting the town's floodplain administration responsibilities under Chapter 151 Flood Damage Prevention, including the Mayor's role as Floodplain Administrator, development permit procedures, effective FIRM information, and substantial damage/substantial improvement procedures. The town should maintain permit and compliance records, coordinate with FEMA and the Utah Division of Emergency Management as needed, provide staff training, and evaluate whether future CRS participation would be feasible or beneficial.
    - **Adoption of NFIP Minimum Floodplain Management Criteria:** Town of Paragonah Code of Ordinance Title XV Land Usage, Chapter 151 Flood Damage Prevention, Section 151.01(A) Statutory Authorization.
    - **Community Rating System Level:** None
    - **Adoption of Latest Effective Flood Insurance Rate Map (FIRM):** 06/02/2005
    - **Designated Individual or Agency Responsible for NFIP Compliance:** Town of Paragonah Code of Ordinance Title XV Land Usage, Chapter 151 Flood Damage Prevention, Section 151.04 Administration, Section 151.04 (A) Designation of Floodplain Administrator: The Mayor is hereby appointed the Floodplain Administrator to administer and implement the provisions of this

chapter and other appropriate sections of 44 C.F.R. (National Flood Insurance Program Regulations) pertaining to floodplain management.

- **Permitting Process in the SFHA:** Town of Paragonah Code of Ordinance Title XV Land Usage, Chapter 151 Flood Damage Prevention, Section 151.04 Administration, Section 151.04 (C) Permit procedures: Application for a development permit shall be presented to the Floodplain Administrator on forms furnished by him or her and may include, but not be limited to, plans in duplicate drawn to scale showing the location, dimensions and elevation of proposed landscape alterations, existing and proposed structures, including the placement of manufactured homes, and the location of the foregoing in relation to areas of special flood hazard.
- **Substantial Improvement/Substantial Damage Process:** Town of Paragonah Code of Ordinance Title XV Land Usage, Chapter 151 Flood Damage Prevention, Section 151.05 Provisions for Flood Hazard Reduction, Section 151.05 (A) General Standards: In all areas of special flood hazard, construction standards are required for all new construction and substantial improvements.

Parowan City Capability Assessment

Table 127 describes the mitigation capabilities for Parowan City.

Table 127: Parowan City Capability Assessment

Capability	Description
Plans and Regulations	Parowan City General Plan, originally completed in 2015; Parowan City Municipal Code, including Title 15 Land Use Code, zoning, subdivision, development standards, building inspection administration, tree care responsibilities, sewer connection limits, and related land use and public facility regulations; Chapter 13.24 Flood Damage Prevention, repealed and replaced in 2025 to comply with current FEMA and Utah floodplain management requirements; Planning and Zoning Department review procedures; City Council ordinance adoption and public notice procedures; building permit process; water, sewer, electric, garbage/recycling, and public facility service policies; and coordination with Iron County, state agencies, federal partners, and regional hazard mitigation planning efforts. Previous planning materials also identify Parowan's planning and zoning code as addressing natural hazard-related requirements for landslide, flood, wildfire, problem soils, and drought hazards.
Administrative and Technical	Parowan has administrative and technical capabilities through the Mayor and City Council, city administration, City Recorder, Planning and Zoning Department, Planning Commission, Board of Adjustments, Airport Board, Library Board, Economic Development Committee, Parowan Theater Board, Power Board, Shade Tree Committee, Water Board, police and fire response, public works and utility operations, and coordination with Iron County, Iron County Emergency Management, the Iron County School District, the Utah

Capability	Description
	Division of Emergency Management, Utah Forestry, Fire and State Lands, UDOT, BLM, USFS, and other public and private partners. These capabilities support land use review, zoning and subdivision review, building permit coordination, floodplain administration, public works and utility operations, emergency response, public notice, public outreach, and implementation of mitigation actions.
Financial	Parowan may support mitigation through the city budget, capital improvement planning, water, sewer, electric, garbage/recycling, and other utility revenues, development and permit fees, business and licensing fees, public works and transportation funding, local government operating funds, interlocal partnerships, and state and federal grants. Potential external funding sources include FEMA Hazard Mitigation Assistance programs, Building Resilient Infrastructure and Communities, Flood Mitigation Assistance where applicable, Public Assistance mitigation after disasters, Joint Highways funding, Utah emergency management programs, water and sewer infrastructure funding, wildfire mitigation funding, transportation grants, state funds, and partnerships with Iron County, UDOT, Iron County School District, Utah Forestry, Fire and State Lands, BLM, USFS, and other agencies. Listed grant programs are potential funding mechanisms subject to an eligible project, an applicable funding announcement, available appropriations, and award approval; this inventory does not establish an open application period or committed funding.
Education and Outreach	Parowan supports education and outreach through the city website, City Council meetings, Planning Commission meetings, public notices, ordinance notices, City Recorder communications, Planning and Zoning resources, building permit information, utility and service communications, Chamber of Commerce coordination, public safety messaging, and coordination with residents, businesses, developers, schools, visitors, Iron County, and regional partners. Outreach opportunities include floodplain development requirements, storm drainage and flood awareness, wildfire defensible space and fuels mitigation, drought and water conservation, radon testing, nonstructural earthquake retrofit information, winter storm travel, extreme heat safety, emergency alerts, visitor preparedness, and public information related to development review and hazard mitigation actions.
National Flood Insurance Program	FEMA lists Parowan as an NFIP-participating community (Community 490076). The effective-map field is recorded as 03/18/86(M); this is not a local ordinance-adoption date. No CRS class is reported in this entry. The status book establishes program status, not local permitting, enforcement, or substantial-improvement/substantial-damage implementation. Participant-specific implementation records and repetitive-loss/severe-repetitive-loss building counts and types are not established by the available evidence; no zero count or finding of compliance is inferred.

According to FEMA, the hazard mitigation plan must describe the opportunities to expand and improve upon the capabilities described in the plan. For Parowan City, this includes:

- **Plans and Regulations:** Continue integrating mitigation considerations into updates to the General Plan, Land Use Code, zoning and subdivision regulations, building inspection procedures, flood damage prevention ordinance, public works standards, utility planning, capital improvement planning, and development review processes. The city should use Planning Commission and City Council review to reduce exposure to flooding, dam failure, wildfire, landslides, problem soils, drought, severe weather, winter storms, earthquake, and limited emergency access concerns affecting Parowan Creek, Parowan Canyon, SR-143, I-15 access, local streets, agricultural lands, schools, public facilities, and visitor routes.
- **Administrative and Technical:** Continue strengthening coordination among the Mayor and City Council, city administration, Planning and Zoning Department, Planning Commission, public works, utilities, police and fire response, floodplain administration, Iron County, Iron County Emergency Management, Iron County School District, UDOT, Utah Division of Emergency Management, Utah Forestry, Fire and State Lands, Bureau of Land Management (BLM), U.S. Forest Service (USFS), and other partners. The city should maintain current information on critical facilities, flood-prone areas, Parowan Creek and drainage infrastructure, bridges and culverts, water and sewer systems, electric utilities, wildfire risk areas, problem soils, emergency response routes, and visitor access routes to support permitting, project prioritization, emergency response, and mitigation action implementation.
- **Financial:** Continue pursuing local, state, federal, and regional funding to support bridge and culvert improvements, storm drainage and detention basin maintenance, floodplain management, wildfire defensible space and fuels reduction, water conservation, utility resilience, emergency communications, seismic safety coordination, public facility hardening, road and access improvements, and geologic or soils evaluations. The city should align mitigation projects with annual budgeting, capital planning, utility revenues, grant cycles, transportation funding, school district coordination, public works priorities, and partnerships with Iron County, UDOT, Utah Forestry, Fire and State Lands, BLM, USFS, and FEMA mitigation grant programs.
- **Education and Outreach:** Expand outreach to residents, businesses, schools, developers, property owners, agricultural users, visitors, Chamber of Commerce partners, and utility customers on floodplain development requirements, Parowan Creek flood risk, wildfire defensible space, fuels mitigation, drought and water conservation, radon testing, nonstructural earthquake retrofits, emergency alerts, winter storm travel, extreme heat safety, visitor preparedness, and development review requirements. Outreach should use the city website, public meetings, ordinance notices, Planning and Zoning materials, utility communications, Chamber of Commerce materials, public safety messaging, and coordination with Iron County and other regional partners.
- **National Flood Insurance Program:** Continue maintaining and documenting the city's floodplain administration responsibilities under Chapter 13.24 Flood Damage Prevention, including development permit procedures, floodplain administrator duties, substantial damage and substantial improvement procedures, effective FIRM information, and flood hazard reduction standards. The city should verify that the 2025 flood damage prevention ordinance update is reflected in local records and plan documentation, maintain permit and compliance records, coordinate with FEMA and the Utah

Division of Emergency Management on Risk Mapping, Assessment, and Planning (Risk MAP) or future mapping updates, provide floodplain management training as needed, and evaluate whether future CRS participation would be feasible and beneficial.

Status of Previous Mitigation Actions

Iron County and its communities have participated in previous iterations of the multi-jurisdictional hazard mitigation plan and identified strategies to mitigate natural hazard risks. Describing the status of previous mitigation actions helps demonstrate the ongoing progress made to reduce risk and the communities' commitment to mitigation. At the same time, it serves as an opportunity to evaluate whether an incomplete action is still worth pursuing. The following table preserves prior actions and distinguishes current strategy concepts from implementation status. Dated project records or participant findings are not available to establish completion, continued implementation, or removal.

Table 128 describes progress made on the mitigation actions identified for Iron County communities in the 2022–2027 hazard mitigation plan.

Table 128: Status of 2022–2027 Mitigation Actions for Iron County

Action Identifier	Action	Status and Explanation
IC-PAROWAN-FLOOD-01	Replace current bridge over Parowan Creek with a new bridge to convey the 100-year floodplain.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-PAROWAN-FLOOD-02	Clean out sediment at City detention basin and clear streams.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-PAROWAN-WILDFIRE-01	Coordinate with the local volunteer fire department for fuels mitigation in the community and maintain a current fire mitigation plan with the Utah Forestry, Fire, and State Lands Division.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued

Action Identifier	Action	Status and Explanation
		implementation, or participant approval of removal is not inferred.
IC-PAROWAN-WILDFIRE-02	Distribute information about fuels mitigation on personal property in Chamber of Commerce welcome packets for new utility users.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-PAROWAN-LANDSLID-01	Develop a revegetation and reseeding strategy for burned slopes in the community to prevent increased risk of flood and debris flows.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-PAROWAN-DROUGHT-01	Replace all grass at City office with xeriscaping.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-PAROWAN-EARTHQUA-01	Inform the public of nonstructural retrofits to secure furniture and equipment.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-PAROWAN-EARTHQUA-02	Coordinate with the Iron County School District to assess and address seismic safety at Parowan schools, as identified in the Utah K–12 public schools URM inventory report.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued

Action Identifier	Action	Status and Explanation
		implementation, or participant approval of removal is not inferred.
IC-PAROWAN-RADON-01	Inform residents of radon testing and mitigation options.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-PAROWAN-PROBLEM--01	Continue to require soils testing prior to development in the community.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-ENOCH-SEVERE-W-01	Develop and harden electrical grid to prevent outages due to natural hazards, solar storms, or manmade disruption to electrical utilities.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-ENOCH-SEVERE-W-02	Secure City owned, critical facilities with generators in the event of electrical disruptions, to ensure that services can be offered to residents.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-ENOCH-WILDFIRE-01	Implement fuels management actions identified in CWPP 2020: Private properties in the WUI, Enoch City owned properties, Summit Mountain.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued

Action Identifier	Action	Status and Explanation
		implementation, or participant approval of removal is not inferred.
IC-ENOCH-WILDFIRE-02	Conduct home assessments at residences in the WUI.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-ENOCH-DROUGHT-01	Work with CICWCD to recharge aquifer through piping of winter runoff and storm water to reduce loss to evaporation.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-ENOCH-DROUGHT-02	Public education about water conservation and drought related actions.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-ENOCH-FLOOD-01	Design and construct sediment debris basins east of I-15 to delay and meter flow of severe runoff.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-ENOCH-FLOOD-02	Purchase property from homeowners to channel flood waters through Enoch City to the north drainage area. Efforts will contribute to water infiltration into the aquifer.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued

Action Identifier	Action	Status and Explanation
		implementation, or participant approval of removal is not inferred.
IC-ENOCH-FLOOD-03	Complete stormwater drainage on the north portion of Half Mile Road.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-ENOCH-LANDSLID-01	Assess vegetation in wildfire prone areas to encourage plants with strong root systems and plan for planting following wildfire events to prevent landslides on bare soil. Use the risk assessment included in the CWPP to help identify these areas.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-ENOCH-EARTHQUA-01	Inventory historically significant structures throughout the community. Provide property owners with information about seismic safety and preservation.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-ENOCH-RADON-01	Provide public education to Enoch residents and property owners about radon risks, testing, and mitigation. Publish education in City newsletter or in utility bills.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-BRIAN-HEAD-T-WILDFIRE-01	Coordinate wildfire preparedness council to engage town in preparedness and public involvement.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued

Action Identifier	Action	Status and Explanation
		implementation, or participant approval of removal is not inferred.
IC-BRIAN-HEAD-T-WILDFIRE-02	Complete the Quaking Aspen restoration project on the southwest end of town.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-BRIAN-HEAD-T-WILDFIRE-03	Assess town owned property for fuels management needs and complete fuels removal.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-BRIAN-HEAD-T-WILDFIRE-04	Coordinate with Resort, BLM, Forest Service, and County to complete wildfire mitigation surrounding the Town.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-BRIAN-HEAD-T-DROUGHT-01	Develop a public education campaign which includes brochures requesting the use of slow the flow practices for municipal water users, not overwatering lawns, and using natural landscaping.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-BRIAN-HEAD-T-EARTHQUA-01	Inspect manholes and sewer utility lines to address damages due to land movement.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued

Action Identifier	Action	Status and Explanation
		implementation, or participant approval of removal is not inferred.
IC-BRIAN-HEAD-T-LANDSLID-01	Coordinate with private and federal partners in revegetating burn scars to prevent erosion and stabilize soils on burn scars.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-BRIAN-HEAD-T-SEVERE-W-01	Communicate through media, social media, and UDOT automated signage to inform travelers of hazardous road conditions or weather.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-BRIAN-HEAD-T-FLOOD-01	Install new 36" culvert at Highland Drive as described in Storm Drain Master Plan.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-BRIAN-HEAD-T-FLOOD-02	Install two new 48" culverts at Loop Road as described in Storm Drain Master Plan.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-BRIAN-HEAD-T-FLOOD-03	Install two new 36" culverts at Forest Drive between Mountain View Drive and Deer Trail as described in Storm Drain Master Plan.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued

Action Identifier	Action	Status and Explanation
		implementation, or participant approval of removal is not inferred.
IC-BRIAN-HEAD-T-FLOOD-04	Install new 36" culvert at Ridgeview St as described in Storm Drain Master Plan.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-BRIAN-HEAD-T-FLOOD-05	Install new 36" culvert at Vasels Rd as described in Storm Drain Master Plan.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-BRIAN-HEAD-T-FLOOD-06	Install new 36" culvert at Village Way as described in Storm Drain Master Plan.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-BRIAN-HEAD-T-RADON-01	Provide radon risk, testing, and mitigation information to residents. Send information using utility billing, town website, and social media.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-CEDAR-MULTI-HA-01	Develop and harden electrical grid to prevent outages due to natural hazards, solar storms, or manmade disruptions to electrical utility services.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued

Action Identifier	Action	Status and Explanation
		implementation, or participant approval of removal is not inferred.
IC-CEDAR-WILDFIRE-01	Implement fuels management actions identified in CWPP 2020, including fuels reduction at Cody Drive, Thunderbird Gardens, private properties in the WUI, Summit Mountain, Ashdown Forest, and Square Top.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-CEDAR-WILDFIRE-02	Assess city buildings and critical facilities in wildfire risk areas to standards identified in the Wildland Urban Interface Code adopted by the City.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-CEDAR-SEVERE-W-01	Educate residents and property owners about insulating pipes and attics to protect against extreme temperatures and prevent burst pipes.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-CEDAR-FLOOD-01	Expand road drainage systems to meet increased runoff from watershed development.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-CEDAR-FLOOD-02	Continue improvements to Leeds Ditch through Cedar City to reduce flooding impacts.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued

Action Identifier	Action	Status and Explanation
		implementation, or participant approval of removal is not inferred.
IC-CEDAR-FLOOD-03	Install and improve roadway drainage features to reduce flooding impacts.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-CEDAR-FLOOD-04	Upgrade existing detention basins and construct new basins to manage runoff from new development.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-CEDAR-FLOOD-05	Install and improve storm drain systems to reduce flooding impacts.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-CEDAR-FLOOD-06	Upgrade flood control structures on Coal Creek to reduce flooding impacts.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-CEDAR-FLOOD-07	Develop and implement programs to remove structures from the floodplain.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued

Action Identifier	Action	Status and Explanation
		implementation, or participant approval of removal is not inferred.
IC-CEDAR-EARTHQUA-01	Retrofit city buildings to address seismic deficiencies.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-CEDAR-EARTHQUA-02	Install emergency generators at critical facilities.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-CEDAR-EARTHQUA-03	Provide public education about earthquake preparedness and risk.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-CEDAR-DROUGHT-01	Promote xeriscaping and water conservation practices.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-CEDAR-DROUGHT-02	Improve water storage capacity and redundancy.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued

Action Identifier	Action	Status and Explanation
		implementation, or participant approval of removal is not inferred.
IC-CEDAR-DROUGHT-03	Develop new water sources and supply infrastructure.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-CEDAR-DROUGHT-04	Upgrade irrigation infrastructure to reduce water loss.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-CEDAR-DROUGHT-05	Implement drought contingency planning and response measures.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-IRON-COUNTY-FLOOD-01	Complete flood studies of Summit, Coal Creek, Little Creek, and Parowan Creek.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-IRON-COUNTY-FLOOD-02	Set new flood channel setback requirements dependent on expected flood rates throughout the County.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued

Action Identifier	Action	Status and Explanation
		implementation, or participant approval of removal is not inferred.
IC-IRON-COUNTY-FLOOD-03	Coordinate with UDOT to increase flood capacity of stormwater infrastructure under I-15.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-IRON-COUNTY-FLOOD-04	Repair rip rap and re-brace the bank in Right Hand Canyon into Coal Creek.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-IRON-COUNTY-FLOOD-05	Post gross vehicle weight at the Urie Creek Bridge in Right Hand Canyon.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-IRON-COUNTY-FLOOD-06	Complete floodplain remapping with FEMA.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-IRON-COUNTY-FLOOD-07	Address flood risk at the bridge near Ladybug Nursery in Cedar City.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued

Action Identifier	Action	Status and Explanation
		implementation, or participant approval of removal is not inferred.
IC-IRON-COUNTY-FLOOD-08	Adopt an ordinance for flood management at Quichapa Lake to set estimated elevations and setbacks of different water levels for development.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-IRON-COUNTY-DROUGHT-01	Develop a dike at Lake Quichapa to direct water to an infiltration pond.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-IRON-COUNTY-DROUGHT-02	Identify recharge areas to increase water recharge capacity. Complete necessary infrastructure to support infiltration.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-IRON-COUNTY-DROUGHT-03	Install measuring devices for groundwater recharge.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-IRON-COUNTY-DROUGHT-04	Complete a groundwater management plan.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued

Action Identifier	Action	Status and Explanation
		implementation, or participant approval of removal is not inferred.
IC-IRON-COUNTY-DROUGHT-05	Adopt updated water rights requirements for secondary homes.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-IRON-COUNTY-WILDFIRE-01	Acquire a woodchipper to support communities in fuels mitigation and creating defensible space.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-IRON-COUNTY-WILDFIRE-02	Set requirements for fuels mitigation surrounding critical County and municipal facilities, including water infrastructure in wildlands.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-IRON-COUNTY-WILDFIRE-03	Complete fuels reduction and mulching in the Cedar Valley near critical Class B roads.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-IRON-COUNTY-EARTHQUA-01	Harden water tanks, pipelines, and other critical water infrastructure identified to cross a mapped quaternary fault.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued

Action Identifier	Action	Status and Explanation
		implementation, or participant approval of removal is not inferred.
IC-IRON-COUNTY-EARTHQUA-02	Install emergency shut off for water pipes at locations which cross mapped fault lines.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-IRON-COUNTY-EARTHQUA-03	Inventory structures in the County constructed with Unreinforced Masonry.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-IRON-COUNTY-EARTHQUA-04	Implement structural and nonstructural retrofit County owned URM structures. Inform private property owners of URM vulnerability and mitigation options.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-IRON-COUNTY-EARTHQUA-05	Acquire backup generators for critical county facilities.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-IRON-COUNTY-SEVERE-W-01	Inventory County owned property for snow load capacity.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued

Action Identifier	Action	Status and Explanation
		implementation, or participant approval of removal is not inferred.
IC-IRON-COUNTY-SEVERE-W-02	Implement necessary improvements on identified County owned structures in need of snow load capacity increase.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-IRON-COUNTY-SEVERE-W-03	Adopt an ordinance which sets a shear protection requirement for utilities at the entry to the home.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-IRON-COUNTY-LANDSLID-01	Inventory County owned water tanks on or near hillsides for stability and seismic resilience.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-IRON-COUNTY-LANDSLID-02	Work with UDOT to implement slope stabilization and/or rockfall catch nets along SR-14 and Highway 143 to prevent rockfall and landslide on roadways.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-IRON-COUNTY-LANDSLID-03	Restore County springs and riparian areas which have caused landslides and flooding.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued

Action Identifier	Action	Status and Explanation
		implementation, or participant approval of removal is not inferred.
IC-IRON-COUNTY-PROBLEM--01	Identify property which has been impacted by problem soils in the community and document impacts.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-IRON-COUNTY-PROBLEM--02	Complete an assessment of erosion and sedimentation on Shurtz Creek. Implement recommended bank stabilization measures.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-IRON-COUNTY-PROBLEM--03	Work with the Utah Geological Survey to update problem soil mapping in Iron County.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-IRON-COUNTY-RADON-01	Provide radon risk, testing, and mitigation information to residents.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-IRON-COUNTY-RADON-02	Work with UGS to assess radon risk in the county.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued

Action Identifier	Action	Status and Explanation
		implementation, or participant approval of removal is not inferred.
IC-IRON-COUNTY-MULTI-HA-01	Conduct a community engagement campaign for natural hazards and personal property mitigation at the County Fair and in coordination with Life Safety events hosted for elementary school students.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-PARAGONAH-FLOOD-01	Expand the existing Red Creek floodway from the mouth of the canyon to west of I-15. Iron County is responsible from the mouth of the canyon to the town boundary and again after it leaves the town boundary to west of I-15. Paragonah is responsible within the town boundary.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-PARAGONAH-FLOOD-02	Complete planning and assessment for flood mitigation needs in Paragonah Canyon.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
IC-PARAGONAH-FLOOD-03	Increase capacity of retention basins, culverts, and stormwater drainage systems.	Status Unknown / Unable to Verify. Implementation status could not be verified from dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.

Mitigation Goals

The communities of Iron County approve the identification of the mitigation goals for the Five County AOG Region as outlined in the base plan including:

- **Goal 1: Protect Life and Property.** Reduce long-term risk to people and public, private, residential, agricultural, and commercial property through appropriate structural and nonstructural mitigation measures.

Objective: Minimize injuries, loss of life, and damage to existing and future public and private assets through feasible, sustained mitigation measures.

- **Goal 2: Protect Critical Facilities, Infrastructure, and Community Lifelines.** Reduce risk to critical facilities, infrastructure systems, and community lifelines and improve their ability to continue or rapidly restore essential functions following natural hazard events.

Objective: Improve the protection, continuity, redundancy, and timely restoration of critical facilities, infrastructure systems, and community lifelines.

- **Goal 3: Strengthen Public Education and Risk Communication.** Improve residents' and visitors' understanding of natural hazards, protective measures, insurance and other risk-transfer options where applicable, and actions they can take to reduce risk.

Objective: Provide accessible, recurring hazard information and practical risk-reduction guidance to residents, businesses, property owners, and visitors.

- **Goal 4: Strengthen Partnerships and Coordination.** Coordinate mitigation planning and implementation among participating jurisdictions and other relevant partners.

Objective: Strengthen coordination, shared implementation, and resource alignment among participating jurisdictions and public, private, nonprofit, and community partners.

- **Goal 5: Strengthen the Resilience of Emergency Services.** Reduce pre-disaster risk to emergency services, personnel, facilities, equipment, communications, access routes, and supporting systems.

Objective: Improve the continuity and resilience of emergency facilities, personnel, equipment, communications, access, mutual aid, and supporting systems.

- **Goal 6: Protect and Use Natural Systems.** Protect, restore, and manage natural systems and landscapes where those measures can reduce natural hazard risk and provide compatible environmental and community benefits.

Objective: Incorporate protection, restoration, and responsible management of natural systems into mitigation where technically feasible and environmentally compatible.

2027–2032 Mitigation Action Plan for Iron County

Participating jurisdictions within Iron County reviewed the regional mitigation action catalog and selected actions responsive to their identified risks, vulnerabilities, capabilities, and development trends. Table 129 identifies each participant's selections. Each participant has at least one action for every hazard carried forward in Table 107. Section 6.2, Mitigation Strategy Actions, in the base plan (the regional sections

preceding the jurisdictional annexes) is incorporated by reference and provides the complete action descriptions, hazards and vulnerabilities addressed, goals, responsible positions or agencies, potential partners and funding sources, implementation timeframes, estimated costs, priorities, and the regional prioritization based on STAPLEE (social, technical, administrative, political, legal, economic, and environmental) criteria and planning-level cost-benefit review. Jurisdictions will implement only the shared actions for which they are listed in Table 129.

Table 129: Iron County Jurisdiction Action Selection Matrix

Mitigation Action	Action Description	Jurisdictions
FCA-DF-01	Update dam-failure warning, evacuation, and public-information procedures for inundation areas.	Unincorporated Iron County; Brian Head Town; Cedar City; Enoch City; Town of Kanarraville; Town of Paragonah; Parowan City
FCA-DF-03	Assess critical infrastructure and development exposure within mapped dam-inundation areas.	Parowan City
FCA-DR-01	Prepare or update a drought-response and water-shortage plan with staged triggers and conservation measures.	Unincorporated Iron County; Brian Head Town; Cedar City; Enoch City; Town of Kanarraville; Town of Paragonah; Parowan City
FCA-DR-02	Develop or diversify water sources, storage, treatment, conveyance, and emergency interconnections.	Cedar City; Town of Paragonah
FCA-DR-03	Reduce water demand through leak detection, efficient fixtures, irrigation upgrades, turf replacement, and waterwise landscaping.	Brian Head Town; Cedar City; Enoch City
FCA-DR-05	Evaluate and implement managed aquifer recharge using winter runoff, stormwater, infiltration areas, or conveyance improvements where technically feasible and legally authorized.	Unincorporated Iron County; Enoch City
FCA-DW-01	Assess and retrofit vulnerable buildings, roofs, signs, rooftop equipment, communications, and utilities for wind loads.	Unincorporated Iron County; Brian Head Town; Cedar City; Enoch City; Town of Kanarraville; Town of Paragonah; Parowan City
FCA-EH-02	Develop a heat-response protocol using forecast triggers, facility hours, transportation options, and targeted notifications.	Unincorporated Iron County; Brian Head Town; Cedar City; Enoch City; Town of Kanarraville; Town of Paragonah; Parowan City

Mitigation Action	Action Description	Jurisdictions
FCA-EQ-01	Inventory and evaluate unreinforced masonry, older public buildings, schools, and critical facilities for retrofit.	Unincorporated Iron County; Brian Head Town; Cedar City; Enoch City; Town of Kanarraville; Town of Paragonah; Parowan City
FCA-EQ-02	Apply seismic codes, flexible utility connections, and equipment anchorage during construction and replacement.	Unincorporated Iron County
FCA-EQ-03	Provide recurring earthquake-risk and nonstructural-mitigation outreach.	Cedar City; Parowan City
FCA-EQ-06	Inspect manholes, sewer lines, water tanks, and other utility assets for land-movement and seismic vulnerabilities and implement prioritized stabilization or retrofit measures.	Unincorporated Iron County; Brian Head Town
FCA-FL-01	Prepare or update stormwater and drainage master plans and inventory culverts, bridges, washes, and detention facilities.	Unincorporated Iron County; Brian Head Town; Cedar City; Enoch City; Town of Kanarraville; Town of Paragonah; Parowan City
FCA-FL-02	Construct prioritized drainage, culvert, bridge, detention, channel, erosion-control, and bank-stabilization improvements.	Unincorporated Iron County; Brian Head Town; Cedar City; Enoch City; Town of Paragonah; Parowan City
FCA-FL-03	Inspect and maintain drainage channels, culverts, detention facilities, and bridge openings.	Parowan City
FCA-FL-04	Strengthen floodplain, erosion-hazard, riparian-setback, and stormwater standards for development.	Unincorporated Iron County
FCA-FL-05	Voluntarily acquire, relocate, or retrofit repeatedly flooded or severely at-risk structures and preserve acquired land as open space when feasible.	Cedar City; Enoch City
FCA-FL-07	Participate in FEMA Risk MAP, local flood-hazard mapping, and National Flood Insurance Program activities; provide residents and property owners with current flood-risk and NFIP information.	Unincorporated Iron County
FCA-FL-10	Design and construct sediment and debris basins, relief drains, spillways, floodways, or other flow-control	Enoch City

Mitigation Action	Action Description	Jurisdictions
	facilities to delay, meter, store, or safely convey severe runoff.	
FCA-HA-01	Evaluate hail exposure and use impact-resistant roofing, glazing, and equipment protection during replacement or construction.	Unincorporated Iron County; Brian Head Town; Cedar City; Enoch City; Town of Kanarraville; Town of Paragonah; Parowan City
FCA-LS-01	Map, monitor, and evaluate landslide, rockfall, and debris-flow areas affecting development and infrastructure.	Unincorporated Iron County; Brian Head Town; Cedar City; Enoch City; Town of Kanarraville; Town of Paragonah; Parowan City
FCA-LS-03	Stabilize priority public slopes and burn scars using drainage, revegetation, erosion control, or engineered treatments.	Brian Head Town; Enoch City
FCA-LS-05	Inventory riverbank and slope stability at priority locations and implement bank stabilization or slope treatments where instability threatens infrastructure or development.	Unincorporated Iron County
FCA-LS-06	Install or upgrade rockfall catchment systems, barriers, nets, benches, or related slope-protection measures at documented roadway and infrastructure exposure locations.	Unincorporated Iron County
FCA-MH-02	Protect essential services through backup power, redundant communications, fuel planning, hardening, and mutual aid.	Cedar City; Enoch City
FCA-MH-03	Integrate hazard data and actions into general plans, capital programs, development review, budgets, and asset management.	Unincorporated Iron County
FCA-MH-06	Assess and harden the electric grid and critical energy systems against natural-hazard outages, including sectionalization, redundancy, vegetation management, equipment protection, and backup generation.	Cedar City; Enoch City
FCA-PS-01	Require subsurface geotechnical investigation and foundation recommendations where problem soils may affect structures.	Unincorporated Iron County; Brian Head Town; Cedar City; Enoch City; Town of Kanarraville; Town of Paragonah; Parowan City

Mitigation Action	Action Description	Jurisdictions
FCA-RN-01	Provide recurring radon-risk, testing, and mitigation information through public and partner channels.	Unincorporated Iron County; Brian Head Town; Cedar City; Enoch City; Town of Kanarraville; Town of Paragonah; Parowan City
FCA-TL-01	Install lightning and surge protection, grounding, backup power, and communications safeguards at critical facilities.	Unincorporated Iron County; Brian Head Town; Cedar City; Enoch City; Town of Kanarraville; Town of Paragonah; Parowan City
FCA-TO-01	Maintain tornado and severe-thunderstorm alerts, shelter guidance, and protective-action messaging.	Unincorporated Iron County; Brian Head Town; Cedar City; Enoch City; Town of Kanarraville; Town of Paragonah; Parowan City
FCA-WI-01	Adopt or update Wildland-Urban Interface standards for defensible space, access, water supply, and ignition-resistant construction.	Unincorporated Iron County; Brian Head Town; Cedar City; Enoch City; Town of Kanarraville; Town of Paragonah; Parowan City
FCA-WI-02	Inventory and reduce hazardous fuels around critical facilities, utilities, roads, and community boundaries.	Unincorporated Iron County; Brian Head Town; Cedar City; Enoch City; Parowan City
FCA-WI-03	Update wildfire protection, evacuation, post-fire revegetation, and burn-scar stabilization priorities.	Brian Head Town
FCA-WI-05	Offer voluntary parcel- or home-level wildfire risk assessments and site visits to identify defensible-space, access, vegetation, and structure-hardening opportunities.	Brian Head Town; Enoch City
FCA-WS-01	Prioritize snow and ice control routes serving critical facilities, schools, and isolated communities.	Unincorporated Iron County; Brian Head Town; Cedar City; Enoch City; Town of Kanarraville; Town of Paragonah; Parowan City
FCA-WS-02	Assess roofs, power, water, and critical facilities for snow, ice, and cold vulnerabilities and implement retrofits.	Unincorporated Iron County

Action Selection and Analysis

Participants considered regulatory, structural and infrastructure, natural-systems, education and awareness, and capability-building alternatives. Selections reflect participant-specific risk and vulnerability findings, capability constraints, prioritization, technical and administrative feasibility, anticipated benefits and costs, environmental considerations, public support, funding potential, and implementation timing.

High-priority actions will be pursued first when feasible; other retained actions may advance as funding, partnerships, technical information, and implementation opportunities become available.

Plan Integration

Plan integration is the process of incorporating information from the hazard mitigation plan into other planning mechanisms or the governance structures that manage long-term community development and decision-making, including budgets, comprehensive plans, economic development strategies, and other long-range planning documents. Plan integration helps promote mitigation project implementation by incorporating data and actions across programs and day-to-day operations.

Integration of the 2022–2027 Plan

The plan participants reviewed integration of the prior plan as shown in Table 130.

Table 130: Iron County Integration of the 2022–2027 Plan

Plan Participant	Description
Unincorporated Iron County	The prior-action table includes flood studies and mapping, wildfire fuels work, water-resource planning, seismic and utility resilience, geologic-hazard work, and public hazard outreach. Inclusion records a prior planning concept; it does not establish continued implementation or incorporation into another planning mechanism. During annual monitoring, Unincorporated Iron County will record specific planning decisions, projects, and outreach activities and retain supporting documentation for the next update.
Brian Head Town	The available record documents continued implementation through the Community Wildfire Preparedness Plan, fuels mitigation, property wildfire assessments, storm-drain improvements, utility maintenance, and public risk communication. During annual monitoring, Brian Head Town will record the specific planning mechanism, decision, project, or outreach activity through which mitigation information was incorporated and retain supporting documentation for the next update.
Cedar City	The available record documents continued implementation through the General Plan and Water Use and Preservation Element, engineering and drainage planning, WUI mapping and code administration, capital projects, utility planning, and public outreach. During annual monitoring, Cedar City will record the specific planning mechanism, decision, project, or outreach activity through which mitigation information was incorporated and retain supporting documentation for the next update.
Enoch City	The available record documents continued implementation through the General Plan, water conservation and groundwater planning, stormwater and capital facilities planning, WUI mitigation, utility resilience, and development review. During annual monitoring, Enoch City will record the specific planning

Plan Participant	Description
	mechanism, decision, project, or outreach activity through which mitigation information was incorporated and retain supporting documentation for the next update.
Town of Kanarraville (regional context)	The prior plan was used through zoning and development review, culinary-water and road planning, septic coordination, public-safety coordination, and public notices. During annual monitoring, Town of Kanarraville will record the specific planning mechanism, decision, project, or outreach activity through which mitigation information was incorporated and retain supporting documentation for the next update.
Town of Paragonah	The available record documents continued implementation through flood-damage prevention, zoning and subdivision review, water utility policies, floodway and drainage planning, and public communications. During annual monitoring, Town of Paragonah will record the specific planning mechanism, decision, project, or outreach activity through which mitigation information was incorporated and retain supporting documentation for the next update.
Parowan City	The available record documents continued implementation through flood-damage prevention, WUI code and wildfire planning, drainage maintenance, utility planning, seismic-safety coordination, development review, and public outreach. During annual monitoring, Parowan City will record the specific planning mechanism, decision, project, or outreach activity through which mitigation information was incorporated and retain supporting documentation for the next update.

Integration of the 2027–2032 Plan

The plan participants identified opportunities to integrate the 2027–2032 plan into other planning mechanisms, as documented in Table 131.

Table 131: Iron County Integration of the 2027–2032 Plan

Plan Participant	Description
Unincorporated Iron County	Integrate selected FCA actions into General Plan and water-use updates, zoning and subdivision review, floodplain management, county road and drainage capital planning, emergency operations, GIS and asset management, annual budgeting, and grant development. During annual monitoring, the participant's designated plan-maintenance representative will coordinate with the applicable planning, public works, utility, building, floodplain, emergency management, finance, and elected functions to identify upcoming updates or decisions, evaluate relevant mitigation information and actions, and document the mechanism reviewed, decision made, responsible function, and implementation status.

Plan Participant	Description
Brian Head Town	Integrate selected FCA actions into the General Plan, Community Wildfire Preparedness Plan, land-use and building review, water and wastewater planning, roadway and storm-drain capital planning, public-safety operations, and annual budgeting. During annual monitoring, the participant's designated plan-maintenance representative will coordinate with the applicable planning, public works, utility, building, floodplain, emergency management, finance, and elected functions to identify upcoming updates or decisions, evaluate relevant mitigation information and actions, and document the mechanism reviewed, decision made, responsible function, and implementation status.
Cedar City	Integrate selected FCA actions into the General Plan, engineering standards, storm-drain, water, sewer, street, airport, and capital improvement planning, WUI administration, emergency management, annual budgets, and grant applications. During annual monitoring, the participant's designated plan-maintenance representative will coordinate with the applicable planning, public works, utility, building, floodplain, emergency management, finance, and elected functions to identify upcoming updates or decisions, evaluate relevant mitigation information and actions, and document the mechanism reviewed, decision made, responsible function, and implementation status.
Enoch City	Integrate selected FCA actions into the General Plan, land-use ordinance, subdivision review, water conservation and groundwater planning, stormwater and transportation plans, capital facilities planning, impact-fee planning, annual budgets, and grant applications. During annual monitoring, the participant's designated plan-maintenance representative will coordinate with the applicable planning, public works, utility, building, floodplain, emergency management, finance, and elected functions to identify upcoming updates or decisions, evaluate relevant mitigation information and actions, and document the mechanism reviewed, decision made, responsible function, and implementation status.
Town of Kanarraville (regional context)	Potential coordination mechanisms in Kanarraville include zoning and development review, culinary-water and road planning, public-safety coordination, budgeting, and county or state grant requests. The available planning roster does not establish a Town implementation or plan-maintenance commitment; this entry provides regional context.
Town of Paragonah	Integrate selected FCA actions into the general master plan, zoning and subdivision review, flood-damage prevention, water utility planning, drainage and roadway planning, annual budgeting, and grant development. During annual monitoring, the participant's designated plan-maintenance representative will coordinate with the applicable planning, public works, utility, building, floodplain, emergency management, finance, and elected functions to identify upcoming updates or decisions, evaluate relevant mitigation information and actions, and document the mechanism reviewed, decision made, responsible function, and implementation status.
Parowan City	Integrate selected FCA actions into the General Plan, Land Use Code, flood-damage prevention, WUI and building review, water, sewer, electric, street and

Plan Participant	Description
	drainage capital planning, annual budgeting, and grant applications. During annual monitoring, the participant's designated plan-maintenance representative will coordinate with the applicable planning, public works, utility, building, floodplain, emergency management, finance, and elected functions to identify upcoming updates or decisions, evaluate relevant mitigation information and actions, and document the mechanism reviewed, decision made, responsible function, and implementation status.

Continued Public Involvement

The plan participants are committed to the maintenance process in the base plan. Table 132 identifies how each participant will continue public involvement during annual monitoring, material amendments, and the five-year update.

Table 132: Continued Public Involvement Approach for Iron County

Plan Participant	Approach
Unincorporated Iron County	Use the county website, County Commission and Planning Commission meetings, emergency management messaging, GIS and floodplain resources, public notices, and coordination with fire districts, water providers, state agencies, and federal land managers to share annual implementation updates and receive public input. At least annually, and whenever a material amendment or five-year update is proposed, the designated plan-maintenance representative will provide access to proposed changes or draft materials, advertise review opportunities, accept public comments, and document how comments were considered.
Brian Head Town	Use town meetings and notices, the town website, public-safety messaging, lodging and resort partners, property-owner communications, and coordination with public-land managers to share implementation updates and receive input from residents, second-home owners, employees, and visitors. At least annually, and whenever a material amendment or five-year update is proposed, the designated plan-maintenance representative will provide access to proposed changes or draft materials, advertise review opportunities, accept public comments, and document how comments were considered.
Cedar City	Use City Council and Planning Commission meetings, the city website, public notices, utility communications, GIS and development-review resources, public-safety messaging, and partnerships with Southern Utah University, schools, businesses, and neighborhoods to share updates and receive input. At least annually, and whenever a material amendment or five-year update is proposed, the designated plan-maintenance representative will provide access to proposed changes or draft materials, advertise review opportunities, accept public comments, and document how comments were considered.

Plan Participant	Approach
Enoch City	Use City Council, Planning Commission, and Water Board meetings, the city website, public notices, utility billing, planning and zoning materials, and coordination with residents, developers, schools, and water providers to share updates and receive input. At least annually, and whenever a material amendment or five-year update is proposed, the designated plan-maintenance representative will provide access to proposed changes or draft materials, advertise review opportunities, accept public comments, and document how comments were considered.
Town of Kanarraville (regional context)	Potential public-involvement mechanisms in Kanarraville include Town Board and Planning and Zoning meetings, the town website, public notices, agendas and minutes, utility communications, and outreach to residents and service providers. The available planning roster does not establish a Town commitment to the plan-maintenance process; this entry provides regional context.
Town of Paragonah	Use Town Board and Planning Commission meetings, public hearings, the town website, email and text alerts, public notices, water-utility communications, and direct outreach to residents, agricultural users, property owners, and developers to share updates and receive input. At least annually, and whenever a material amendment or five-year update is proposed, the designated plan-maintenance representative will provide access to proposed changes or draft materials, advertise review opportunities, accept public comments, and document how comments were considered.
Parowan City	Use City Council and Planning Commission meetings, the city website, public and ordinance notices, utility communications, Chamber of Commerce channels, public-safety messaging, and coordination with schools, businesses, residents, agricultural users, and visitors to share updates and receive input. At least annually, and whenever a material amendment or five-year update is proposed, the designated plan-maintenance representative will provide access to proposed changes or draft materials, advertise review opportunities, accept public comments, and document how comments were considered.

Conclusion

Iron County and its participating municipalities share exposure to the regional hazards profiled in the base plan, but vulnerability and consequences vary by terrain, development pattern, visitation, infrastructure, and local capability. This annex documents participant-specific hazard applicability, vulnerabilities and impacts, capability and NFIP information, changes in development, prior-action records, current mitigation actions, plan integration, and continued public involvement. Dated implementation records are not sufficient to establish action completion, actual development-related vulnerability changes, or all participant-specific NFIP administration findings.

Kane County Annex

County Profile

This county profile summarizes Kane County's geographic, demographic, economic, infrastructure, and development characteristics as context for the participant-specific risk, capability, and mitigation assessments. Countywide totals describe people and assets that could be affected somewhere in the county; they are not estimates of direct exposure to a particular hazard unless the applicable hazard entry identifies a mapped or otherwise documented exposure area.

Geographic Setting and Communities

Kane County is located in southern Utah along the Arizona border and is bordered by Garfield, Iron, San Juan, and Washington Counties in Utah and by Coconino and Mohave Counties in Arizona. The county includes approximately 3,994.1 square miles of land area, and the Colorado River and Lake Powell form much of its eastern edge. Kane County includes the incorporated communities of Alton, Big Water, Glendale, Kanab, and Orderville, with Kanab serving as the county seat and largest city, and it also includes several unincorporated communities such as Bullfrog, Duck Creek Village, and Mount Carmel. The county's geography includes desert basins, mesas, canyons, plateaus, forested high-elevation areas, river and reservoir shorelines, and extensive public lands and access to regional recreation destinations including Zion National Park, Bryce Canyon National Park, Grand Staircase–Escalante National Monument, Glen Canyon National Recreation Area, Coral Pink Sand Dunes State Park, Kodachrome Basin State Park, and other recreation destinations.[215] These geographic conditions shape the county's hazard mitigation context because residents, visitors, transportation routes, utilities, recreation areas, and emergency services are dispersed across long distances and varied terrain.[215][216]

[215] Five County Association of Governments Natural Hazard Mitigation Plan, effective 2022–2027. https://hazards.utah.gov/wp-content/uploads/NHMP2022_FINAL-071422_Reduced-File-Size.pdf.
[216] U.S. Census Bureau, Kane County, Utah profile, land area and neighboring counties. https://data.census.gov/all?q=Kane+County,+Utah. The Census profile ranks total area; the land-area ranking in the narrative requires separate confirmation.

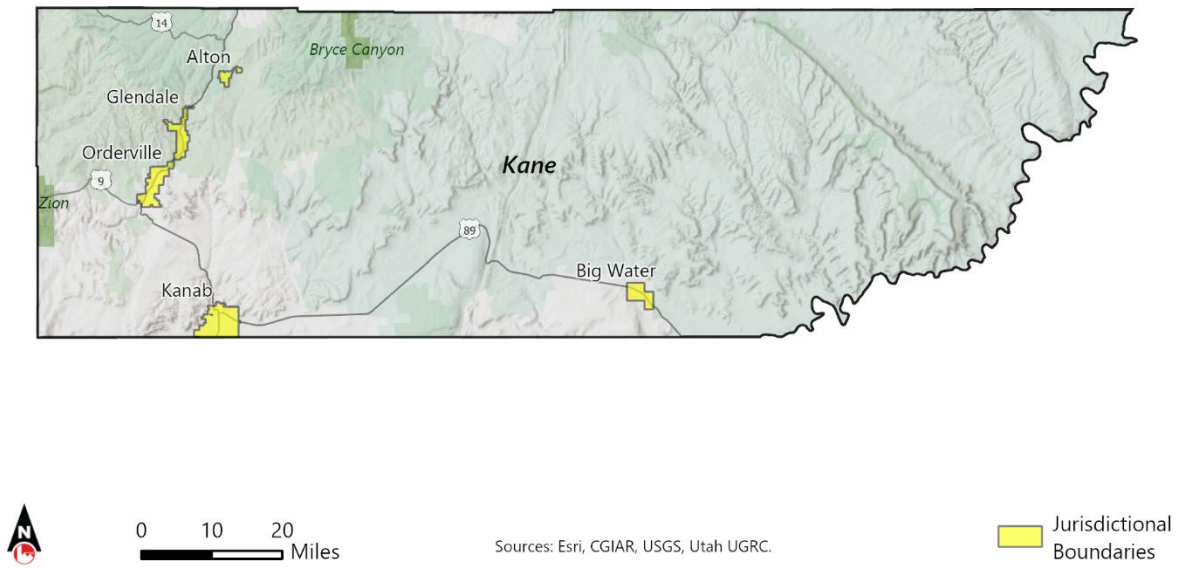


Figure 52: Jurisdictional Boundaries of Kane County

Population and Housing

The U.S. Census Bureau reports a 2020 Census population of 7,667 and a July 1, 2025 population estimate of 8,597, 12.1% above the 2020 estimates base. The county had an estimated 6,979 housing units in 2025 and approximately 3,456 households in 2020–2024. The owner-occupied housing-unit rate was 80.4%, average household size was 2.28 persons, and persons age 65 or older represented 26.7% of the population. These characteristics inform warning, evacuation, sheltering, continuity, and recovery planning for dispersed rural residents, older adults, seasonal residents, and visitors.[217]

Economy and Critical Infrastructure

Kane County's economy is closely tied to tourism, recreation, services, public lands, local government, agriculture, ranching, and small businesses. The U.S. Census Bureau reported 2022 accommodation and food services sales of $178.953 million and 2022 retail sales of $105.998 million, reflecting the importance of visitor-serving activity to the local economy. Kane County and state educational resources identify tourism and services as major economic drivers, with points of interest including Lake Powell, Coral Pink Sand Dunes State Park, Kodachrome Basin State Park, Grand Staircase-Escalante National Monument, Bryce Canyon National Park, Zion National Park, and related gateway communities.[218] Critical infrastructure serving the county includes county and municipal government facilities, schools, public safety and emergency response facilities, Kane County Hospital and healthcare access in Kanab, U.S.

[217] U.S. Census Bureau, QuickFacts: Kane County, Utah, V2025 population/housing estimates, 2020 Census, 2020-2024 ACS, 2022 Economic Census, and 2025 building permits. https://www.census.gov/quickfacts/fact/table/kanecountyutah/PST045225. Accessed October 9, 2026.
[218] Kane County, Office of Tourism, 2026. https://kane.utah.gov/204/Tourism.

Highway 89, State Route 9, State Route 12 approaches, local roads, bridges, culverts, water and wastewater systems, electric and communications networks, dams, public land access routes, campgrounds, marinas, and visitor-serving facilities. Because infrastructure, services, and destinations are distributed across a large rural geography, disruptions to roads, utilities, communications, healthcare access, water systems, public safety facilities, or recreation destinations can have countywide consequences during floods, wildfire, winter storms, severe weather, landslides, dam failure, drought, or other hazards.[219]

Land Use, Planning, and Mitigation Context

Kane County's land use and mitigation context is shaped by its rural settlement pattern, extensive public lands, recreation and tourism destinations, agricultural and ranching areas, small, incorporated communities, and development concentrated in Kanab, other towns, travel corridors, and visitor-serving areas. Kane County's official local information identifies Kanab as the largest city and county seat, identifies Alton, Big Water, Glendale, and Orderville as the other towns, and identifies unincorporated communities including Bullfrog, Duck Creek Village, and Mount Carmel. For Kane County, future development and redevelopment should consider wildfire exposure, flash flood and drainage corridors, low-water crossings, steep slopes, landslide and rockfall areas, problem soils, drought and water supply conditions, extreme heat exposure, winter access, seismic risk, visitor evacuation and sheltering needs, and protection of community lifelines and critical facilities. These considerations are especially important where growth, recreation access, short-term lodging, rural residential development, utilities, and transportation routes overlap with public lands, canyon terrain, flood-prone washes, wildland-urban interface areas, and limited redundant access routes.

[219] U.S. Census Bureau, QuickFacts: Kane County, Utah, V2025 population/housing estimates, 2020 Census, 2020-2024 ACS, 2022 Economic Census, and 2025 building permits. https://www.census.gov/quickfacts/fact/table/kanecountyutah/PST045225. Accessed October 9, 2026.

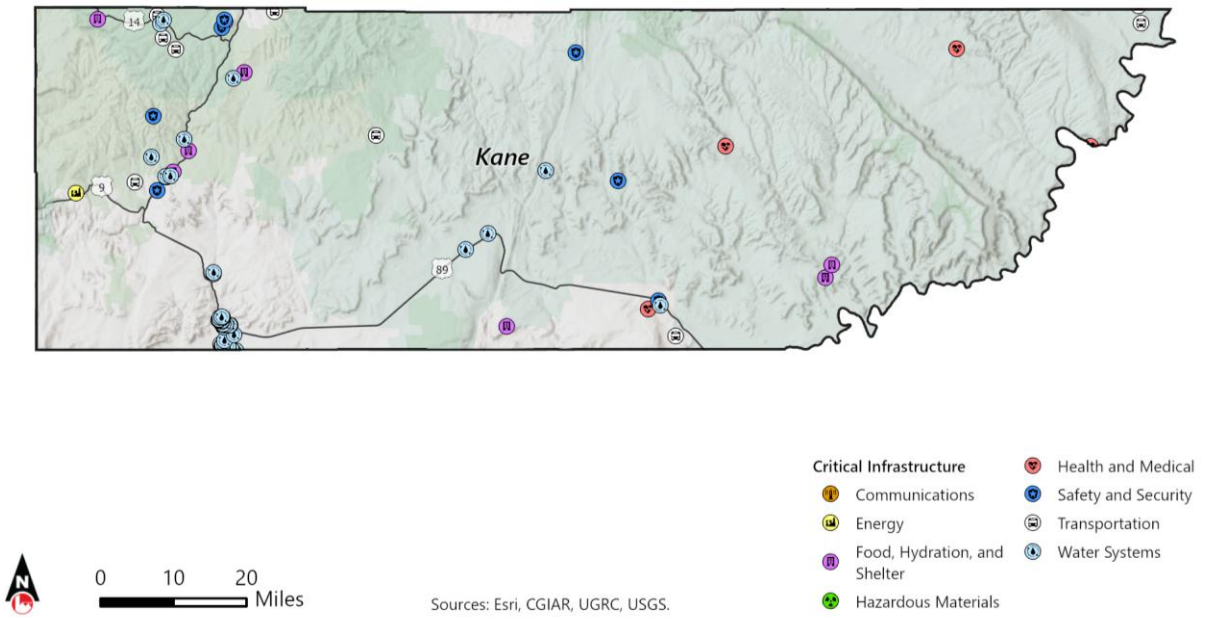


Figure 53: Kane County Critical Infrastructure Map

Hazard Identification

Each participating jurisdiction considered the hazards profiled for the Five County AOG Region. Table 133 identifies any hazards omitted by Kane County, Alton, Big Water, Glendale, Kanab, or Orderville. When no supported omission is documented, all regional hazards are treated as applicable to the participant.

Table 133: Rationale for Participants Omitting Hazards in Kane County

Plan Participant	Hazard	Rationale for Omitting Hazard
Unincorporated Kane County	Dam Failure; Damaging Winds; Drought; Earthquake; Extreme Heat; Flooding; Hail; Landslide; Problem Soils; Radon Gas; Thunderstorms and Lightning; Tornadoes; Wildfire; Winter Storms	No participant-specific omission is documented; all regional hazards are carried forward.
Town of Alton	Dam Failure; Damaging Winds; Drought; Earthquake; Extreme Heat; Flooding; Hail; Landslide; Problem Soils; Radon Gas; Thunderstorms and Lightning; Tornadoes; Wildfire; Winter Storms	No participant-specific omission is documented; all regional hazards are carried forward.
Town of Big Water	Dam Failure; Damaging Winds; Drought; Earthquake; Extreme Heat; Flooding; Hail; Landslide; Problem Soils; Radon Gas; Thunderstorms and Lightning; Tornadoes; Wildfire; Winter Storms	No participant-specific omission is documented; all regional hazards are carried forward.

Plan Participant	Hazard	Rationale for Omitting Hazard
Town of Glendale	Dam Failure; Damaging Winds; Drought; Earthquake; Extreme Heat; Flooding; Hail; Landslide; Problem Soils; Radon Gas; Thunderstorms and Lightning; Tornadoes; Wildfire; Winter Storms	No participant-specific omission is documented; all regional hazards are carried forward.
City of Kanab	Dam Failure; Damaging Winds; Drought; Earthquake; Extreme Heat; Flooding; Hail; Landslide; Problem Soils; Radon Gas; Thunderstorms and Lightning; Tornadoes; Wildfire; Winter Storms	No participant-specific omission is documented; all regional hazards are carried forward.
Town of Orderville	Dam Failure; Damaging Winds; Drought; Earthquake; Extreme Heat; Flooding; Hail; Landslide; Problem Soils; Radon Gas; Thunderstorms and Lightning; Tornadoes; Wildfire; Winter Storms	No participant-specific omission is documented; all regional hazards are carried forward.

Vulnerability and Impact Assessment

The vulnerability and impact assessment identifies the people, structures, critical facilities, infrastructure systems, economic activities, natural resources, and other community assets that may be affected by each applicable hazard. Countywide population, housing, facility, and infrastructure figures provide planning context and should not be interpreted as direct hazard exposure unless supported by a mapped footprint, scenario, or documented event. The regional hazard profiles provide hazard characteristics, location, extent, previous occurrences, probability, methodology, and future conditions; this annex supplements those profiles with participant-specific consequences and planning considerations. Facility and infrastructure entries are qualitative planning considerations drawn from the annex inventory. They identify asset types and potential service consequences; they do not represent a verified complete current inventory, a mapped exposure count, or a modeled loss estimate. Inclusion in a county or municipality does not establish that a facility lies within a particular hazard footprint.

Dam Failure

Table 134 summarizes dam failure vulnerabilities and potential impacts for Kane County participants.

Table 134: Dam Failure Vulnerability and Impact Assessment for Kane County

Plan Participant	Vulnerabilities and Impacts
Unincorporated Kane County	**Vulnerabilities:** The Utah Division of Water Rights listing identifies Jackson Flat Reservoir, Alton Reservoir, Kanab City–Tom's Canyon Flood Control, and Cove Dam as high-hazard-potential dams in Kane County. Hazard-potential classification describes the consequences of failure or misoperation; it does

Plan Participant	Vulnerabilities and Impacts
	not describe structural condition or probability of failure. County location alone does not establish direct exposure for Unincorporated Kane County; inundation mapping or emergency action plans define the relevant downstream areas. This annex does not quantify assets within those areas.[220] **Impacts:** A dam incident could cause rapid flooding, erosion, debris, road and utility damage, evacuation, access disruption, and agricultural or recreation losses within documented downstream inundation areas. Consequences depend on the dam, failure mode, warning time, downstream development, and exposed assets. A dam incident could result in injury or loss of life, damage to structures and transportation routes, disruption of utilities and emergency access, and losses to recreation, agriculture, and other county assets located downstream of dams. Planning considerations include county government and emergency-response facilities, water and communications systems, rural roads, bridges, culverts, and recreation access routes. Direct damage is possible only where assets lie within documented downstream inundation areas; access and service interruptions may extend beyond those areas. These are potential consequences, not a mapped exposure count.
Town of Alton	**Vulnerabilities:** The Utah Division of Water Rights listing identifies Jackson Flat Reservoir, Alton Reservoir, Kanab City–Tom's Canyon Flood Control, and Cove Dam as high-hazard-potential dams in Kane County. Hazard-potential classification describes the consequences of failure or misoperation; it does not describe structural condition or probability of failure. County location alone does not establish direct exposure for the Town of Alton; inundation mapping or emergency action plans define the relevant downstream areas. This annex does not quantify assets within those areas. **Impacts**: A dam incident could cause rapid flooding, erosion, debris, road and utility damage, evacuation, access disruption, and agricultural or recreation losses within documented downstream inundation areas. Consequences depend on the dam, failure mode, warning time, downstream development, and exposed assets. Potential impacts include localized flooding, damage to homes or public infrastructure in inundation areas, road closures, utility disruption, and temporary interruption of emergency access or community services. Planning considerations include community and public-service facilities, local water and utility systems, roads, and drainage crossings. Direct damage is possible only where assets lie within documented downstream inundation areas; access and service interruptions may extend beyond those areas. These are potential consequences, not a mapped exposure count.
Town of Big Water	**Vulnerabilities:** The Utah Division of Water Rights listing identifies Jackson Flat Reservoir, Alton Reservoir, Kanab City–Tom's Canyon Flood Control, and Cove Dam as high-hazard-potential dams in Kane County. Hazard-potential classification describes the consequences of failure or misoperation; it does

[220] Utah Division of Water Rights, dam-safety inventory listing, retrieved October 10, 2026. https://www.waterrights.utah.gov/damsafety/nid_list. Hazard-potential ratings describe downstream consequences, not dam condition or failure likelihood.

Plan Participant	Vulnerabilities and Impacts
	not describe structural condition or probability of failure. County location alone does not establish direct exposure for the Town of Big Water; inundation mapping or emergency action plans define the relevant downstream areas. This annex does not quantify assets within those areas. **Impacts:** A dam incident could cause rapid flooding, erosion, debris, road and utility damage, evacuation, access disruption, and agricultural or recreation losses within documented downstream inundation areas. Consequences depend on the dam, failure mode, warning time, downstream development, and exposed assets. A dam failure or emergency release could cause flooding that damages structures and infrastructure, affects access routes, disrupts utilities, and creates safety risks for residents and visitors in low-lying or drainage-adjacent areas. Planning considerations include public-service and visitor-serving facilities, water and utility systems, roads, and recreation access routes. Direct damage is possible only where assets lie within documented downstream inundation areas; access and service interruptions may extend beyond those areas. These are potential consequences, not a mapped exposure count.
Town of Glendale	**Vulnerabilities:** The Utah Division of Water Rights listing identifies Jackson Flat Reservoir, Alton Reservoir, Kanab City–Tom's Canyon Flood Control, and Cove Dam as high-hazard-potential dams in Kane County. Hazard-potential classification describes the consequences of failure or misoperation; it does not describe structural condition or probability of failure. County location alone does not establish direct exposure for the Town of Glendale; inundation mapping or emergency action plans define the relevant downstream areas. This annex does not quantify assets within those areas. **Impacts:** A dam incident could cause rapid flooding, erosion, debris, road and utility damage, evacuation, access disruption, and agricultural or recreation losses within documented downstream inundation areas. Consequences depend on the dam, failure mode, warning time, downstream development, and exposed assets. Potential impacts include flooding of vulnerable structures and local infrastructure, damage to roads or crossings, disruption to utilities and emergency response, and safety risks where flood depths or velocities are high. Planning considerations include public-service facilities, water and utility systems, roads, bridges, culverts, and agricultural access routes. Direct damage is possible only where assets lie within documented downstream inundation areas; access and service interruptions may extend beyond those areas. These are potential consequences, not a mapped exposure count.
City of Kanab	**Vulnerabilities:** The Utah Division of Water Rights listing identifies Jackson Flat Reservoir, Alton Reservoir, Kanab City–Tom's Canyon Flood Control, and Cove Dam as high-hazard-potential dams in Kane County. Hazard-potential classification describes the consequences of failure or misoperation; it does not describe structural condition or probability of failure. County location alone does not establish direct exposure for the City of Kanab; inundation

Plan Participant	Vulnerabilities and Impacts
	mapping or emergency action plans define the relevant downstream areas. This annex does not quantify assets within those areas. **Impacts:** A dam incident could cause rapid flooding, erosion, debris, road and utility damage, evacuation, access disruption, and agricultural or recreation losses within documented downstream inundation areas. Consequences depend on the dam, failure mode, warning time, downstream development, and exposed assets. A dam incident affecting the City of Kanab could result in public safety risks, property damage, disruption to transportation and utilities, interruption of government or emergency services, and economic impacts to businesses and community activity in affected areas. Planning considerations include Kane County Hospital, schools, government and emergency-service buildings, water and utility systems, roads, and drainage infrastructure. Direct damage is possible only where assets lie within documented downstream inundation areas; access and service interruptions may extend beyond those areas. These are potential consequences, not a mapped exposure count.
Town of Orderville	**Vulnerabilities:** The Utah Division of Water Rights listing identifies Jackson Flat Reservoir, Alton Reservoir, Kanab City–Tom's Canyon Flood Control, and Cove Dam as high-hazard-potential dams in Kane County. Hazard-potential classification describes the consequences of failure or misoperation; it does not describe structural condition or probability of failure. County location alone does not establish direct exposure for the Town of Orderville; inundation mapping or emergency action plans define the relevant downstream areas. This annex does not quantify assets within those areas. **Impacts:** A dam incident could cause rapid flooding, erosion, debris, road and utility damage, evacuation, access disruption, and agricultural or recreation losses within documented downstream inundation areas. Consequences depend on the dam, failure mode, warning time, downstream development, and exposed assets. Potential impacts include localized flooding, damage to roads, crossings, utilities, and structures, disruption of access and emergency response, and safety risks for people in downstream areas with limited warning time. Planning considerations include public-service facilities, water and utility systems, roads, bridges, culverts, and visitor-access routes. Direct damage is possible only where assets lie within documented downstream inundation areas; access and service interruptions may extend beyond those areas. These are potential consequences, not a mapped exposure count.

Damaging Winds

Table 135 summarizes damaging winds vulnerabilities and potential impacts for Kane County participants.

Table 135: Damaging Winds Vulnerability and Impact Assessment for Kane County

Plan Participant	Vulnerabilities and Impacts
Unincorporated Kane County	**Vulnerabilities:** Unincorporated Kane County includes exposed desert basins, mesas, canyon systems, open plateau terrain, regional transportation corridors, dispersed housing, utilities, recreation sites, agricultural and ranching assets, and visitor-serving facilities that are exposed to damaging winds. These assets are vulnerable to thunderstorm outflow winds, strong pressure-gradient winds, blowing dust, debris, downed power lines, and service interruptions, especially where long utility lines and limited alternate routes affect access and restoration. **Impacts:** Damaging winds could damage roofs, manufactured housing, sheds, barns, fences, signs, utility lines, and other exposed structures; create hazardous travel conditions from crosswinds, blowing dust, sand, and debris; disrupt communications and power; delay emergency response; and interrupt recreation, tourism, agricultural operations, and access to remote areas. Planning considerations include county government and emergency-response facilities, water and communications systems, rural roads, bridges, culverts, and recreation access routes. Wind damage, debris, and outages can interrupt facility operations and emergency access. These are potential consequences, not a mapped exposure count.
Town of Alton	**Vulnerabilities:** The Town of Alton's residents, homes, local roads, utilities, community facilities, and nearby agricultural or ranching assets are exposed to damaging winds across open and elevated terrain. The town's smaller transportation network and reliance on utility and access connections increase vulnerability when windblown debris, downed lines, or reduced visibility affect roads and services. **Impacts:** Potential impacts include roof, siding, window, fence, sign, and outbuilding damage; localized power or communications outages; hazardous travel from crosswinds or blowing debris; temporary road closures; and delayed emergency response or restoration of services. Planning considerations include community and public-service facilities, local water and utility systems, roads, and drainage crossings. Wind damage, debris, and outages can interrupt facility operations and emergency access. These are potential consequences, not a mapped exposure count.
Town of Big Water	**Vulnerabilities:** The Town of Big Water's residents, structures, roads, utilities, and visitor-serving or recreation-related assets are exposed to damaging winds in an arid, open landscape near Lake Powell and regional travel routes. Low-lying, exposed, and recreation-oriented areas are vulnerable to strong winds, blowing dust and sand, debris, power disruptions, and hazardous travel conditions. **Impacts:** Damaging winds could damage roofs, signs, manufactured housing, utility lines, outbuildings, and recreation-related facilities; reduce visibility on local and regional roads; disrupt power, communications, fuel access, and visitor services; and create safety risks for residents, travelers, and recreation users. Planning considerations include public-service and visitor-serving

Plan Participant	Vulnerabilities and Impacts
	facilities, water and utility systems, roads, and recreation access routes. Wind damage, debris, and outages can interrupt facility operations and emergency access. These are potential consequences, not a mapped exposure count.
Town of Glendale	**Vulnerabilities:** The Town of Glendale's developed areas, homes, local roads, utilities, public facilities, and agricultural or ranching assets are exposed to damaging winds in open valley and canyon-adjacent settings. Lightweight structures, overhead utilities, fences, signs, outbuildings, and road corridors are vulnerable to debris impacts, downed lines, and reduced visibility during strong wind events. **Impacts:** Potential impacts include damage to roofs, siding, windows, fences, signs, and outbuildings; downed power or communication lines; road debris or closures; hazardous travel conditions; disruption of utilities and emergency access; and cleanup or repair costs for public and private property. Planning considerations include public-service facilities, water and utility systems, roads, bridges, culverts, and agricultural access routes. Wind damage, debris, and outages can interrupt facility operations and emergency access. These are potential consequences, not a mapped exposure count.
City of Kanab	**Vulnerabilities:** The City of Kanab contains the county's largest concentration of residents, homes, businesses, roads, utilities, schools, public buildings, and community services. Because damaging winds can affect developed areas, overhead utilities, transportation routes, signs, roofs, and lightweight structures, the City of Kanab has increased exposure where population, infrastructure, and visitor-serving activity are concentrated. **Impacts:** Damaging winds affecting the City of Kanab could cause property damage, downed trees or utility lines, localized power and communications outages, debris-blocked roads, hazardous travel, interruption of government or emergency services, and economic impacts to businesses, tourism activity, and community operations. Planning considerations include Kane County Hospital, schools, government and emergency-service buildings, water and utility systems, roads, and drainage infrastructure. Wind damage, debris, and outages can interrupt facility operations and emergency access. These are potential consequences, not a mapped exposure count.
Town of Orderville	**Vulnerabilities:** The Town of Orderville's residents, structures, local roads, utilities, community assets, and nearby agricultural or visitor-serving uses are exposed to damaging winds in open and canyon-influenced terrain. Roads, crossings, overhead utilities, signs, fences, outbuildings, and lightweight structures are vulnerable to wind damage, debris, reduced visibility, and service interruptions. **Impacts:** Potential impacts include roof, siding, fence, sign, and outbuilding damage; power or communications outages; road debris or closures; hazardous driving conditions from crosswinds and blowing dust; delays in emergency response; and temporary disruption to residents, businesses, agriculture, and visitor travel. Planning considerations include public-service facilities, water and utility systems, roads, bridges, culverts, and visitor-access

Plan Participant	Vulnerabilities and Impacts
	routes. Wind damage, debris, and outages can interrupt facility operations and emergency access. These are potential consequences, not a mapped exposure count.

Drought

Table 136 summarizes drought vulnerabilities and potential impacts for Kane County participants.

Table 136: Drought Vulnerability and Impact Assessment for Kane County

Plan Participant	Vulnerabilities and Impacts
Unincorporated Kane County	**Vulnerabilities:** Unincorporated Kane County contains large areas of rangeland, agricultural land, dispersed residences, small water systems, springs, groundwater-dependent supplies, recreation landscapes, and natural resource areas that are exposed to prolonged precipitation deficits, reduced snowpack, lower runoff, reduced soil moisture, and stressed vegetation. These assets are vulnerable because drought can reduce water availability for domestic use, livestock, irrigation, fire suppression, recreation, and watershed health across broad areas of the county. **Impacts:** Drought could reduce forage quality and rangeland productivity, increase feed and water costs for ranching operations, stress municipal and domestic water supplies, reduce water available for irrigation and livestock watering, degrade vegetation and habitat, increase dust and wildfire potential, and affect recreation and tourism where landscape conditions, water availability, or access to natural resources decline. Planning considerations include county government and emergency-response facilities, water and communications systems, rural roads, bridges, culverts, and recreation access routes. Water shortages can constrain facility operations, fire suppression, and service continuity; transportation effects are generally indirect. These are potential consequences, not a mapped exposure count.
Town of Alton	**Vulnerabilities:** The Town of Alton's residents, local water supply, nearby rangelands, agricultural uses, livestock operations, and surrounding vegetation are exposed to drought conditions that reduce soil moisture, snowpack-driven runoff, groundwater recharge, and spring or small-system reliability. The town's rural setting increases vulnerability where households, public services, and agricultural activity depend on limited local water sources. **Impacts:** Potential impacts include increased water conservation needs, reduced water availability for domestic and community use, stress on nearby grazing and agricultural operations, higher costs for livestock feed or water, degraded vegetation, increased dust, and elevated wildfire potential near the community. Planning considerations include community and public-service facilities, local water and utility systems, roads, and drainage crossings. Water shortages can constrain facility operations, fire suppression, and service

Plan Participant	Vulnerabilities and Impacts
	continuity; transportation effects are generally indirect. These are potential consequences, not a mapped exposure count.
Town of Big Water	**Vulnerabilities:** The Town of Big Water's residents, local water supply, visitor-serving activity, recreation access, and surrounding arid landscapes are exposed to drought because the community is located in an already dry setting where prolonged moisture deficits can further reduce water availability and stress vegetation. Recreation- and tourism-related activity tied to Lake Powell and surrounding landscapes is vulnerable when drought affects water levels, visual resources, and outdoor conditions. **Impacts:** Drought could increase pressure on local water supplies, affect landscaping and dust control, reduce recreation quality or visitor activity, stress surrounding vegetation and habitat, increase wildfire potential, and create economic impacts for visitor-serving businesses if drought reduces recreation opportunities or landscape conditions. Planning considerations include public-service and visitor-serving facilities, water and utility systems, roads, and recreation access routes. Water shortages can constrain facility operations, fire suppression, and service continuity; transportation effects are generally indirect. These are potential consequences, not a mapped exposure count.
Town of Glendale	**Vulnerabilities:** The Town of Glendale's residents, local water systems, nearby agricultural and ranching uses, rangelands, and natural vegetation are exposed to drought conditions that reduce soil moisture, streamflow, forage availability, and groundwater or spring-fed supplies. The town's rural and agricultural setting increases vulnerability where community water needs and surrounding agricultural activity rely on reliable seasonal moisture and local water sources. **Impacts:** Potential impacts include reduced water availability for domestic use, irrigation, livestock watering, and fire suppression; reduced forage and crop productivity; increased operating costs for agricultural producers; stressed vegetation and habitat; increased dust; and elevated wildfire risk. Planning considerations include public-service facilities, water and utility systems, roads, bridges, culverts, and agricultural access routes. Water shortages can constrain facility operations, fire suppression, and service continuity; transportation effects are generally indirect. These are potential consequences, not a mapped exposure count.
City of Kanab	**Vulnerabilities:** The City of Kanab contains the county's largest concentration of residents, homes, businesses, public facilities, visitor services, and municipal water demand. Because drought affects drinking water supplies, landscaping demand, fire suppression capacity, tourism landscapes, and nearby rangelands and watersheds, the City of Kanab has increased exposure where population, services, and visitor-serving activity depend on reliable water availability. **Impacts:** Drought affecting the City of Kanab could increase municipal water conservation needs, strain local water supply and delivery systems, increase

Plan Participant	Vulnerabilities and Impacts
	costs for water management, stress public landscaping and vegetation, reduce water available for fire suppression or community uses, increase dust and wildfire potential, and affect businesses and tourism activity connected to outdoor recreation and scenic landscapes. Planning considerations include Kane County Hospital, schools, government and emergency-service buildings, water and utility systems, roads, and drainage infrastructure. Water shortages can constrain facility operations, fire suppression, and service continuity; transportation effects are generally indirect. These are potential consequences, not a mapped exposure count.
Town of Orderville	**Vulnerabilities:** The Town of Orderville's residents, local water supply, nearby agricultural and ranching operations, rangelands, vegetation, and visitor-serving uses are exposed to drought conditions that reduce soil moisture, streamflow, spring or groundwater reliability, and forage availability. The town's agricultural and rural setting increases vulnerability where homes, community services, livestock operations, and surrounding lands depend on reliable seasonal runoff and local water sources. **Impacts:** Potential impacts include increased water conservation needs, reduced water availability for domestic use, irrigation, livestock watering, and fire suppression; reduced forage quality and agricultural productivity; higher feed or water costs for producers; stressed vegetation and habitat; increased dust; elevated wildfire potential; and disruption to residents, businesses, agriculture, and visitor travel. Planning considerations include public-service facilities, water and utility systems, roads, bridges, culverts, and visitor-access routes. Water shortages can constrain facility operations, fire suppression, and service continuity; transportation effects are generally indirect. These are potential consequences, not a mapped exposure count.

Earthquake

Table 137 summarizes earthquake vulnerabilities and potential impacts for Kane County participants.

Table 137: Earthquake Vulnerability and Impact Assessment for Kane County

Plan Participant	Vulnerabilities and Impacts
Unincorporated Kane County	**Vulnerabilities:** Unincorporated Kane County is exposed to earthquake ground shaking across a broad area. Dispersed residences, public facilities, roads, bridges, utilities, communication systems, water and wastewater systems, historic or older structures, recreation areas, and rural access routes are vulnerable to shaking, ground failure, rockfall, landslides, and lifeline disruption. Limited redundancy in rural transportation and utility networks increases vulnerability where roads, bridges, or utility systems provide the primary access or service connection.

Plan Participant	Vulnerabilities and Impacts
	Impacts: Earthquakes could cause structural and nonstructural building damage, injuries from falling objects or damaged buildings, disruption to roads and bridges, interruption of power, water, wastewater, gas, and communications systems, delayed emergency response, damage to historic or cultural resources, slope failures or rockfall in steep terrain, and prolonged disruption to rural residents, recreation access, utilities, and countywide services. Planning considerations include county government and emergency-response facilities, water and communications systems, rural roads, bridges, culverts, and recreation access routes. Shaking, utility damage, and blocked access can interrupt essential services. These are potential consequences, not a mapped exposure count.
Town of Alton	**Vulnerabilities:** The Town of Alton's residents, homes, local roads, utilities, community facilities, and nearby slopes or canyon-influenced terrain are exposed to earthquake ground shaking. Older buildings, lightly constructed structures, utility lines, and limited local access routes are vulnerable to shaking damage, falling contents, service interruption, and secondary hazards such as rockfall or slope instability where susceptible terrain exists. **Impacts:** Potential impacts include damage to homes, public buildings, utilities, roads, and bridges; injuries from falling objects or damaged structures; disruption of power, water, wastewater, gas, and communications services; reduced access for emergency response; and temporary interruption of community services and daily activities. Planning considerations include community and public-service facilities, local water and utility systems, roads, and drainage crossings. Shaking, utility damage, and blocked access can interrupt essential services. These are potential consequences, not a mapped exposure count.
Town of Big Water	**Vulnerabilities:** The Town of Big Water's residents, structures, roads, utilities, recreation-related facilities, and visitor-serving activity are exposed to earthquake ground shaking that can extend across Kane County from regional seismic sources. Buildings, utility systems, transportation links, and facilities supporting residents and visitors are vulnerable to structural damage, nonstructural damage, service interruption, and access disruption. **Impacts:** Earthquakes could damage homes, businesses, public facilities, roads, utilities, and recreation-related infrastructure; interrupt power, water, wastewater, gas, and communications systems; create safety risks for residents and visitors; disrupt travel and emergency access; and affect visitor services and recreation activity. Planning considerations include public-service and visitor-serving facilities, water and utility systems, roads, and recreation access routes. Shaking, utility damage, and blocked access can interrupt essential services. These are potential consequences, not a mapped exposure count.
Town of Glendale	**Vulnerabilities:** The Town of Glendale's residents, homes, local roads, bridges, utilities, public facilities, agricultural or ranching structures, and nearby steep or drainage-adjacent terrain are exposed to earthquake ground

Plan Participant	Vulnerabilities and Impacts
	shaking. Older buildings, unreinforced or lightly constructed structures, overhead or buried utilities, and limited access routes are vulnerable to shaking damage, ground failure, rockfall, slope instability, and lifeline disruption. **Impacts:** Potential impacts include structural and nonstructural building damage, damage to roads, bridges, utilities, and public facilities, injuries from falling objects or damaged structures, interruption of water, wastewater, power, gas, and communications services, delayed emergency response, and disruption to residents, agriculture, and community operations. Planning considerations include public-service facilities, water and utility systems, roads, bridges, culverts, and agricultural access routes. Shaking, utility damage, and blocked access can interrupt essential services. These are potential consequences, not a mapped exposure count.
City of Kanab	**Vulnerabilities:** The City of Kanab contains the county's largest concentration of residents, homes, businesses, schools, public buildings, utilities, roads, community services, and visitor-serving activity. The City of Kanab is exposed to earthquake ground shaking, and its concentration of people, structures, utilities, and services increases vulnerability to structural damage, nonstructural damage, lifeline disruption, and interruptions to government, emergency, school, business, and tourism functions. The earthquake profile also identifies Kane County schools with unreinforced masonry or likely unreinforced masonry, including Kanab School, which increases vulnerability for school facilities if not retrofitted or replaced. **Impacts:** Earthquakes affecting the City of Kanab could cause injuries, structural and nonstructural damage to homes, businesses, schools, public buildings, and historic or older structures; interruption of power, water, wastewater, gas, and communications systems; disruption to roads and emergency services; temporary closure of schools or public facilities; business interruption; and economic impacts to tourism and community activity. Planning considerations include Kane County Hospital, schools, government and emergency-service buildings, water and utility systems, roads, and drainage infrastructure. Shaking, utility damage, and blocked access can interrupt essential services. These are potential consequences, not a mapped exposure count.
Town of Orderville	**Vulnerabilities:** The Town of Orderville's residents, homes, local roads, utilities, public facilities, nearby agricultural or ranching structures, and visitor-serving uses are exposed to earthquake ground shaking. Older buildings, lightly constructed structures, utility systems, roads, bridges, and nearby steep or canyon-influenced terrain are vulnerable to structural damage, nonstructural damage, ground failure, rockfall, slope instability, and service interruption. **Impacts:** Potential impacts include damage to homes, public buildings, roads, bridges, utilities, and agricultural or visitor-serving structures; injuries from falling objects or damaged buildings; interruption of power, water, wastewater, gas, and communications systems; delayed emergency response;

Plan Participant	Vulnerabilities and Impacts
	disruption to residents, businesses, agriculture, and visitor travel; and temporary interruption of community services. Planning considerations include public-service facilities, water and utility systems, roads, bridges, culverts, and visitor-access routes. Shaking, utility damage, and blocked access can interrupt essential services. These are potential consequences, not a mapped exposure count.

Extreme Heat

Table 138 summarizes extreme heat vulnerabilities and potential impacts for Kane County participants.

Table 138: Extreme Heat Vulnerability and Impact Assessment for Kane County

Plan Participant	Vulnerabilities and Impacts
Unincorporated Kane County	**Vulnerabilities:** Unincorporated Kane County includes dispersed residences, recreation areas, trailheads, parks, agricultural and ranching lands, transportation routes, and remote areas where residents, outdoor workers, visitors, and recreation users are exposed to high summer temperatures. Kane County is projected to experience more extreme heat days than most counties in the region, and remote recreation areas increase vulnerability where people may have limited shade, water, cell service, or access to emergency medical assistance. Older adults, people with chronic health conditions, outdoor workers, agricultural workers, visitors unfamiliar with local conditions, and people without reliable cooling are especially vulnerable. **Impacts:** Extreme heat could cause dehydration, heat exhaustion, heat stroke, hospitalization, or death; increase demand for emergency medical response and public health services; stress livestock, crops, vegetation, and water resources; increase energy and water demand; worsen drought and wildfire conditions; disrupt outdoor work, recreation, tourism, community events, and travel in remote areas; and increase risks for visitors at destinations such as The Wave, Buckskin Gulch, Coral Pink Sand Dunes, Lake Powell, and other outdoor recreation areas. Planning considerations include county government and emergency-response facilities, water and communications systems, rural roads, bridges, culverts, and recreation access routes. Heat can increase medical demand, cooling and water loads, and stress on utility and outdoor operations. These are potential consequences, not a mapped exposure count.
Town of Alton	**Vulnerabilities:** The Town of Alton's residents, older adults, outdoor workers, agricultural and ranching activity, homes without reliable cooling, local roads, and surrounding recreation or open-space areas are exposed to extreme heat during summer months. The town's rural setting increases vulnerability where residents and visitors may have limited access to cooling resources, nearby medical care, or rapid emergency response during prolonged heat.

Plan Participant	Vulnerabilities and Impacts
	Impacts: Potential impacts include heat-related illness among residents, workers, and visitors; increased demand for cooling, hydration, and medical assistance; stress on livestock, gardens, vegetation, and local water supplies; higher energy or water use; reduced outdoor activity; delays in outdoor work; and increased wildfire potential during hot, dry periods. Planning considerations include community and public-service facilities, local water and utility systems, roads, and drainage crossings. Heat can increase medical demand, cooling and water loads, and stress on utility and outdoor operations. These are potential consequences, not a mapped exposure count.
Town of Big Water	**Vulnerabilities:** The Town of Big Water is vulnerable to extreme heat in its arid, lower-elevation setting. Residents, visitors, recreation users, outdoor workers, local businesses, water systems, and recreation-related activity near Lake Powell and Glen Canyon are exposed to prolonged heat, warm overnight temperatures, and limited shade in the surrounding arid landscape. Visitors unfamiliar with local heat conditions and people recreating near Lake Powell are especially vulnerable when heat coincides with limited water, shade, or emergency access. **Impacts:** Extreme heat could cause heat-related illness or death among residents, visitors, and recreation users; increase demand for emergency response and medical care; strain local water and energy use; reduce outdoor recreation activity or visitor comfort; affect visitor-serving businesses; stress vegetation and water resources; and increase wildfire and drought-related impacts. Planning considerations include public-service and visitor-serving facilities, water and utility systems, roads, and recreation access routes. Heat can increase medical demand, cooling and water loads, and stress on utility and outdoor operations. These are potential consequences, not a mapped exposure count.
Town of Glendale	**Vulnerabilities:** The Town of Glendale's residents, older adults, outdoor workers, agricultural and ranching activity, homes without reliable cooling, local roads, and nearby recreation areas are exposed to high summer temperatures. The town's rural and agricultural setting increases vulnerability where residents, workers, livestock, and visitors depend on adequate water, shade, cooling, and timely emergency response during prolonged heat. **Impacts:** Potential impacts include heat-related illness, increased demand for cooling and medical assistance, stress on livestock and vegetation, increased irrigation or water demand, reduced productivity for outdoor work, disruptions to recreation and community activities, and elevated drought and wildfire potential during hot, dry conditions. Planning considerations include public-service facilities, water and utility systems, roads, bridges, culverts, and agricultural access routes. Heat can increase medical demand, cooling and water loads, and stress on utility and outdoor operations. These are potential consequences, not a mapped exposure count.
City of Kanab	**Vulnerabilities:** The City of Kanab contains the county's largest concentration of residents, older adults, homes, businesses, public facilities, visitor services,

Plan Participant	Vulnerabilities and Impacts
	outdoor workers, and municipal water and energy demand. The City of Kanab is especially vulnerable where population, public services, tourism activity, outdoor recreation access, and heat-sensitive groups are concentrated. **Impacts:** Extreme heat affecting the City of Kanab could increase heat-related illness among residents, outdoor workers, older adults, and visitors; increase demand for emergency medical services, cooling resources, water, and electricity; strain public facilities and utilities; reduce outdoor recreation and tourism activity during the hottest periods; increase operating costs for businesses and public services; stress landscaping and vegetation; and worsen drought, wildfire, and air quality conditions. Planning considerations include Kane County Hospital, schools, government and emergency-service buildings, water and utility systems, roads, and drainage infrastructure. Heat can increase medical demand, cooling and water loads, and stress on utility and outdoor operations. These are potential consequences, not a mapped exposure count.
Town of Orderville	**Vulnerabilities:** The Town of Orderville's residents, older adults, homes, outdoor workers, agricultural and ranching activity, local roads, nearby recreation access, and visitor-serving uses are exposed to high summer temperatures. The town's rural setting increases vulnerability where residents, visitors, workers, and livestock rely on adequate water, shade, cooling, and emergency access during heat events. **Impacts:** Potential impacts include heat-related illness among residents, workers, and visitors; increased cooling and water demand; stress on livestock, crops, gardens, and vegetation; reduced outdoor work productivity; disruptions to recreation, travel, and community activities; increased demand for emergency response or medical assistance; and elevated drought and wildfire potential during hot, dry periods. Planning considerations include public-service facilities, water and utility systems, roads, bridges, culverts, and visitor-access routes. Heat can increase medical demand, cooling and water loads, and stress on utility and outdoor operations. These are potential consequences, not a mapped exposure count.

Flooding

Table 139 summarizes flooding vulnerabilities and potential impacts for Kane County participants.

Table 139: Flooding Vulnerability and Impact Assessment for Kane County

Plan Participant	Vulnerabilities and Impacts
Unincorporated Kane County	**Vulnerabilities:** Unincorporated Kane County includes numerous flood-prone canyons, washes, slot canyons, dry washes, alluvial fans, roadway crossings, recreation areas, agricultural lands, dispersed residences, utilities, and rural access routes that are exposed to flooding and flash flooding. Flood risk is

Plan Participant	Vulnerabilities and Impacts
	significant across Kane County because intense rainfall can produce rapid water level rises and debris-laden flows in narrow canyons and drainage systems, including areas outside mapped Special Flood Hazard Areas. Residents, visitors, hikers, travelers, agricultural assets, roads, culverts, bridges, and utilities are vulnerable where they are located in or near washes, canyon mouths, low-water crossings, floodplains, or downstream of burn scars. **Impacts:** Flooding could cause injury or loss of life, damage to homes, businesses, roads, bridges, culverts, utilities, agricultural lands, and recreation assets; wash out or block roads; isolate rural residents or visitors; delay emergency response; damage natural, historic, and cultural resources; disrupt tourism and outdoor recreation; and create long-term recovery needs where erosion, sediment deposition, or debris flows damage infrastructure and access routes. Planning considerations include county government and emergency-response facilities, water and communications systems, rural roads, bridges, culverts, and recreation access routes. Floodwater, erosion, and debris can damage facilities, utilities, and crossings or restrict access where assets intersect flood-prone areas. These are potential consequences, not a mapped exposure count.
Town of Alton	**Vulnerabilities:** The Town of Alton's residents, homes, local roads, bridges, culverts, utilities, community facilities, agricultural and ranching lands, and surrounding drainage corridors are exposed to flooding from intense rainfall, snowmelt runoff, and flash flooding in normally dry washes and low-lying areas. The town's rural setting increases vulnerability where limited access routes, low-water crossings, and drainage infrastructure can be damaged or overtopped during localized flood events. **Impacts:** Potential impacts include localized flooding of structures and roads, damage to culverts, crossings, utilities, agricultural lands, and outbuildings, road closures, erosion and sediment deposition, delayed emergency response, temporary isolation of residents or travelers, and disruption to community services and agricultural operations. Planning considerations include community and public-service facilities, local water and utility systems, roads, and drainage crossings. Floodwater, erosion, and debris can damage facilities, utilities, and crossings or restrict access where assets intersect flood-prone areas. These are potential consequences, not a mapped exposure count.
Town of Big Water	**Vulnerabilities:** The Town of Big Water's residents, structures, roads, utilities, visitor-serving facilities, recreation access, and low-lying or drainage-adjacent areas are exposed to flooding and flash flooding associated with intense rainfall, dry washes, and nearby recreation landscapes tied to Glen Canyon and Lake Powell. Visitors and recreation users are vulnerable where storms produce rapid runoff, debris flows, or hazardous road and trail conditions with limited warning. **Impacts:** Flooding could damage homes, businesses, public facilities, roads, culverts, utilities, and recreation-related infrastructure; reduce access to Lake Powell and surrounding recreation areas; strand residents, travelers, or

Plan Participant	Vulnerabilities and Impacts
	visitors; disrupt emergency response, utilities, and visitor services; and create safety risks from fast-moving water, debris, erosion, and reduced road access. Planning considerations include public-service and visitor-serving facilities, water and utility systems, roads, and recreation access routes. Floodwater, erosion, and debris can damage facilities, utilities, and crossings or restrict access where assets intersect flood-prone areas. These are potential consequences, not a mapped exposure count.
Town of Glendale	**Vulnerabilities:** The Town of Glendale's residents, homes, local roads, bridges, culverts, utilities, public facilities, agricultural or ranching lands, and drainage-adjacent areas are exposed to flooding from intense rainfall, runoff in dry washes, and flash flooding in canyon-influenced terrain. Structures, roads, utility lines, and agricultural assets are vulnerable where they intersect flood-prone drainages, alluvial fans, low-water crossings, or areas where stormwater capacity can be exceeded. **Impacts:** Potential impacts include flooding of homes and public facilities, damage to roads, bridges, culverts, utilities, fences, fields, and outbuildings, erosion and sediment deposition, blocked or washed-out access routes, delayed emergency response, disruption to residents and agriculture, and increased cleanup and repair costs. Planning considerations include public-service facilities, water and utility systems, roads, bridges, culverts, and agricultural access routes. Floodwater, erosion, and debris can damage facilities, utilities, and crossings or restrict access where assets intersect flood-prone areas. These are potential consequences, not a mapped exposure count.
City of Kanab	**Vulnerabilities:** The City of Kanab contains the county's largest concentration of residents, homes, businesses, schools, public buildings, roads, utilities, emergency services, visitor services, and community facilities. The City of Kanab is exposed to flooding and flash flooding where developed areas, transportation routes, drainage systems, washes, and low-lying areas receive rapid runoff from intense rainfall. The 2023 flash flood event in Kanab that caused property damage demonstrates that localized flash flooding can affect developed areas and community infrastructure.[221] **Impacts:** Flooding affecting the City of Kanab could damage homes, businesses, schools, public facilities, roads, culverts, drainage systems, utilities, and vehicles; create public safety risks from fast-moving water and debris; disrupt emergency response, government services, schools, businesses, and visitor services; cause road closures or localized access issues; and produce economic impacts from property damage, cleanup, business interruption, and tourism disruption. Planning considerations include Kane County Hospital, schools, government and emergency-service buildings, water and utility systems, roads, and drainage infrastructure. Floodwater, erosion, and debris

[221] NOAA National Centers for Environmental Information, Storm Events Database, annual details CSV files, retrieved October 10, 2026. https://www.ncei.noaa.gov/pub/data/swdi/stormevents/csvfiles/ Event 1131415, September 13, 2023, Kanab flash flooding: streets closed, roads covered by mud/debris, and minor basement flooding reported.

Plan Participant	Vulnerabilities and Impacts
	can damage facilities, utilities, and crossings or restrict access where assets intersect flood-prone areas. These are potential consequences, not a mapped exposure count.
Town of Orderville	**Vulnerabilities:** The Town of Orderville's residents, homes, local roads, bridges, culverts, utilities, public facilities, agricultural or ranching lands, nearby recreation access, and drainage corridors are exposed to flooding from intense rainfall, snowmelt runoff, and flash flooding in washes and canyon-influenced terrain. The town's rural setting increases vulnerability where roads, crossings, drainage infrastructure, and utility systems provide limited redundancy for access and service continuity. **Impacts:** Potential impacts include localized flooding of structures and roads, damage to culverts, bridges, crossings, utilities, agricultural lands, fences, and outbuildings, erosion and sediment deposition, blocked or washed-out roads, delayed emergency response, temporary isolation of residents or travelers, disruption to community services, agriculture, and visitor travel, and increased cleanup and repair costs. Planning considerations include public-service facilities, water and utility systems, roads, bridges, culverts, and visitor-access routes. Floodwater, erosion, and debris can damage facilities, utilities, and crossings or restrict access where assets intersect flood-prone areas. These are potential consequences, not a mapped exposure count.

Hail

Table 140 summarizes hail vulnerabilities and potential impacts for Kane County participants.

Table 140: Hail Vulnerability and Impact Assessment for Kane County

Plan Participant	Vulnerabilities and Impacts
Unincorporated Kane County	**Vulnerabilities:** Unincorporated Kane County includes dispersed residences, public facilities, roads, utility infrastructure, agricultural and ranching operations, vehicles, visitor-serving facilities, campgrounds, trailheads, outdoor recreation infrastructure, and other exposed assets that are vulnerable to hail. Although Kane County has the lowest relative hail risk among the five counties, documented hail events, including severe hail in the Glen Canyon area, show that damaging hail can occur. The county's dispersed development, long travel distances, outdoor recreation activity, and limited local repair capacity increase vulnerability where hail damages roofs, vehicles, utility equipment, signs, solar equipment, agricultural assets, or recreation facilities. **Impacts:** Hail could damage roofs, siding, windows, skylights, vehicles, solar equipment, HVAC[222] units, signage, public facilities, agricultural equipment,

[222] HVAC = heating, ventilation, and air conditioning

Plan Participant	Vulnerabilities and Impacts
	fencing, forage, and outdoor recreation infrastructure; create hazardous travel conditions; injure people or livestock caught outdoors; disrupt tourism, transportation, utilities, public services, and emergency response; and increase repair, insurance, and recovery costs for residents, businesses, agricultural producers, and public agencies. Planning considerations include county government and emergency-response facilities, water and communications systems, rural roads, bridges, culverts, and recreation access routes. Roof and equipment damage, vehicle damage, and hazardous travel can interrupt services. These are potential consequences, not a mapped exposure count.
Town of Alton	**Vulnerabilities:** The Town of Alton's residents, homes, local roads, public facilities, utilities, agricultural and ranching assets, vehicles, fences, sheds, outdoor equipment, and livestock facilities are exposed to hail produced by localized spring and summer thunderstorms. The town's rural setting increases vulnerability where residents, agricultural producers, and public services depend on exposed structures, vehicles, and equipment and where repair or replacement resources may be limited. **Impacts:** Potential impacts include damage to roofs, siding, windows, vehicles, sheds, fences, livestock facilities, agricultural equipment, and utility assets; injury to people or animals outdoors; hazardous driving conditions; localized service interruption; increased maintenance and repair costs; and temporary disruption to residents, agriculture, and community operations. Planning considerations include community and public-service facilities, local water and utility systems, roads, and drainage crossings. Roof and equipment damage, vehicle damage, and hazardous travel can interrupt services. These are potential consequences, not a mapped exposure count.
Town of Big Water	**Vulnerabilities:** The Town of Big Water's residents, homes, businesses, roads, vehicles, utilities, visitor-serving facilities, campgrounds, recreation access, signage, solar equipment, and outdoor infrastructure are exposed to hail from isolated thunderstorms in the Lake Powell and Glen Canyon area. Visitor-serving assets and recreation-related facilities are vulnerable because hail can damage vehicles, roofs, outdoor equipment, and facilities used by residents and travelers. **Impacts:** Hail could damage homes, businesses, vehicles, roofs, windows, signs, solar equipment, utilities, campgrounds, and recreation-related infrastructure; create hazardous travel conditions; injure residents, visitors, or recreation users caught outdoors; disrupt visitor services and recreation access; and increase repair costs for property owners, businesses, and public agencies. Planning considerations include public-service and visitor-serving facilities, water and utility systems, roads, and recreation access routes. Roof and equipment damage, vehicle damage, and hazardous travel can interrupt services. These are potential consequences, not a mapped exposure count.
Town of Glendale	**Vulnerabilities:** The Town of Glendale's residents, homes, public facilities, local roads, utilities, agricultural and ranching assets, vehicles, sheds, fencing,

Plan Participant	Vulnerabilities and Impacts
	livestock facilities, and outdoor equipment are exposed to hail from localized thunderstorms. Agricultural and rural assets are vulnerable where hail damages forage, fencing, outbuildings, vehicles, roofs, and exposed equipment during the growing and recreation seasons. **Impacts:** Potential impacts include roof, siding, window, vehicle, fence, shed, and equipment damage; losses to forage or agricultural production; injury to livestock or people caught outdoors; hazardous road conditions; localized utility or service disruptions; increased repair costs; and temporary disruption to residents, agriculture, and community activity. Planning considerations include public-service facilities, water and utility systems, roads, bridges, culverts, and agricultural access routes. Roof and equipment damage, vehicle damage, and hazardous travel can interrupt services. These are potential consequences, not a mapped exposure count.
City of Kanab	**Vulnerabilities:** The City of Kanab contains the county's largest concentration of residents, homes, businesses, schools, public buildings, emergency service facilities, utilities, vehicles, visitor-serving businesses, and community infrastructure. This concentration increases vulnerability to hail because a localized storm affecting the city could damage many structures, vehicles, roofs, windows, signs, solar equipment, HVAC units, public facilities, and business assets at once. The city's role as a visitor-serving hub also increases vulnerability where lodging, restaurants, visitor services, and transportation access support tourism activity. **Impacts:** Hail affecting the City of Kanab could damage homes, businesses, schools, public buildings, roofs, windows, vehicles, signage, solar equipment, HVAC units, utilities, and outdoor public assets; injure people caught outdoors; disrupt traffic, emergency response, government services, schools, businesses, tourism activity, and public operations; and generate repair costs, insurance claims, business interruption, and short-term service disruptions. Planning considerations include Kane County Hospital, schools, government and emergency-service buildings, water and utility systems, roads, and drainage infrastructure. Roof and equipment damage, vehicle damage, and hazardous travel can interrupt services. These are potential consequences, not a mapped exposure count.
Town of Orderville	**Vulnerabilities:** The Town of Orderville's residents, homes, local roads, utilities, public facilities, agricultural and ranching operations, visitor-serving uses, vehicles, fences, sheds, livestock facilities, and outdoor equipment are exposed to hail from localized spring and summer thunderstorms. Rural development patterns and reliance on exposed agricultural, transportation, and visitor-serving assets increase vulnerability where hail damages roofs, vehicles, forage, equipment, or facilities that support residents, producers, and travelers. **Impacts:** Potential impacts include damage to roofs, siding, windows, vehicles, fences, sheds, livestock facilities, agricultural equipment, utilities, signs, and outdoor recreation or visitor-serving assets; injury to people or animals outdoors; hazardous driving conditions; localized service interruption;

Plan Participant	Vulnerabilities and Impacts
	increased repair and replacement costs; and disruption to residents, agriculture, businesses, and visitor travel. Planning considerations include public-service facilities, water and utility systems, roads, bridges, culverts, and visitor-access routes. Roof and equipment damage, vehicle damage, and hazardous travel can interrupt services. These are potential consequences, not a mapped exposure count.

Landslide

Table 141 summarizes landslide vulnerabilities and potential impacts for Kane County participants.

Table 141: Landslide Vulnerability and Impact Assessment for Kane County

Plan Participant	Vulnerabilities and Impacts
Unincorporated Kane County	**Vulnerabilities:** Unincorporated Kane County contains steep cliffs, narrow canyons, weak sedimentary rock, alluvial fan and drainage settings, highway corridors, local access roads, bridges, culverts, utility lines, recreation sites, visitor-serving facilities, dispersed residences, and public lands that are exposed to landslides, rockfall, debris flows, and slope failure. The county's vulnerability is highest where U.S. 89, SR-9, SR-12 approaches, local canyon roads, visitor access roads, utilities, and recreation facilities intersect steep or unstable terrain. The Meadow Creek landslide along SR-9 demonstrates that active slope movement in Kane County can damage a major tourism and community access corridor.[223] **Impacts:** Landslides could damage or close roads, bridges, culverts, utilities, recreation access routes, visitor facilities, homes, public facilities, and drainage systems; delay emergency response and utility restoration; isolate residents or visitors; disrupt access to Zion National Park, Grand Staircase-Escalante, Glen Canyon, Coral Pink Sand Dunes, and other recreation destinations; increase debris removal, slope stabilization, roadway repair, and utility restoration costs; and create cascading impacts such as erosion, sedimentation, localized flooding, and longer travel detours. Planning considerations include county government and emergency-response facilities, water and communications systems, rural roads, bridges, culverts, and recreation access routes. Damage is possible where facilities or access routes intersect unstable slopes, rockfall paths, or debris-flow areas. These are potential consequences, not a mapped exposure count.
Town of Alton	**Vulnerabilities:** The Town of Alton's residents, homes, local roads, utilities, community facilities, agricultural or ranching access routes, and surrounding steep or drainage-influenced terrain are exposed to landslides, rockfall, debris

[223] Utah Geological Survey, Meadow Creek Landslide, Kane County, updated June 7, 2023. https://geology.utah.gov/portfolio-item/meadow-creek-landslide/. Source for the documented SR-9 landslide, not for mapped exposure of all assets listed.

Plan Participant	Vulnerabilities and Impacts
	flows, and slope instability where roads, drainage crossings, and developed areas intersect unstable slopes or post-wildfire runoff areas. The town's rural setting increases vulnerability where limited access routes and utility connections provide the primary connection for residents, emergency services, and public works. **Impacts:** Potential impacts include damage to roads, culverts, drainage crossings, utilities, homes, outbuildings, and public facilities; blocked access routes; delayed emergency response; temporary isolation of residents or travelers; increased debris removal and repair costs; disruption to agricultural or ranching access; and localized erosion, sedimentation, or drainage problems following slope failure. Planning considerations include community and public-service facilities, local water and utility systems, roads, and drainage crossings. Damage is possible where facilities or access routes intersect unstable slopes, rockfall paths, or debris-flow areas. These are potential consequences, not a mapped exposure count.
Town of Big Water	**Vulnerabilities:** The Town of Big Water's residents, homes, businesses, roads, utilities, visitor-serving facilities, recreation access routes, and surrounding canyon, mesa, slope, and drainage settings are exposed to landslides, rockfall, debris flows, and slope instability. Access to Lake Powell, Glen Canyon, and surrounding recreation areas increases vulnerability where visitors, roadways, utilities, and tourism-related facilities depend on stable slopes and reliable access through arid, erosion-prone terrain. **Impacts:** Landslides could damage roads, utilities, homes, businesses, visitor facilities, recreation access routes, drainage systems, and outdoor infrastructure; disrupt access to Lake Powell and Glen Canyon recreation areas; delay emergency response or utility restoration; strand residents, travelers, or visitors; increase roadway repair, debris removal, and stabilization costs; and affect tourism activity and visitor services. Planning considerations include public-service and visitor-serving facilities, water and utility systems, roads, and recreation access routes. Damage is possible where facilities or access routes intersect unstable slopes, rockfall paths, or debris-flow areas. These are potential consequences, not a mapped exposure count.
Town of Glendale	**Vulnerabilities:** The Town of Glendale's residents, homes, local roads, utilities, public facilities, agricultural or ranching lands, drainage corridors, and canyon-influenced terrain are exposed to landslides, rockfall, debris flows, and slope instability. The town is vulnerable where roads, bridges, culverts, utility lines, homes, outbuildings, and agricultural access routes intersect steep slopes, unstable drainages, alluvial fan areas, or areas affected by intense rainfall, rapid snowmelt, erosion, or post-wildfire runoff. **Impacts:** Potential impacts include damage to homes, roads, bridges, culverts, utilities, fences, fields, outbuildings, and drainage systems; blocked or damaged access routes; delayed emergency response; disruption to residents and agricultural operations; erosion and sediment deposition; increased maintenance, debris removal, and repair costs; and temporary isolation of residents, workers, or travelers. Planning considerations include

Plan Participant	Vulnerabilities and Impacts
	public-service facilities, water and utility systems, roads, bridges, culverts, and agricultural access routes. Damage is possible where facilities or access routes intersect unstable slopes, rockfall paths, or debris-flow areas. These are potential consequences, not a mapped exposure count.
City of Kanab	**Vulnerabilities:** The City of Kanab contains the county's largest concentration of residents, homes, businesses, schools, public buildings, emergency services, utilities, roads, visitor services, and community facilities. The City of Kanab is vulnerable to landslide-related impacts where developed areas, access routes, drainage systems, utility corridors, and nearby canyon or slope settings intersect unstable slopes, alluvial fan areas, erosion-prone drainages, or post-wildfire runoff areas. The city's role as a county service center and visitor gateway increases vulnerability because disruptions to roads, utilities, and public services can affect both residents and regional tourism activity. **Impacts:** Landslides affecting the City of Kanab could damage roads, utilities, drainage systems, homes, businesses, schools, public buildings, visitor facilities, and community infrastructure; disrupt emergency response, government services, schools, businesses, and tourism activity; increase repair, debris removal, slope stabilization, and utility restoration costs; create localized flooding, erosion, or sedimentation problems; and produce economic impacts from business interruption, access disruption, and reduced visitor movement. Planning considerations include Kane County Hospital, schools, government and emergency-service buildings, water and utility systems, roads, and drainage infrastructure. Damage is possible where facilities or access routes intersect unstable slopes, rockfall paths, or debris-flow areas. These are potential consequences, not a mapped exposure count.
Town of Orderville	**Vulnerabilities:** The Town of Orderville's residents, homes, local roads, utilities, public facilities, agricultural or ranching operations, visitor-serving uses, drainage corridors, and nearby canyon or steep-slope terrain are exposed to landslides, rockfall, debris flows, and slope instability. The town's location along important travel and visitor access routes increases vulnerability where roads, bridges, culverts, utility lines, homes, agricultural access, and visitor services depend on stable slopes and reliable transportation connections. **Impacts:** Potential impacts include damage to homes, public facilities, roads, bridges, culverts, utilities, agricultural or ranching assets, visitor-serving facilities, and drainage systems; blocked or damaged access routes; delayed emergency response; temporary isolation of residents or travelers; disruption to agriculture, businesses, and visitor travel; increased debris removal, roadway repair, utility restoration, and slope stabilization costs; and localized erosion, sedimentation, or drainage impacts. Planning considerations include public-service facilities, water and utility systems, roads, bridges, culverts, and visitor-access routes. Damage is possible where facilities or access routes intersect unstable slopes, rockfall paths, or debris-flow areas. These are potential consequences, not a mapped exposure count.

Problem Soils

Table 142 summarizes problem soils vulnerabilities and potential impacts for Kane County participants.

Table 142: Problem Soils Vulnerability and Impact Assessment for Kane County

Plan Participant	Vulnerabilities and Impacts
Unincorporated Kane County	**Vulnerabilities:** Unincorporated Kane County includes valley-floor development, dispersed residences, roads, bridge approaches, culverts, water and wastewater systems, septic systems, utility corridors, agricultural lands, campgrounds, park access roads, visitor-serving facilities, and public service locations that are exposed to expansive, saline, gypsiferous, shallow, rocky, erodible, and locally collapsible soils. Problem soils are concentrated in valley floors, alluvial plains, agricultural areas, areas along Kanab Creek, plateau margins, and sedimentary formations east and north of Kanab. These soils are vulnerable to moisture changes from irrigation, stormwater infiltration, leaking utilities, intense rainfall, and wet-dry cycles, which can cause settlement, shrink-swell movement, erosion, corrosion, septic limitations, and loss of bearing capacity.[224] **Impacts:** Problem soils could damage foundations, slabs, pavements, sidewalks, bridge approaches, culverts, buried utilities, septic systems, drainage systems, park access roads, campgrounds, agricultural facilities, and visitor-serving infrastructure; increase road and utility maintenance needs; reduce agricultural productivity where saline or poorly drained soils occur; increase construction and repair costs; disrupt access to remote communities and recreation destinations; and create secondary impacts where leaking utilities or concentrated runoff worsen soil instability. Planning considerations include county government and emergency-response facilities, water and communications systems, rural roads, bridges, culverts, and recreation access routes. Settlement, soil movement, erosion, or corrosion can damage foundations, buried utilities, and road infrastructure where susceptible soils occur. These are potential consequences, not a mapped exposure count.
Town of Alton	**Vulnerabilities:** The Town of Alton's residents, homes, local roads, public facilities, utilities, septic systems, agricultural or ranching assets, and drainage features are exposed to problem soils where development and infrastructure intersect valley-bottom, alluvial, shallow, rocky, erodible, saline, or moisture-sensitive soils. The town's rural setting increases vulnerability where roads, utility lines, septic systems, homes, and agricultural support facilities rely on native soils that may settle, erode, corrode infrastructure, or lose strength when wetted. **Impacts:** Potential impacts include foundation or slab cracking, roadway settlement, pavement distress, culvert or shoulder damage, septic limitations,

[224] Utah Geological Survey, Problem Soil and Rock Hazards. https://geology.utah.gov/hazards/problem-soils/. Source for soil-hazard mechanisms and infrastructure consequences; participant-specific soil distributions require mapped or site-specific records.

Plan Participant	Vulnerabilities and Impacts
	pipe breaks, drainage problems, erosion, reduced agricultural productivity, higher maintenance and construction costs, and localized disruption to residents, utilities, agricultural operations, and public services. Planning considerations include community and public-service facilities, local water and utility systems, roads, and drainage crossings. Settlement, soil movement, erosion, or corrosion can damage foundations, buried utilities, and road infrastructure where susceptible soils occur. These are potential consequences, not a mapped exposure count.
Town of Big Water	**Vulnerabilities:** The Town of Big Water's residents, homes, businesses, roads, utilities, septic systems, visitor-serving facilities, recreation access routes, campgrounds, drainage systems, and surrounding arid landscapes are exposed to problem soils associated with alluvial, shallow, rocky, erodible, saline, and locally gypsiferous or collapsible materials. Visitor-serving and recreation-related assets are vulnerable where roads, buildings, utilities, and outdoor facilities depend on stable bearing conditions, adequate drainage, and reliable access across moisture-sensitive or erosion-prone soils. **Impacts:** Problem soils could cause foundation cracking, slab movement, roadway settlement, shoulder loss, culvert or drainage failure, septic system limitations, pipe breaks, utility interruption, erosion, higher site preparation and repair costs, reduced visitor access, damage to recreation-related facilities, and disruption to residents, businesses, utilities, and tourism activity. Planning considerations include public-service and visitor-serving facilities, water and utility systems, roads, and recreation access routes. Settlement, soil movement, erosion, or corrosion can damage foundations, buried utilities, and road infrastructure where susceptible soils occur. These are potential consequences, not a mapped exposure count.
Town of Glendale	**Vulnerabilities:** The Town of Glendale's residents, homes, local roads, public facilities, utilities, septic systems, agricultural or ranching lands, drainage corridors, and valley-community settings are exposed to expansive, saline, shallow, rocky, erodible, and locally collapsible soils. The town is vulnerable where homes, roads, bridge approaches, culverts, buried utilities, septic systems, outbuildings, and agricultural access routes intersect moisture-sensitive alluvial soils, drainage-limited soils, or soils affected by irrigation, runoff, leaking infrastructure, or wet-dry cycles. **Impacts:** Potential impacts include foundation cracking, slab or wall movement, pavement cracking, road shoulder loss, culvert instability, septic limitations, pipe breaks, drainage problems, erosion, reduced agricultural productivity, damage to outbuildings or equipment pads, increased maintenance and repair costs, and localized disruption to residents, agriculture, utilities, and public services. Planning considerations include public-service facilities, water and utility systems, roads, bridges, culverts, and agricultural access routes. Settlement, soil movement, erosion, or corrosion can damage foundations, buried utilities, and road infrastructure where susceptible soils occur. These are potential consequences, not a mapped exposure count.

Plan Participant	Vulnerabilities and Impacts
City of Kanab	**Vulnerabilities:** The City of Kanab contains the county's largest concentration of residents, homes, businesses, schools, public buildings, emergency facilities, utilities, roads, visitor-serving facilities, and municipal services located on or near fine-grained alluvial deposits, valley-floor soils, alluvial terraces, drainage corridors, and areas along Kanab Creek. The City of Kanab is vulnerable to expansive, saline, gypsiferous, shallow, rocky, erodible, and locally collapsible soils where development, roads, utilities, stormwater systems, septic or wastewater systems, and public facilities depend on stable soil conditions and effective moisture control. **Impacts:** Problem soils affecting the City of Kanab could damage foundations, slabs, sidewalks, pavements, curbs, drainage systems, water and wastewater lines, utilities, public buildings, schools, businesses, lodging facilities, and other visitor-serving assets; increase construction, maintenance, and repair costs; disrupt roads, utilities, emergency response, schools, businesses, and municipal services; create business interruption or tourism impacts; and worsen soil instability where leaks, stormwater, or irrigation saturate moisture-sensitive soils. Planning considerations include Kane County Hospital, schools, government and emergency-service buildings, water and utility systems, roads, and drainage infrastructure. Settlement, soil movement, erosion, or corrosion can damage foundations, buried utilities, and road infrastructure where susceptible soils occur. These are potential consequences, not a mapped exposure count.
Town of Orderville	**Vulnerabilities:** The Town of Orderville's residents, homes, local roads, public facilities, utilities, septic systems, agricultural or ranching operations, visitor-serving uses, drainage features, and valley-community settings are exposed to problem soils where development and infrastructure intersect alluvial, shallow, rocky, erodible, saline, expansive, or locally collapsible soils. The town's location along important travel and visitor access routes increases vulnerability where roads, bridge approaches, culverts, utility lines, homes, septic systems, agricultural access, and visitor services depend on stable soils and reliable drainage. **Impacts:** Potential impacts include foundation cracking, slab movement, pavement distress, road settlement, shoulder loss, culvert damage, septic limitations, pipe breaks, drainage problems, erosion, reduced agricultural productivity, damage to outbuildings or equipment pads, higher maintenance and construction costs, disruption to residents, utilities, agriculture, businesses, and visitor travel, and longer-term repair needs where wet-dry cycles or runoff worsen soil conditions. Planning considerations include public-service facilities, water and utility systems, roads, bridges, culverts, and visitor-access routes. Settlement, soil movement, erosion, or corrosion can damage foundations, buried utilities, and road infrastructure where susceptible soils occur. These are potential consequences, not a mapped exposure count.

Radon Gas

Table 143 summarizes radon gas vulnerabilities and potential impacts for Kane County participants.

Table 143: Radon Gas Vulnerability and Impact Assessment for Kane County

Plan Participant	Vulnerabilities and Impacts
Unincorporated Kane County	**Vulnerabilities:** Unincorporated Kane County includes dispersed homes, seasonal housing, rental units, public buildings, schools, childcare facilities, healthcare facilities, lodging, businesses, and other frequently occupied structures that are exposed to radon where naturally occurring gas migrates from soil and rock into buildings. Kane County is classified as an EPA[225] Zone 2 county, meaning predicted average indoor screening levels are between 2 and 4 pCi/L; however, individual buildings can still test above the EPA action level. Ground-contact structures with basements, crawlspaces, slab-on-grade construction, foundation cracks, utility penetrations, or limited ventilation are especially vulnerable, particularly where buildings remain untested or unmitigated. **Impacts:** Radon exposure does not typically damage structures or infrastructure, but long-term exposure can increase lung cancer risk for residents, workers, students, visitors, and occupants of public or private buildings. Potential impacts include chronic public health effects, testing and mitigation costs for property owners and public agencies, delayed property transactions or occupancy decisions, increased burdens for lower-income households and renters, and prolonged exposure where rural distance, limited provider availability, or low awareness delays testing and mitigation. Planning considerations include occupied government, emergency-service, community, healthcare, school, and other public-service buildings identified in the participant inventory. Occupied public-service buildings may require testing and mitigation; radon does not directly damage roads or utility networks. These are potential consequences, not a mapped exposure count.
Town of Alton	**Vulnerabilities:** The Town of Alton's homes, rental units, public buildings, community facilities, schools or childcare settings, businesses, and other frequently occupied structures are exposed to radon where gas enters buildings from underlying soil and rock. Buildings with direct ground contact, basements, crawlspaces, slab-on-grade construction, foundation cracks, utility penetrations, or limited ventilation are vulnerable, especially where residents or property owners have not completed radon testing or mitigation. The town's rural setting may increase vulnerability if access to testing kits, certified mitigation providers, or public outreach is limited.

[225] EPA = U.S. Environmental Protection Agency

Plan Participant	Vulnerabilities and Impacts
	Impacts: Potential impacts include cumulative lung cancer risk for residents and occupants of untested or unmitigated buildings, testing and mitigation costs for homeowners, landlords, businesses, and public agencies, delayed corrective action due to limited local service availability, reduced housing or rental marketability where elevated radon is identified, and disproportionate burdens for lower-income households, renters, older adults, and residents of older homes. Planning considerations include occupied government, emergency-service, community, healthcare, school, and other public-service buildings identified in the participant inventory. Occupied public-service buildings may require testing and mitigation; radon does not directly damage roads or utility networks. These are potential consequences, not a mapped exposure count.
Town of Big Water	**Vulnerabilities:** The Town of Big Water's homes, seasonal housing, rental units, lodging, visitor-serving businesses, public facilities, and other frequently occupied structures are exposed to radon where naturally occurring gas migrates into buildings from soil and rock. Ground-contact structures, buildings with crawlspaces or slab-on-grade foundations, foundation openings, utility penetrations, or limited ventilation are vulnerable, particularly where structures are used by residents, seasonal occupants, workers, or visitors and have not been tested or mitigated. **Impacts:** Radon exposure could create long-term health risks for residents, workers, seasonal occupants, and visitors staying in untested or unmitigated buildings. Potential impacts include cumulative lung cancer risk, testing and mitigation costs for homeowners, lodging owners, businesses, landlords, and public agencies, temporary disruption during mitigation installation, delayed property transfers or lodging-related corrective work, and prolonged exposure where awareness or access to certified mitigation providers is limited. Planning considerations include occupied government, emergency-service, community, healthcare, school, and other public-service buildings identified in the participant inventory. Occupied public-service buildings may require testing and mitigation; radon does not directly damage roads or utility networks. These are potential consequences, not a mapped exposure count.
Town of Glendale	**Vulnerabilities:** The Town of Glendale's homes, rental units, public buildings, community facilities, schools or childcare settings, businesses, and other frequently occupied structures are exposed to radon where gas enters buildings through foundations, crawlspaces, slab openings, utility penetrations, or other ground-contact pathways. Older homes, buildings with limited ventilation, and structures that have not been tested or mitigated are especially vulnerable. The town's rural setting and dispersed development pattern may increase vulnerability where testing, mitigation services, or public health outreach are less readily available. **Impacts:** Potential impacts include long-term lung cancer risk for residents and occupants of untested or unmitigated buildings, testing and mitigation costs for households, landlords, businesses, and public agencies, temporary

Plan Participant	Vulnerabilities and Impacts
	disruption during mitigation work, reduced marketability or delayed property transactions where elevated radon is found, and disproportionate effects on renters, lower-income households, older adults, and occupants of older buildings. Planning considerations include occupied government, emergency-service, community, healthcare, school, and other public-service buildings identified in the participant inventory. Occupied public-service buildings may require testing and mitigation; radon does not directly damage roads or utility networks. These are potential consequences, not a mapped exposure count.
City of Kanab	**Vulnerabilities:** The City of Kanab contains the county's largest concentration of residents, homes, rental housing, schools, childcare facilities, healthcare facilities, government buildings, businesses, lodging, visitor-serving facilities, and other frequently occupied structures. These assets are exposed to radon where naturally occurring gas migrates from soil and rock into ground-contact buildings. The City of Kanab has increased vulnerability because more people, public services, visitor accommodations, and occupied buildings are concentrated in one area; buildings with basements, crawlspaces, slab-on-grade construction, foundation cracks, utility penetrations, or limited ventilation are especially vulnerable if they remain untested or unmitigated. **Impacts:** Radon exposure affecting the City of Kanab could increase long-term lung cancer risk for residents, students, workers, visitors, and occupants of homes, schools, public buildings, healthcare facilities, lodging, and businesses. Potential impacts include testing and mitigation costs for households, landlords, businesses, lodging operators, schools, healthcare providers, and public agencies; delayed property transactions, rental turnover, or facility occupancy decisions; temporary disruption during mitigation work; public communication needs if elevated radon is found in public facilities; and disproportionate burdens for renters, lower-income households, older adults, and occupants of older or untested buildings. Planning considerations include occupied government, emergency-service, community, healthcare, school, and other public-service buildings identified in the participant inventory. Occupied public-service buildings may require testing and mitigation; radon does not directly damage roads or utility networks. These are potential consequences, not a mapped exposure count.
Town of Orderville	**Vulnerabilities:** The Town of Orderville's homes, rental units, seasonal housing, public buildings, schools or childcare settings, businesses, visitor-serving uses, and other frequently occupied structures are exposed to radon where gas migrates into buildings from underlying soil and rock. Buildings with direct ground contact, basements, crawlspaces, slab-on-grade construction, foundation cracks, utility penetrations, or limited ventilation are vulnerable, especially where testing and mitigation have not occurred. The town's rural location and visitor-serving activity may increase vulnerability where residents, workers, seasonal occupants, or visitors spend time in untested buildings.

Plan Participant	Vulnerabilities and Impacts
	Impacts: Potential impacts include cumulative lung cancer risk for residents, workers, visitors, and occupants of untested or unmitigated buildings; testing and mitigation costs for homeowners, landlords, businesses, lodging operators, and public agencies; delayed mitigation due to limited provider availability or distance; reduced marketability or delayed property transfers where elevated radon is identified; and disproportionate burdens for renters, lower-income households, older adults, seasonal occupants, and residents of older homes. Planning considerations include occupied government, emergency-service, community, healthcare, school, and other public-service buildings identified in the participant inventory. Occupied public-service buildings may require testing and mitigation; radon does not directly damage roads or utility networks. These are potential consequences, not a mapped exposure count.

Thunderstorms and Lightning

Table 144 summarizes thunderstorms and lightning vulnerabilities and potential impacts for Kane County participants.

Table 144: Thunderstorms and Lightning Vulnerability and Impact Assessment for Kane County

Plan Participant	Vulnerabilities and Impacts
Unincorporated Kane County	**Vulnerabilities:** Unincorporated Kane County includes remote communities, public lands, transportation corridors, utilities, campgrounds, marinas, recreation areas, slot canyons, Lake Powell, Glen Canyon National Recreation Area, and dispersed residences that are exposed to thunderstorms and lightning. The county's vulnerability is elevated where residents, visitors, boaters, hikers, campers, travelers, utility systems, roads, and recreation facilities are exposed to cloud-to-ground lightning, strong outflow winds, brief heavy rainfall, dry lightning, and rapidly changing weather. High visitor use, limited shelter, remote terrain, long response distances, and limited utility or access redundancy increase vulnerability in recreation areas and public lands.[226] **Impacts:** Thunderstorms and lightning could cause injuries or fatalities from lightning strikes, microburst winds, hazardous boating conditions, falling debris, and rapidly changing weather; damage boats, docks, marina facilities, campgrounds, roads, utilities, roofs, outbuildings, signs, and recreation infrastructure; disrupt power, communications, transportation, emergency response, park operations, and visitor services; create hazardous travel and water conditions; ignite wildfires during dry lightning events; and affect

[226] National Park Service, Glen Canyon National Recreation Area, Safety, updated July 7, 2026. https://www.nps.gov/glca/planyourvisit/safety.htm. Source for high winds, lightning, flash flooding, heat, and recreation-access concerns.

Plan Participant	Vulnerabilities and Impacts
	tourism and recreation activity, especially in Glen Canyon, Lake Powell, slot canyons, high-elevation terrain, and remote travel corridors. Planning considerations include county government and emergency-response facilities, water and communications systems, rural roads, bridges, culverts, and recreation access routes. Lightning, surge damage, wind, and runoff can interrupt power, communications, facility operations, and emergency access. These are potential consequences, not a mapped exposure count.
Town of Alton	**Vulnerabilities:** The Town of Alton's residents, homes, local roads, utilities, public facilities, agricultural and ranching assets, outdoor workers, recreation users, and surrounding open or elevated terrain are exposed to thunderstorms and lightning. The town's rural setting increases vulnerability where above-ground utilities, limited access routes, agricultural operations, outbuildings, livestock, and people outdoors are exposed to cloud-to-ground lightning, gusty outflow winds, brief heavy rainfall, and dry lightning that may ignite wildfire. **Impacts:** Potential impacts include lightning-related injury, localized power or communications outages, damage to roofs, signs, fences, outbuildings, utility lines, and agricultural equipment, hazardous travel from wind, rain, debris, or reduced visibility, delayed emergency response, disruption to agricultural or ranching operations, and increased wildfire risk during dry thunderstorm conditions. Planning considerations include community and public-service facilities, local water and utility systems, roads, and drainage crossings. Lightning, surge damage, wind, and runoff can interrupt power, communications, facility operations, and emergency access. These are potential consequences, not a mapped exposure count.
Town of Big Water	**Vulnerabilities:** The Town of Big Water's residents, homes, businesses, utilities, roads, visitor-serving facilities, campgrounds, recreation access, Lake Powell-related activity, and nearby Glen Canyon landscapes are exposed to thunderstorms and lightning. Vulnerability is elevated where boaters, visitors, recreation users, outdoor workers, utilities, and travel routes are exposed to sudden microburst winds, lightning, brief heavy rain, hazardous water conditions, and dry lightning in remote or open terrain with limited shelter and response access. **Impacts:** Thunderstorms and lightning could cause injuries to residents, visitors, boaters, and recreation users; damage homes, businesses, roofs, signs, vehicles, utilities, campgrounds, docks, boats, marina-related facilities, and recreation infrastructure; create hazardous boating and travel conditions; disrupt power, communications, emergency response, visitor services, and recreation access; ignite wildfires; and affect tourism activity tied to Lake Powell and Glen Canyon. Planning considerations include public-service and visitor-serving facilities, water and utility systems, roads, and recreation access routes. Lightning, surge damage, wind, and runoff can interrupt power, communications, facility operations, and emergency access. These are potential consequences, not a mapped exposure count.

Plan Participant	Vulnerabilities and Impacts
Town of Glendale	**Vulnerabilities:** The Town of Glendale's residents, homes, local roads, utilities, public facilities, agricultural and ranching assets, outbuildings, outdoor workers, recreation users, and canyon-influenced terrain are exposed to thunderstorms and lightning. The town is vulnerable where above-ground utilities, limited access routes, agricultural operations, livestock, outbuildings, and people outdoors are exposed to cloud-to-ground lightning, strong outflow winds, brief heavy rainfall, and dry lightning that can ignite wildfire or disrupt utilities. **Impacts:** Potential impacts include lightning-related injury, roof, siding, fence, sign, outbuilding, vehicle, and utility damage; localized power or communications outages; hazardous travel conditions from wind, debris, rain, or reduced visibility; delayed emergency response; disruption to residents, agriculture, and community services; and increased wildfire risk during dry thunderstorm conditions. Planning considerations include public-service facilities, water and utility systems, roads, bridges, culverts, and agricultural access routes. Lightning, surge damage, wind, and runoff can interrupt power, communications, facility operations, and emergency access. These are potential consequences, not a mapped exposure count.
City of Kanab	**Vulnerabilities:** The City of Kanab contains the county's largest concentration of residents, homes, businesses, schools, public buildings, emergency services, utilities, roads, visitor services, and community facilities. The City of Kanab is exposed to thunderstorms and lightning where developed areas, transportation routes, public facilities, utility systems, parks, outdoor workers, residents, and visitors experience cloud-to-ground lightning, strong outflow winds, brief heavy rainfall, and rapidly changing weather. The city's role as a county service center and visitor gateway increases vulnerability because a localized storm can affect a larger number of people, structures, utilities, public services, and tourism-related activities at one time. **Impacts:** Thunderstorms and lightning affecting the City of Kanab could cause injuries from lightning or windblown debris; damage roofs, signs, vehicles, utility lines, public facilities, schools, businesses, and outdoor assets; disrupt power, communications, traffic, emergency response, schools, government services, businesses, and visitor services; create hazardous travel conditions; increase demand for emergency response and public works cleanup; ignite fires from lightning; and produce economic impacts from business interruption, tourism disruption, and repair costs. Planning considerations include Kane County Hospital, schools, government and emergency-service buildings, water and utility systems, roads, and drainage infrastructure. Lightning, surge damage, wind, and runoff can interrupt power, communications, facility operations, and emergency access. These are potential consequences, not a mapped exposure count.
Town of Orderville	**Vulnerabilities:** The Town of Orderville's residents, homes, local roads, utilities, public facilities, agricultural and ranching operations, visitor-serving uses, outdoor workers, recreation access, and nearby canyon or high-elevation terrain are exposed to thunderstorms and lightning. The town's

Plan Participant	Vulnerabilities and Impacts
	location along important travel and recreation corridors increases vulnerability where residents, visitors, motorists, above-ground utilities, outbuildings, livestock, and agricultural assets are exposed to cloud-to-ground lightning, strong outflow winds, brief heavy rainfall, dry lightning, and rapidly changing weather. **Impacts:** Potential impacts include lightning-related injury, localized roof, siding, fence, sign, outbuilding, vehicle, utility, and agricultural equipment damage; power or communications outages; hazardous travel from wind, rain, debris, or reduced visibility; delayed emergency response; disruption to residents, businesses, agriculture, and visitor travel; temporary interruption of community services; and wildfire ignition during dry thunderstorm conditions. Planning considerations include public-service facilities, water and utility systems, roads, bridges, culverts, and visitor-access routes. Lightning, surge damage, wind, and runoff can interrupt power, communications, facility operations, and emergency access. These are potential consequences, not a mapped exposure count.

Tornadoes

Table 145 summarizes tornadoes vulnerabilities and potential impacts for Kane County participants.

Table 145: Tornadoes Vulnerability and Impact Assessment for Kane County

Plan Participant	Vulnerabilities and Impacts
Unincorporated Kane County	**Vulnerabilities:** Unincorporated Kane County includes dispersed residences, agricultural and ranching operations, public lands, transportation corridors, utilities, campgrounds, recreation areas, visitor-serving facilities, and remote communities that are exposed to tornadoes and severe convective storms. Although tornadoes are relatively infrequent in Kane County, documented tornado events demonstrate that damaging tornadoes can occur. Manufactured homes, outbuildings, livestock facilities, overhead utilities, recreation infrastructure, and structures without hardened shelter are particularly vulnerable to high winds, flying debris, and structural damage. The county's large geographic area, dispersed population, and limited shelter options in remote locations increase vulnerability during rapidly developing tornado events. **Impacts:** Tornadoes could cause injuries or fatalities from flying debris, structural collapse, and vehicle accidents; damage homes, manufactured housing, businesses, agricultural facilities, utility systems, vehicles, roads, signs, and recreation infrastructure; disrupt power, communications, transportation, emergency response, and public services; isolate residents in remote areas; damage crops, fencing, and livestock facilities; and create significant debris removal, repair, and recovery costs. Planning considerations include county government and emergency-response facilities, water and

Plan Participant	Vulnerabilities and Impacts
	communications systems, rural roads, bridges, culverts, and recreation access routes. Wind and debris can damage facilities and utilities and block emergency access. These are potential consequences, not a mapped exposure count.
Town of Alton	**Vulnerabilities:** The Town of Alton's residents, homes, local roads, utilities, public facilities, agricultural and ranching assets, livestock facilities, vehicles, and outdoor infrastructure are exposed to tornadoes and severe thunderstorm winds. The town's rural setting increases vulnerability where homes, outbuildings, agricultural structures, and above-ground utilities may have limited protection from high winds and flying debris, and where residents may have limited access to hardened shelter during rapidly developing events. **Impacts:** Potential impacts include injuries from flying debris, damage to homes, roofs, outbuildings, fences, utility lines, vehicles, and agricultural facilities; power and communications outages; hazardous travel conditions; disruption to agricultural operations and community services; and increased debris removal and recovery costs. Planning considerations include community and public-service facilities, local water and utility systems, roads, and drainage crossings. Wind and debris can damage facilities and utilities and block emergency access. These are potential consequences, not a mapped exposure count.
Town of Big Water	**Vulnerabilities:** The Town of Big Water's residents, homes, businesses, utilities, roads, visitor-serving facilities, campgrounds, recreation access, and Lake Powell-related infrastructure are exposed to tornadoes and severe convective storms. Visitors, recreation users, and outdoor workers are vulnerable where shelter options may be limited and where high winds and flying debris can affect campgrounds, marinas, vehicles, boats, and outdoor facilities. **Impacts:** Tornadoes could damage homes, businesses, utility systems, vehicles, boats, docks, campgrounds, signage, and recreation infrastructure; disrupt power, communications, transportation, emergency response, and visitor services; create hazardous conditions for residents and visitors; and affect tourism activity associated with Lake Powell and Glen Canyon. Planning considerations include public-service and visitor-serving facilities, water and utility systems, roads, and recreation access routes. Wind and debris can damage facilities and utilities and block emergency access. These are potential consequences, not a mapped exposure count.
Town of Glendale	**Vulnerabilities:** The Town of Glendale's residents, homes, local roads, utilities, public facilities, agricultural and ranching assets, livestock facilities, vehicles, and outdoor structures are exposed to tornadoes and severe thunderstorm winds. Agricultural operations, outbuildings, fencing, and overhead utilities are vulnerable to wind damage and flying debris, while the town's rural setting may limit access to hardened shelter and increase recovery challenges following a tornado event.

Plan Participant	Vulnerabilities and Impacts
	Impacts: Potential impacts include injuries from flying debris, damage to homes, public facilities, agricultural structures, fences, vehicles, utility systems, and roads; localized power and communications outages; disruption to agricultural operations and community services; hazardous travel conditions; and increased cleanup, repair, and recovery costs. Planning considerations include public-service facilities, water and utility systems, roads, bridges, culverts, and agricultural access routes. Wind and debris can damage facilities and utilities and block emergency access. These are potential consequences, not a mapped exposure count.
City of Kanab	**Vulnerabilities:** The City of Kanab contains the county's largest concentration of residents, homes, businesses, schools, public buildings, emergency services, utilities, roads, visitor services, and community facilities. The City of Kanab is exposed to tornadoes and severe convective storms that can produce damaging winds and flying debris. Because population, infrastructure, public services, and visitor activity are concentrated within the city, a tornado affecting Kanab could impact a larger number of people, structures, and critical facilities than elsewhere in the county. **Impacts:** Tornadoes affecting the City of Kanab could cause injuries or fatalities, damage homes, businesses, schools, public buildings, vehicles, utility systems, and transportation infrastructure; disrupt power, communications, emergency services, government operations, schools, businesses, and visitor services; create substantial debris removal and repair needs; and result in economic losses from property damage, business interruption, and tourism disruption. Planning considerations include Kane County Hospital, schools, government and emergency-service buildings, water and utility systems, roads, and drainage infrastructure. Wind and debris can damage facilities and utilities and block emergency access. These are potential consequences, not a mapped exposure count.
Town of Orderville	**Vulnerabilities:** The Town of Orderville's residents, homes, local roads, utilities, public facilities, agricultural and ranching operations, visitor-serving uses, vehicles, and outdoor infrastructure are exposed to tornadoes and severe thunderstorm winds. The town's location along regional travel and visitor corridors increases vulnerability where residents, visitors, motorists, agricultural facilities, and above-ground utilities are exposed to high winds, flying debris, and rapidly developing severe weather. **Impacts:** Potential impacts include injuries from flying debris, damage to homes, outbuildings, agricultural facilities, vehicles, utility systems, signs, and roads; localized power and communications outages; hazardous travel conditions; disruption to residents, businesses, agriculture, community services, and visitor travel; and increased cleanup, repair, and recovery costs. Planning considerations include public-service facilities, water and utility systems, roads, bridges, culverts, and visitor-access routes. Wind and debris can damage facilities and utilities and block emergency access. These are potential consequences, not a mapped exposure count.

Wildfire

Table 146 summarizes wildfire vulnerabilities and potential impacts for Kane County participants.

Table 146: Wildfire Vulnerability and Impact Assessment for Kane County

Plan Participant	Vulnerabilities and Impacts
Unincorporated Kane County	**Vulnerabilities:** Unincorporated Kane County contains extensive wildland vegetation, pinyon-juniper woodlands, shrublands, grasslands, forested areas, recreation destinations, campgrounds, public lands, dispersed residences, ranches, utility corridors, transportation routes, and wildland-urban interface areas that are exposed to wildfire. The county's vulnerability is elevated by large areas of federal and state lands, drought conditions, lightning-caused ignitions, human-caused ignitions, heavy fuel loading in some areas, and the presence of communities, infrastructure, and recreation assets near fire-prone vegetation. Remote terrain, limited access, long response distances, and high seasonal visitation further increase vulnerability. **Impacts:** Wildfires could cause injuries or fatalities, destroy homes and structures, damage utility systems, transportation routes, communication infrastructure, recreation facilities, agricultural assets, and public lands; disrupt power, communications, transportation, emergency response, tourism, and recreation; require evacuations and sheltering; degrade air quality; increase erosion, flooding, and debris flow risks after fire; damage watersheds and wildlife habitat; and create substantial suppression, recovery, and mitigation costs. Planning considerations include county government and emergency-response facilities, water and communications systems, rural roads, bridges, culverts, and recreation access routes. Fire, smoke, outages, and road closures can interrupt essential services where assets or access routes intersect fire-prone areas. These are potential consequences, not a mapped exposure count.
Town of Alton	**Vulnerabilities:** The Town of Alton's residents, homes, public facilities, local roads, utilities, agricultural and ranching operations, outbuildings, and surrounding vegetation are exposed to wildfire. The town's proximity to wildland vegetation and rural development patterns increase vulnerability where homes, fences, livestock facilities, utility infrastructure, and transportation routes interface with fire-prone fuels. Limited evacuation routes and extended response times may increase risk during fast-moving wildfire events. **Impacts:** Potential impacts include damage or destruction of homes, outbuildings, agricultural facilities, fences, utility infrastructure, and vehicles; evacuation of residents and livestock; disruption of transportation, utilities, and community services; smoke impacts to public health; increased erosion and runoff following fire; and significant recovery and repair costs. Planning considerations include community and public-service facilities, local water and utility systems, roads, and drainage crossings. Fire, smoke, outages, and road closures can interrupt essential services where assets or access routes

Plan Participant	Vulnerabilities and Impacts
	intersect fire-prone areas. These are potential consequences, not a mapped exposure count.
Town of Big Water	**Vulnerabilities:** The Town of Big Water's residents, homes, businesses, visitor-serving facilities, utilities, roads, campgrounds, recreation infrastructure, and nearby public lands are exposed to wildfire. Recreation activity, tourism, and the community's proximity to Glen Canyon and surrounding wildlands increase vulnerability where visitors, structures, transportation routes, and utility systems are located near flammable vegetation and ignition sources. **Impacts:** Wildfires could damage homes, businesses, visitor facilities, campgrounds, utilities, roads, and recreation infrastructure; require evacuations of residents and visitors; disrupt tourism, recreation access, transportation, communications, and emergency services; reduce air quality; and create economic losses associated with tourism disruption, suppression costs, and infrastructure repair. Planning considerations include public-service and visitor-serving facilities, water and utility systems, roads, and recreation access routes. Fire, smoke, outages, and road closures can interrupt essential services where assets or access routes intersect fire-prone areas. These are potential consequences, not a mapped exposure count.
Town of Glendale	**Vulnerabilities:** The Town of Glendale's residents, homes, public facilities, local roads, utilities, agricultural and ranching assets, livestock facilities, and surrounding vegetation are exposed to wildfire. The town's rural setting and proximity to fire-prone vegetation increase vulnerability where homes, outbuildings, fences, utility corridors, and agricultural operations are located near wildland fuels. Drought, dry vegetation, and wind-driven fire behavior can increase the potential for rapid fire spread. **Impacts:** Potential impacts include damage to homes, agricultural facilities, fences, utility systems, vehicles, and public infrastructure; evacuation of residents and livestock; disruption to agricultural operations, transportation, utilities, and community services; smoke-related public health impacts; increased erosion and runoff after fire; and significant cleanup, recovery, and mitigation costs. Planning considerations include public-service facilities, water and utility systems, roads, bridges, culverts, and agricultural access routes. Fire, smoke, outages, and road closures can interrupt essential services where assets or access routes intersect fire-prone areas. These are potential consequences, not a mapped exposure count.
City of Kanab	**Vulnerabilities:** The City of Kanab contains the county's largest concentration of residents, homes, businesses, schools, public buildings, emergency services, utilities, transportation infrastructure, visitor services, and community facilities. The City of Kanab is vulnerable to wildfire where developed areas interface with surrounding vegetation and where transportation corridors, utility systems, and recreation access routes connect the city to nearby fire-prone landscapes. The city's role as a regional service center and tourism gateway

Plan Participant	Vulnerabilities and Impacts
	increases vulnerability because wildfire impacts can affect a large number of residents, visitors, businesses, and critical services simultaneously. **Impacts:** Wildfires affecting the City of Kanab could damage homes, businesses, schools, public buildings, utilities, transportation infrastructure, and visitor-serving facilities; require evacuations; disrupt emergency services, government operations, schools, businesses, and tourism activity; degrade air quality; increase healthcare and emergency response demands; and result in substantial economic losses from property damage, business interruption, suppression costs, and recovery activities. Planning considerations include Kane County Hospital, schools, government and emergency-service buildings, water and utility systems, roads, and drainage infrastructure. Fire, smoke, outages, and road closures can interrupt essential services where assets or access routes intersect fire-prone areas. These are potential consequences, not a mapped exposure count.
Town of Orderville	**Vulnerabilities:** The Town of Orderville's residents, homes, public facilities, local roads, utilities, agricultural and ranching operations, visitor-serving uses, and surrounding vegetation are exposed to wildfire. The town's location along important recreation and transportation corridors increases vulnerability where homes, businesses, utility infrastructure, agricultural assets, and visitor facilities are located near wildland fuels. Wind-driven fire behavior, drought conditions, and human- or lightning-caused ignitions can increase wildfire risk. **Impacts:** Potential impacts include damage to homes, businesses, agricultural facilities, utility systems, roads, and visitor-serving infrastructure; evacuation of residents and visitors; disruption to transportation, utilities, agriculture, tourism, and community services; smoke-related health impacts; increased erosion and flooding risks following fire; and significant suppression, recovery, and mitigation costs. Planning considerations include public-service facilities, water and utility systems, roads, bridges, culverts, and visitor-access routes. Fire, smoke, outages, and road closures can interrupt essential services where assets or access routes intersect fire-prone areas. These are potential consequences, not a mapped exposure count.

Winter Storms

Table 147 summarizes winter storms vulnerabilities and potential impacts for Kane County participants.

Table 147: Winter Storms Vulnerability and Impact Assessment for Kane County

Plan Participant	Vulnerabilities and Impacts
Unincorporated Kane County	**Vulnerabilities:** Unincorporated Kane County includes higher-elevation areas, dispersed residences, rural communities, transportation corridors, utilities, public lands, recreation access routes, visitor-serving facilities, and critical service routes that are exposed to winter storms. Vulnerability is greatest along U.S. Highway 89, State Route 9, mountain and canyon routes, and higher-elevation areas where snowfall, drifting snow, black ice, reduced visibility, freezing rain, and prolonged cold can disrupt travel and service access. Limited transportation redundancy, long travel distances, remote residents, older adults, visitors, and reliance on utility and communications systems increase vulnerability during winter storms. **Impacts:** Winter storms could cause hazardous travel, crashes, road closures, delayed emergency response, power or communications outages, frozen pipes, heating interruptions, localized snow loading impacts, and disruption to schools, public services, utilities, freight movement, tourism, and access to medical care. Impacts could be minor to moderate countywide and locally major in higher-elevation areas or along key travel corridors, especially where outages or road closures isolate residents, visitors, or critical facilities. Planning considerations include county government and emergency-response facilities, water and communications systems, rural roads, bridges, culverts, and recreation access routes. Snow, ice, cold, and outages can restrict access, damage utility systems, and interrupt facility operations. These are potential consequences, not a mapped exposure count.
Town of Alton	**Vulnerabilities:** The Town of Alton's residents, homes, local roads, utilities, public facilities, agricultural and ranching operations, livestock, older adults, and surrounding higher-elevation terrain are exposed to winter storms. The town's rural setting and elevation increase vulnerability where snow, ice, freezing rain, reduced visibility, and prolonged cold can affect local access routes, heating, livestock care, utility service, and emergency response. **Impacts:** Potential impacts include hazardous travel, road closures or delayed plowing, power and communications outages, frozen pipes, heating interruptions, disruption to residents and public services, delayed emergency response, impacts to livestock and ranching operations, and increased costs for snow removal, repairs, and winter storm response. Planning considerations include community and public-service facilities, local water and utility systems, roads, and drainage crossings. Snow, ice, cold, and outages can restrict access, damage utility systems, and interrupt facility operations. These are potential consequences, not a mapped exposure count.

Plan Participant	Vulnerabilities and Impacts
Town of Big Water	**Vulnerabilities:** The Town of Big Water's residents, homes, businesses, utilities, roads, visitor-serving facilities, recreation access, and nearby travel corridors are exposed to winter storms, particularly freezing rain, icy roads, brief snow events, cold temperatures, and hazardous travel conditions. Although sustained snowfall may be less common than in higher-elevation areas, winter weather can still create vulnerability where roads, utilities, visitors, and local services are not routinely exposed to snow and ice. **Impacts:** Winter storms could create icy roads, travel delays, crashes, temporary access issues, power or communications outages, frozen pipes, heating needs, disruption to visitor services and local businesses, delayed emergency response, and increased response or road treatment costs. Even minor winter weather could affect residents and visitors if roads or services are disrupted. Planning considerations include public-service and visitor-serving facilities, water and utility systems, roads, and recreation access routes. Snow, ice, cold, and outages can restrict access, damage utility systems, and interrupt facility operations. These are potential consequences, not a mapped exposure count.
Town of Glendale	**Vulnerabilities:** The Town of Glendale's residents, homes, local roads, utilities, public facilities, agricultural and ranching assets, livestock, older adults, and surrounding elevated or canyon-influenced terrain are exposed to winter storms. The town is vulnerable where snow, ice, black ice, freezing rain, reduced visibility, and prolonged cold affect local roads, limited access routes, heating, utility service, and agricultural operations. **Impacts:** Potential impacts include hazardous travel, road closures or delayed access, power and communications outages, frozen pipes, heating interruptions, disruption to residents, agriculture, livestock care, public services, and emergency response, as well as increased snow removal, repair, and recovery costs. Planning considerations include public-service facilities, water and utility systems, roads, bridges, culverts, and agricultural access routes. Snow, ice, cold, and outages can restrict access, damage utility systems, and interrupt facility operations. These are potential consequences, not a mapped exposure count.
City of Kanab	**Vulnerabilities:** The City of Kanab contains the county's largest concentration of residents, homes, businesses, schools, public buildings, emergency services, utilities, roads, visitor services, and healthcare access. The City of Kanab is exposed to winter storms through freezing rain, icy roads, brief snowfall, cold temperatures, and travel disruption along U.S. Highway 89 and other routes serving the city. The city's role as a county service center and visitor gateway increases vulnerability because road closures, utility outages, or icy conditions can affect a larger number of residents, visitors, businesses, schools, and critical services at one time. **Impacts:** Winter storms affecting the City of Kanab could cause hazardous travel, crashes, school or business disruptions, delayed emergency response, power and communications outages, frozen pipes, heating interruptions,

Plan Participant	Vulnerabilities and Impacts
	interruption of government services, impacts to healthcare access, disruption to visitor services and tourism activity, and increased costs for road treatment, public works response, and utility restoration. Planning considerations include Kane County Hospital, schools, government and emergency-service buildings, water and utility systems, roads, and drainage infrastructure. Snow, ice, cold, and outages can restrict access, damage utility systems, and interrupt facility operations. These are potential consequences, not a mapped exposure count.
Town of Orderville	**Vulnerabilities:** The Town of Orderville's residents, homes, local roads, utilities, public facilities, agricultural and ranching operations, visitor-serving uses, older adults, and nearby mountain or canyon routes are exposed to winter storms. The town's location along important travel and visitor access corridors increases vulnerability where snowfall, drifting snow, black ice, freezing rain, reduced visibility, and prolonged cold can disrupt transportation, school access, emergency response, utility service, and visitor travel. **Impacts:** Potential impacts include hazardous travel, road closures or access delays, crashes, power and communications outages, frozen pipes, heating interruptions, disruption to residents, businesses, agriculture, visitor travel, schools, and community services, delayed emergency response, and increased costs for snow removal, road treatment, repairs, and recovery. Planning considerations include public-service facilities, water and utility systems, roads, bridges, culverts, and visitor-access routes. Snow, ice, cold, and outages can restrict access, damage utility systems, and interrupt facility operations. These are potential consequences, not a mapped exposure count.

Changes in Development

Changes in development include recent and planned development, including population changes and future conditions, which may affect the risks and vulnerabilities of the plan participants. Understanding how development can be impacted by the natural hazards profiled in this plan can help participants make sound development decisions, identify necessary mitigation actions, and reduce risk to both new and existing structures.

Kane County's population increased from 7,667 in the 2020 Census to an estimated 8,597 on July 1, 2025. The county had an estimated 6,979 housing units and 146 building permits in 2025. These figures indicate growth but do not show where development occurred relative to hazard areas. Population, seasonal housing, visitor accommodations, age characteristics, and dispersed settlement inform consequence and service-demand considerations but do not independently demonstrate a change in hazard vulnerability.[227]

[227] U.S. Census Bureau, QuickFacts: Kane County, Utah, V2025 population/housing estimates, 2020 Census, 2020-2024 ACS, 2022 Economic Census, and 2025 building permits. https://www.census.gov/quickfacts/fact/table/kanecountyutah/PST045225. Accessed October 9, 2026.

Future development could increase exposure if people, structures, utilities, visitor facilities, or access routes are added in flood-prone areas, the wildland-urban interface, unstable or problem-soil areas, dam-inundation areas, or locations with limited water, power, transportation, or emergency-service redundancy. Development review, zoning, subdivision requirements, building-code administration, geotechnical investigation, floodplain management, water planning, emergency access, and capital programming can reduce or avoid added risk. Proposed development is not treated as existing exposure.

Table 148 distinguishes potential effects of future development from observed changes since the previous plan. The available records do not identify development locations, jurisdiction-owned assets outside the planning area, or completed mitigation by participant sufficiently to determine increased, unchanged, or decreased vulnerability. An indeterminate finding is not a finding of unchanged vulnerability.

Table 148: Vulnerability Changes in Kane County

Plan Participant	Increased	Stayed the Same	Decreased
Unincorporated Kane County	Development, infrastructure investment, seasonal visitation, or growth near hazard-prone areas may increase exposure where new people or assets are added. No participant-specific observed increase is established.	Indeterminate: available participant-specific development and mitigation records do not establish whether vulnerability stayed the same.	No decrease is established by the available participant-specific records.
Town of Alton	Development, infrastructure investment, seasonal visitation, or growth near hazard-prone areas may increase exposure where new people or assets are added. No participant-specific observed increase is established.	Indeterminate: available participant-specific development and mitigation records do not establish whether vulnerability stayed the same.	No decrease is established by the available participant-specific records.
Town of Big Water	Development, infrastructure investment, seasonal visitation, or growth near hazard-prone areas may increase exposure where new people or assets are added. No participant-specific observed increase is established.	Indeterminate: available participant-specific development and mitigation records do not establish whether vulnerability stayed the same.	No decrease is established by the available participant-specific records.

Plan Participant	Increased	Stayed the Same	Decreased
Town of Glendale	Development, infrastructure investment, seasonal visitation, or growth near hazard-prone areas may increase exposure where new people or assets are added. No participant-specific observed increase is established.	Indeterminate: available participant-specific development and mitigation records do not establish whether vulnerability stayed the same.	No decrease is established by the available participant-specific records.
City of Kanab	Development, infrastructure investment, seasonal visitation, or growth near hazard-prone areas may increase exposure where new people or assets are added. No participant-specific observed increase is established.	Indeterminate: available participant-specific development and mitigation records do not establish whether vulnerability stayed the same.	No decrease is established by the available participant-specific records.
Town of Orderville	Development, infrastructure investment, seasonal visitation, or growth near hazard-prone areas may increase exposure where new people or assets are added. No participant-specific observed increase is established.	Indeterminate: available participant-specific development and mitigation records do not establish whether vulnerability stayed the same.	No decrease is established by the available participant-specific records.

Capability Assessment

The **capability assessment** defines the resources available to support mitigation. A thorough assessment of current mitigation capabilities helps outline who will be responsible for implementing mitigation actions, what current programs, policies, and funding sources could support action implementation, and what new capacity building actions could benefit the community. The local capability inventory describes the planning and administrative framework reported in the annex. Dated ordinance, staffing, and implementation records are not available to independently establish each entry's current status; the inventory does not demonstrate NFIP enforcement or completion of individual mitigation actions.

Unincorporated Kane County Capability Assessment

Table 149 describes the mitigation capabilities for Unincorporated Kane County.

Table 149: Unincorporated Kane County Capability Assessment

Capability	Description
Plans and Regulations	General Plan administration; land use authority; administrative land use authority; Planning Commission review and recommendations; land use regulations for unincorporated areas; subdivision review; zoning administration; building permits; floodplain management regulations; 2021 International Building Code; 2021 International Residential Code; 2020 National Electric Code; 2021 International Plumbing Code; 2021 International Mechanical Code; 2021 International Fire Code; other codes adopted by Utah State Code
Administrative and Technical	Land Use Authority; Administrative Land Use Authority; Planning Commission; Building Department; Office of Emergency Services; Transportation and GIS[228]; Road Maintenance Department; building permit review and inspections; emergency preparedness, planning, and response; transportation planning; new construction review; geographic information system; permitting and development review support; public infrastructure support; hazard mitigation implementation support
Financial	County budgeting processes; permitting fees; planning and zoning fees; building department payments; road disturbance permits; online permit and payment systems; local staff time; local match support for grants; small mitigation-related improvements; administrative support for plan implementation
Education and Outreach	Public notices; county meetings and agendas; department webpages; permit and application resources; Everbridge Community Emergency Notification System; Emergency Services public information; Land Use Authority public information; Planning Commission public information; Building Department public information; GIS and mapping resources
National Flood Insurance Program	• **NFIP Status: FEMA lists** Kane County as an NFIP-participating community (Community 490083).[229][230] • **Community Rating System:** No CRS class is reported in this entry. • **FEMA Effective Map Entry:** The effective-map field is recorded as 07/01/86(L); this is not a local ordinance-adoption date. • Floodplain Administration: The available records do not establish the current designated administrator or local implementation

[228] GIS = geographic information system
[229] NFIP = National Flood Insurance Program
[230] FEMA, OpenFEMA NFIP Community Status Book, Utah records, retrieved October 10, 2026; dataset refresh August 25, 2026. https://www.fema.gov/api/open/v1/NfipCommunityStatusBook. Map dates are FEMA effective-map entries, not evidence of local adoption or implementation.

Capability	Description
	responsibilities. County participation and procedures do not establish municipal authority. • **Permitting** and Enforcement: The available records do not establish local permitting or enforcement implementation. References to Risk MAP in the planning inventory do not document local permit decisions.[231] • **Substantial Improvement/Substantial Damage:** Participant-specific implementation records and repetitive-loss/severe-repetitive-loss building counts and types are not established by the available evidence. No zero count or finding of compliance is inferred.

The following opportunities would expand and improve Unincorporated Kane County mitigation capabilities:

- **Plans and Regulations:** Opportunities to improve or expand planning and regulatory capabilities include explicitly incorporating hazard mitigation considerations into land use review, subdivision review, road access review, floodplain permitting, wildfire interface considerations, and future General Plan or ordinance updates.
- **Administrative and Technical:** Opportunities to improve or expand administrative and technical capabilities include using geographic information systems (GIS) more consistently to support hazard exposure review, coordinating development review with emergency access and road maintenance considerations, and documenting how planning, building, roads, emergency management, and GIS staff coordinate on mitigation actions.
- **Financial:** Opportunities to improve or expand financial capabilities include identifying local match sources for mitigation grants, tracking mitigation-related capital improvements, and aligning road, drainage, building, emergency management, and public infrastructure funding with priority mitigation actions.
- **Education and Outreach:** Opportunities to improve education and outreach capabilities include expanding outreach on floodplain requirements, wildfire preparedness, emergency alerts, severe weather preparedness, safe development practices, and the importance of hazard-informed permitting in unincorporated areas.
- **National Flood Insurance Program (NFIP):** Opportunities to improve or expand NFIP capabilities include updating and maintaining floodplain records, continuing to enforce development permit requirements in Special Flood Hazard Areas, reviewing substantial improvement and substantial damage procedures after events, increasing public education about flood risk, and evaluating whether Community Rating System (CRS) participation would be beneficial in the future.

[231] SFHA = Special Flood Hazard Area

Town of Alton Capability Assessment

Table 150 describes the mitigation capabilities for the Town of Alton.

Table 150: Town of Alton Capability Assessment

Capability	Description
Plans and Regulations	Alton Master Plan (1981); town land use and zoning administration; Planning Commission review of subdivision ordinance updates and land use matters; Town Council ordinance and budget authority; building permit administration through the Town Office; Utah-adopted building codes used as baseline for construction review; coordination with Kane County Building Department where needed for plan review or inspections
Administrative and Technical	Town Council; Planning Commission; Town Office; municipal building permit administration; subdivision and development review; public meeting and public notice process; coordination with Kane County departments for building inspections, emergency services, road access, public safety, and other technical support; small-town staff and elected official capacity to support mitigation action coordination
Financial	Town budgeting processes; building permit fees; planning and zoning fees where applicable; local staff and elected official time; coordination with Kane County and state or federal partners for technical and funding assistance; local match support as available for small mitigation-related improvements, infrastructure maintenance, emergency preparedness, and grant-supported projects
Education and Outreach	Public notices through the Utah Public Notice Website; Town Council and Planning Commission meetings; public hearings for ordinance updates; Town Office contact and permit information; local public meeting agendas; coordination with Kane County Emergency Services and regional partners for emergency alerts, preparedness messaging, hazard mitigation information, and public outreach

Capability	Description
National Flood Insurance Program	• **NFIP Status:** No separate NFIP or CRS entry for Alton was found in the complete Utah Community Status Book records reviewed. County participation does not establish municipal participation; the absence of an entry does not establish absence of local floodplain regulation.[232] • **Community Rating System:** No separate CRS entry was found in the reviewed FEMA records. • **FEMA Effective Map Entry:** No separate effective-map entry was found for the municipality in the reviewed status-book records; this does not establish absence of flood risk.[233] • **Floodplain Administration:** The available records do not establish the current designated administrator or local implementation responsibilities. County participation and procedures do not establish municipal authority. • **Permitting and Enforcement:** The available records do not establish local permitting or enforcement implementation. References to Risk MAP in the planning inventory do not document local permit decisions. • **Substantial Improvement/Substantial Damage:** Participant-specific implementation records and repetitive-loss/severe-repetitive-loss building counts and types are not established by the available evidence. No zero count or finding of compliance is inferred.

The following opportunities would expand and improve the Town of Alton mitigation capabilities:

- **Plans and Regulations:** Opportunities to improve or expand planning and regulatory capabilities include updating the Town's older master plan or preparing a current general plan, incorporating hazard mitigation into subdivision and land use ordinance updates, documenting how building permit review considers hazards such as snow load, wildfire, flooding, drainage, steep slopes, and problem soils, and coordinating with Kane County on development review where county technical support is needed.
- **Administrative and Technical:** Opportunities to improve or expand administrative and technical capabilities include documenting Town roles for mitigation implementation, strengthening coordination among the Town Council, Planning Commission, Town Office, Kane County Building Department, Kane County Emergency Services, and road or public works partners, and using available county or state GIS and hazard data during development, access, drainage, and emergency preparedness review.
- **Financial:** Opportunities to improve or expand financial capabilities include identifying potential local match sources for mitigation grants, tracking mitigation-related needs through the annual budget process, coordinating with Kane County and the Five County Association of Governments on grant

[232] FEMA, OpenFEMA NFIP Community Status Book, Utah records, retrieved October 10, 2026; dataset refresh August 25, 2026. https://www.fema.gov/api/open/v1/NfipCommunityStatusBook. Map dates are FEMA effective-map entries, not evidence of local adoption or implementation.
[233] NSFHA = no special flood hazard area

opportunities, and aligning limited local funds with priority actions related to roads, drainage, wildfire preparedness, emergency access, and public infrastructure maintenance.

- **Education and Outreach:** Opportunities to improve education and outreach capabilities include using public meetings, public notices, the Town Office, and coordination with Kane County Emergency Services to share information on emergency alerts, wildfire preparedness, winter storm readiness, severe weather safety, safe development practices, building permits, and hazard-informed subdivision and land use decisions.
- **National Flood Insurance Program:** Opportunities to improve or expand NFIP capabilities include periodically confirming the Town's NFIP status and mapped flood hazard status, coordinating with Kane County and the Utah Division of Emergency Management on floodplain mapping or flood risk information, maintaining records of any drainage or flood-related development concerns, educating residents that flood risk can exist outside mapped Special Flood Hazard Areas, and evaluating whether future floodplain management procedures are needed if flood hazard mapping or development conditions change.

Town of Big Water Capability Assessment

Table 151 describes the mitigation capabilities for Big Water.

Table 151: Town of Big Water Capability Assessment

Capability	Description
Plans and Regulations	Big Water General Plan (2022); Municipal Code; Zoning Code; Planning and Zoning Commission review of zoning, land use, lot line adjustment, parcel joinder, temporary use, short-term rental, transportation, trail, and ordinance matters; Town Council ordinance and budget authority; building permit application and review process through Town Hall; Utah-adopted building codes used as baseline for construction review; consideration of the 2024 International Wildland-Urban Interface Code through Town Council public hearing
Administrative and Technical	Town Council; Planning and Zoning Commission; Town Hall; Zoning Administrator; building permit administration; land use, zoning, subdivision, lot line adjustment, temporary use, and conditional use review; public meeting and public notice process; coordination with Kane County, state, federal, and Glen Canyon-area partners for emergency services, road access, public safety, recreation access, wildfire preparedness, and other technical support
Financial	Town budgeting processes; building permit application fees; planning, zoning, and land use fees where applicable; local staff and elected official time; public hearing and budget adoption process; coordination with Kane County, state, federal, and regional partners for technical and funding assistance; local match support as available for small mitigation-related improvements, road and drainage maintenance, wildfire preparedness,

Capability	Description
	recreation-access resilience, emergency preparedness, and grant-supported projects
Education and Outreach	Public notices through the Utah Public Notice Website; Town Council and Planning and Zoning Commission meetings; public hearings for budget, zoning, municipal code, and land use updates; Town Hall contact and permit information; building permit application materials; local public meeting agendas and packets; coordination with Kane County Emergency Services and regional partners for emergency alerts, wildfire preparedness, flood risk, severe weather, recreation safety, and hazard mitigation outreach
National Flood Insurance Program	• **NFIP Status:** No separate NFIP or CRS entry for Big Water was found in the complete Utah Community Status Book records reviewed. County participation does not establish municipal participation; the absence of an entry does not establish absence of local floodplain regulation.[234] • **Community Rating System:** No separate CRS entry was found in the reviewed FEMA records. • **FEMA Effective Map Entry:** No separate effective-map entry was found for the municipality in the reviewed status-book records; this does not establish absence of flood risk. • **Floodplain Administration:** The available records do not establish the current designated administrator or local implementation responsibilities. County participation and procedures do not establish municipal authority. • **Permitting and Enforcement:** The available records do not establish local permitting or enforcement implementation. References to Risk MAP in the planning inventory do not document local permit decisions. • **Substantial Improvement/Substantial Damage:** Participant-specific implementation records and repetitive-loss/severe-repetitive-loss building counts and types are not established by the available evidence. No zero count or finding of compliance is inferred.

The following opportunities would expand and improve the Town of Big Water mitigation capabilities:

- **Plans and Regulations:** Opportunities to improve or expand planning and regulatory capabilities include using the 2022 General Plan to integrate hazard mitigation into land use, transportation, recreation access, trail, and infrastructure decisions; continuing to update the Municipal Code and Zoning Code to reflect current development needs; documenting how permit review considers hazards such as wildfire, flooding, drainage, extreme heat, problem soils, steep slopes, and recreation-access constraints; and coordinating with Kane County and federal land partners where development or access issues involve surrounding public lands.

[234] FEMA, OpenFEMA NFIP Community Status Book, Utah records, retrieved October 10, 2026; dataset refresh August 25, 2026. https://www.fema.gov/api/open/v1/NfipCommunityStatusBook. Map dates are FEMA effective-map entries, not evidence of local adoption or implementation.

- **Administrative and Technical:** Opportunities to improve or expand administrative and technical capabilities include documenting Town roles for mitigation implementation, strengthening coordination among the Town Council, Planning and Zoning Commission, Zoning Administrator, Town Hall, Kane County Emergency Services, Kane County Building Department, road and public works partners, and federal or state land managers, and using available GIS, flood, wildfire, transportation, and recreation-access data during development and emergency preparedness review.
- **Financial:** Opportunities to improve or expand financial capabilities include identifying potential local match sources for mitigation grants, tracking mitigation-related needs through the annual budget process, coordinating with Kane County and the Five County Association of Governments on grant opportunities, and aligning limited local funds with priority actions related to roads, drainage, wildfire preparedness, emergency access, public infrastructure, and recreation-access resilience.
- **Education and Outreach:** Opportunities to improve education and outreach capabilities include using public meetings, public hearings, public notices, Town Hall, permit materials, and coordination with Kane County Emergency Services to share information on emergency alerts, wildfire preparedness, flood and flash flood safety, extreme heat safety, severe weather readiness, building permits, safe recreation access, and hazard-informed land use and zoning decisions.
- **National Flood Insurance Program:** Opportunities to improve or expand NFIP capabilities include periodically confirming the Town's NFIP status and mapped flood hazard status, coordinating with Kane County and the Utah Division of Emergency Management on floodplain mapping or flood risk information, maintaining records of drainage or flood-related development concerns, educating residents and visitors that flash flood risk can exist outside mapped Special Flood Hazard Areas, and evaluating whether future floodplain management procedures are needed if mapping, development, or flood risk conditions change.

Town of Glendale Capability Assessment

Table 152 describes the mitigation capabilities for the Town of Glendale.

Table 152: Town of Glendale Capability Assessment

Capability	Description
Plans and Regulations	Glendale Town Zoning Ordinance (2024); Hillside Ordinance (2003); Planning and Zoning building approval process; building permit application process through the Town's online permit system; conditional use permit process; Town Board ordinance and budget authority; Planning and Zoning Committee review of zoning, building, and development matters; Utah-adopted building codes used as baseline for construction review; coordination with Kane County where needed for emergency services, public safety, and technical support
Administrative and Technical	Town Board; Planning and Zoning Committee; Clerk-Treasurer and Town Hall staff; building permit administration; zoning, conditional use, business license, water connection, and development review processes; public works

Capability	Description
	functions for garbage, water, sewer, irrigation, and streets; public meeting and public notice process; coordination with Kane County Sheriff's Office, Kane County Emergency Services, Southwest Utah Public Health Department, Kane County Hospital, and other county or regional partners
Financial	Town budgeting processes; consolidated fee schedule; building permit fees; business license fees; conditional use permit fees; water, sewer, irrigation, cemetery, and other local service fees where applicable; online bill pay; staff and elected official time; coordination with Kane County, state, federal, and regional partners for technical and funding assistance; local match support as available for mitigation-related improvements, water and spring projects, roads, drainage, wildfire preparedness, and emergency preparedness
Education and Outreach	Public notices through the Utah Public Notice Website; Town Board and Planning and Zoning Committee meetings; public hearings for zoning, budget, water, and development matters; Town website, meetings and minutes, ordinances, forms and permits, and public notices pages; TextMyGov town notifications; Glendale Facebook and social media; Town Hall contact and permit information; coordination with Kane County Emergency Services and regional partners for emergency alerts, preparedness messaging, hazard mitigation information, and public outreach
National Flood Insurance Program	• **NFIP** Status: FEMA lists Glendale as an NFIP-participating community (Community 490084).[235] • **Community Rating System:** No CRS class is reported in this entry. • **FEMA Effective Map Entry:** The effective-map field is recorded as 05/01/86(L); this is not a local ordinance-adoption date. • **Floodplain Administration:** The available records do not establish the current designated administrator or local implementation responsibilities. County participation and procedures do not establish municipal authority. • **Permitting** and Enforcement: The available records do not establish local permitting or enforcement implementation. References to Risk MAP in the planning inventory do not document local permit decisions. • **Substantial Improvement/Substantial Damage: Particip**ant-specific implementation records and repetitive-loss/severe-repetitive-loss building counts and types are not established by the available evidence. No zero count or finding of compliance is inferred.

The following opportunities would expand and improve the Town of Glendale mitigation capabilities:

[235] FEMA, OpenFEMA NFIP Community Status Book, Utah records, retrieved October 10, 2026; dataset refresh August 25, 2026. https://www.fema.gov/api/open/v1/NfipCommunityStatusBook. Map dates are FEMA effective-map entries, not evidence of local adoption or implementation.

- **Plans and Regulations:** Opportunities to improve or expand planning and regulatory capabilities include using the updated Zoning Ordinance and Hillside Ordinance to integrate hazard mitigation into zoning, hillside development, building approval, conditional use, and infrastructure decisions; documenting how building permit review considers hazards such as wildfire, flooding, drainage, steep slopes, landslides, problem soils, snow load, and winter access; and coordinating with Kane County where development review requires county technical support.
- **Administrative and Technical:** Opportunities to improve or expand administrative and technical capabilities include documenting Town roles for mitigation implementation, strengthening coordination among the Town Board, Planning and Zoning Committee, Town Hall, public works, Kane County Emergency Services, Kane County Sheriff's Office, Kane County Building Department, and health or utility partners, and using available GIS, flood, wildfire, slope, road, and utility information during development, access, drainage, and emergency preparedness review.
- **Financial:** Opportunities to improve or expand financial capabilities include identifying potential local match sources for mitigation grants, tracking mitigation-related needs through the annual budget and fee schedule process, coordinating with Kane County and the Five County Association of Governments on grant opportunities, and aligning limited local funds with priority actions related to water and springs improvements, roads, drainage, wildfire preparedness, emergency access, utilities, and public infrastructure maintenance.
- **Education and Outreach:** Opportunities to improve education and outreach capabilities include using public meetings, public hearings, public notices, Town website resources, TextMyGov notifications, social media, Town Hall, permit materials, and coordination with Kane County Emergency Services to share information on emergency alerts, wildfire preparedness, flood and flash flood safety, winter storm readiness, severe weather safety, water system notices, building permits, and hazard-informed land use and zoning decisions.
- **National Flood Insurance Program:** Opportunities to improve or expand NFIP capabilities include continuing to coordinate with Kane County on floodplain management procedures referenced in the capability table, maintaining awareness of the Town's effective Flood Insurance Rate Map (FIRM) and flood risk information, keeping records of drainage or flood-related development concerns, educating residents that flood and flash flood risk can exist outside mapped Special Flood Hazard Areas, and reviewing whether additional local floodplain procedures or public outreach are needed as development, mapping, or flood risk conditions change.

City of Kanab Capability Assessment

Table 153 describes the mitigation capabilities for the City of Kanab.

Table 153: City of Kanab Capability Assessment

Capability	Description
Plans and Regulations	Kanab City General Plan; Land Use Ordinance; General Ordinances; zoning map and zoning matrix; Planning Commission review of land use

Capability	Description
	applications, subdivisions, zoning changes, conditional use permits, and site plans; City Council ordinance and budget authority; Building Department permit review and inspection process through CityInspect; flood damage prevention ordinance; Utah-adopted building codes used as baseline for construction review; fire code coordination through the Fire Chief; grading, excavation, demolition, and building permit processes
Administrative and Technical	City Council; Planning Commission; Land Use Department; Building Department; Zoning Administrator/Building Inspector; Floodplain Administrator; City Manager; City Clerk; public works and streets functions; fire code coordination; land use, subdivision, zoning, conditional use, site plan, grading, excavation, demolition, and building permit review; online permit administration through CityInspect; public meeting and public notice process; coordination with Kane County Emergency Services, Kane County departments, utility providers, and regional partners
Financial	City budgeting processes; FY[236] budget hearings and budget amendments; fee schedule updates; building permit fees; land use, planning, zoning, subdivision, and inspection fees where applicable; online bill pay and online permit payment; impact fees for growth-related infrastructure; local staff time; local match support as available for grants; coordination with Kane County, state, federal, and regional partners for technical and funding assistance; funding support for roads, water, sewer, parks, trails, public safety, wildfire preparedness, drainage, and other mitigation-related infrastructure needs
Education and Outreach	Public notices through the Utah Public Notice Website; City Council and Planning Commission meetings; public hearings for budgets, fees, zoning, land use, and development matters; City website, agendas and minutes, ordinances, forms, FAQs,[237] public notices, document center, and online bill pay resources; Planning and Zoning and Building Department webpages; permit and application guidance; restricted fireworks discharge area information; coordination with Kane County Emergency Services and regional partners for emergency alerts, wildfire preparedness, flood risk, severe weather readiness, safe development practices, and hazard mitigation outreach
National Flood Insurance Program	• **NFIP Status: FEMA lists** Kanab as an NFIP-participating community (Community 490085).[238] • **Community Rating System:** No CRS class is reported in this entry. • **FEMA Effective Map Entry:** The effective-map field is recorded as 08/19/85(M); this is not a local ordinance-adoption date.

[236] FY = fiscal year

[237] FAQs = frequently asked questions

[238] FEMA, OpenFEMA NFIP Community Status Book, Utah records, retrieved October 10, 2026; dataset refresh August 25, 2026. https://www.fema.gov/api/open/v1/NfipCommunityStatusBook. Map dates are FEMA effective-map entries, not evidence of local adoption or implementation.

Capability	Description
	• **Floodplain Administration:** The available records do not establish the current designated administrator or local implementation responsibilities. County participation and procedures do not establish municipal authority.[239] • **Permitting and Enforcement: The available records do not establish local permitting or enforcement implementation. References to Risk MAP in the pl**anning inventory do not document local permit decisions. • **Substantial Improvement/Substantial Damage: Partic**ipant-specific implementation records and repetitive-loss/severe-repetitive-loss building counts and types are not established by the available evidence. No zero count or finding of compliance is inferred.

The following opportunities would expand and improve the City of Kanab mitigation capabilities:

- **Plans and Regulations:** Opportunities to improve or expand planning and regulatory capabilities include continuing to integrate hazard mitigation into the General Plan, Land Use Ordinance, zoning map and zoning matrix, subdivision review, site plan review, conditional use permits, building permit review, grading and excavation permits, floodplain permitting, and future ordinance updates; documenting how reviews consider wildfire, flooding, drainage, problem soils, steep slopes, extreme heat, winter storms, and emergency access; and using the flood damage prevention ordinance to support risk reduction in mapped flood hazard areas.
- **Administrative and Technical:** Opportunities to improve or expand administrative and technical capabilities include documenting City roles for mitigation implementation, strengthening coordination among the City Council, Planning Commission, Land Use Department, Building Department, Zoning Administrator/Building Inspector, Floodplain Administrator, City Manager, public works, fire officials, Kane County Emergency Services, and utility partners, and using available GIS, flood, wildfire, transportation, utility, slope, and problem soil data during development, capital improvement, emergency preparedness, and public infrastructure review.
- **Financial:** Opportunities to improve or expand financial capabilities include identifying potential local match sources for mitigation grants, tracking mitigation-related needs through the annual budget, budget amendment, fee schedule, impact fee, and capital improvement processes, coordinating with Kane County and the Five County Association of Governments on grant opportunities, and aligning local funds with priority actions related to roads, drainage, water, sewer, public safety, wildfire preparedness, emergency access, parks, trails, utilities, and public infrastructure resilience.
- **Education and Outreach:** Opportunities to improve education and outreach capabilities include using public meetings, public hearings, public notices, the City website, agendas and minutes, permit materials, department webpages, restricted fireworks information, and coordination with Kane County Emergency Services to share information on emergency alerts, wildfire preparedness, flood and flash

[239] CFR = Code of Federal Regulations

flood safety, extreme heat safety, winter storm readiness, severe weather safety, building permits, floodplain requirements, safe development practices, and hazard-informed land use decisions.

- **National Flood Insurance Program:** Opportunities to improve or expand NFIP capabilities include maintaining and periodically reviewing the City's flood damage prevention ordinance, keeping floodplain administration and permitting procedures current, maintaining elevation and development permit records, reviewing substantial improvement and substantial damage procedures after events, coordinating with FEMA, the Utah Division of Emergency Management, and Kane County on mapping or flood risk updates, increasing public education about flood risk inside and outside mapped Special Flood Hazard Areas, and evaluating whether CRS participation would be beneficial in the future.

Town of Orderville Capability Assessment

Table 154 describes the mitigation capabilities for the Town of Orderville.

Table 154: Town of Orderville Capability Assessment

Capability	Description
Plans and Regulations	Orderville Town Municipal Code; zoning district regulations and amendments; zoning map; Planning and Zoning Commission review of zoning and land use matters; Town Board ordinance and budget authority; Building Department permit review and inspection process through CityInspect; building permits required for construction, enlargement, alteration, repair, movement, improvement, removal, conversion, or demolition of regulated buildings and structures; adopted building codes including the International Building Code, International Residential Code, National Electrical Code, International Plumbing Code, International Mechanical Code, International Fire Code, and other building codes adopted by the State of Utah; review of snow-load engineering, commercial engineering, retaining walls, fences, demolition, signs, remodels, plumbing, electrical, and structural work where applicable.
Administrative and Technical	Town Board; Mayor; Planning and Zoning Commission; Town Clerk; Town Treasurer; Town Office; Building Inspector; Fire Marshal; Water Operator; building permit administration; online permit and inspection system through CityInspect; zoning and municipal code amendment process; public meeting and public hearing process; coordination with Kane County Emergency Services, Kane County departments, utility providers, public safety partners, and regional partners for emergency preparedness, public works, water system, fire safety, development review, and mitigation implementation support.
Financial	Town budgeting processes; budget public hearings; budget amendments; building permit fees; utility payments; local staff and elected official time; public works and water system project planning; bid notices for infrastructure improvements; local match support as available for grant-supported projects; coordination with Kane County, the Five County Association of Governments, state agencies, federal agencies, and regional partners for technical and funding assistance related to

Capability	Description
	water system improvements, roads, drainage, wildfire preparedness, emergency access, public facilities, and other mitigation-related infrastructure needs.
Education and Outreach	Public notices through the Utah Public Notice Website; Town Board meetings; Planning and Zoning Commission meetings; public hearings for municipal code, zoning, budget, and development matters; Town website news and updates; Town resources, directory, building department, news, and contact pages; TextMyGov town notifications; posted public notices at the Town Office and Orderville Post Office; Town Office contact and permit information; coordination with Kane County Emergency Services and regional partners for emergency alerts, wildfire preparedness, flood and flash flood safety, winter storm readiness, severe weather safety, building permits, water system notices, and hazard mitigation outreach.
National Flood Insurance Program	• **NFIP Status: FEMA lists** Orderville as an NFIP-participating community (Community 490086).[240] • **Community Rating System:** No CRS class is reported in this entry. • **FEMA Effective Map Entry:** No effective-map date is provided in the status-book entry. • **Floodplain Administration:** The available records do not establish the current designated administrator or local implementation responsibilities. County participation and procedures do not establish municipal authority. • **Permitting and Enforcement:** The available records do not establish local permitting or enforcement implementation. References to Risk MAP in the planning inventory do not document local permit decisions. • **Substantial Improvement/Substantial Damage:** Participant-specific implementation records and repetitive-loss/severe-repetitive-loss building counts and types are not established by the available evidence. No zero count or finding of compliance is inferred.

The following opportunities would expand and improve the Town of Orderville mitigation capabilities:

- **Plans and Regulations:** Opportunities to improve or expand planning and regulatory capabilities include incorporating hazard mitigation into municipal code and zoning updates, documenting how building permit review considers wildfire, flooding, drainage, steep slopes, problem soils, snow load, winter access, emergency access, and structural safety, maintaining current building code references, and using the zoning map and Planning and Zoning Commission review process to support hazard-aware land use and development decisions.
- **Administrative and Technical:** Opportunities to improve or expand administrative and technical capabilities include documenting Town roles for mitigation implementation, strengthening coordination among the Town Board, Planning and Zoning Commission, Town Office, Building Inspector, Fire Marshal, Water Operator, Kane County Emergency Services, Kane County departments,

[240] FEMA, OpenFEMA NFIP Community Status Book, Utah records, retrieved October 10, 2026; dataset refresh August 25, 2026. https://www.fema.gov/api/open/v1/NfipCommunityStatusBook. Map dates are FEMA effective-map entries, not evidence of local adoption or implementation.

and utility partners, and using available GIS, flood, wildfire, road, water, slope, and problem soil information during development, public works, water system, emergency preparedness, and mitigation project review.

- **Financial:** Opportunities to improve or expand financial capabilities include identifying potential local match sources for mitigation grants, tracking mitigation-related needs through the annual budget, budget amendment, public works, and water system planning processes, coordinating with Kane County and the Five County Association of Governments on grant opportunities, and aligning limited local funds with priority actions related to water infrastructure, roads, drainage, wildfire preparedness, emergency access, public facilities, and utility resilience.
- **Education and Outreach:** Opportunities to improve education and outreach capabilities include using public meetings, public hearings, public notices, the Town website, TextMyGov notifications, Town Office postings, permit materials, and coordination with Kane County Emergency Services to share information on emergency alerts, wildfire preparedness, flood and flash flood safety, winter storm readiness, severe weather safety, building permits, water system notices, and hazard-informed zoning and development decisions.
- **National Flood Insurance Program:** Opportunities to improve or expand NFIP capabilities include periodically confirming the Town's NFIP status and mapped flood hazard status, coordinating with Kane County, FEMA, and the Utah Division of Emergency Management on floodplain mapping or flood risk information, maintaining records of drainage or flood-related development concerns, educating residents that flood and flash flood risk can exist outside mapped Special Flood Hazard Areas, and evaluating whether future floodplain management procedures are needed if mapping, development, or flood risk conditions change.

Status of Previous Mitigation Actions

Kane County and its communities have participated in previous iterations of the multi-jurisdictional hazard mitigation plan and identified strategies to mitigate natural hazard risks. Describing the status of previous mitigation actions helps demonstrate the ongoing progress made to reduce risk and the communities' commitment to mitigation. At the same time, it serves as an opportunity to evaluate whether an incomplete action is still worth pursuing. The following table preserves prior actions and distinguishes current strategy concepts from implementation status. Dated project records or participant findings are not available to establish completion, continued implementation, or removal.

Table 155 describes progress made on the mitigation actions identified for communities in Kane County in the 2022–2027 hazard mitigation plan.

Table 155: Status of 2022–2027 Mitigation Actions for Kane County

Action Identifier	Action	Status and Explanation
KC-FL-01	Increase the size of culverts along 3 miles of the highway near	Implementation status is not established by dated project or participant records. The

Action Identifier	Action	Status and Explanation
	Mountain View Drive off Chinle Drive of Kanab.	prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
KC-FL-02	Increase the size of culvert at Sand Dunes Road west of Coral Pink Sand Dunes State Park.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
KC-FL-03	Install low water crossings in Vermillion Cliffs Subdivision.[241]	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
KC-FL-04	Install a box culvert at the crossing of House Rock Valley Road at Buckskin Wash.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
KC-FL-05	Develop a roadway infrastructure capital improvement plan.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
KC-FL-06	Participate in flood mapping and the National Flood Insurance Program.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
KC-FL-07	Assess County owned bridges, culverts, and drainage infrastructure for capacity and implement needed improvements.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued

[241] Kane County, Vermillion Cliffs Special Service District FAQ. https://kane.utah.gov/DocumentCenter/View/178/Vermillion-SSD-FAQ-PDF. County usage identifies Vermillion Cliffs Estates Subdivision with a double-l spelling; the historical action name is retained.

Action Identifier	Action	Status and Explanation
		implementation, or participant approval of removal is not inferred.
KC-FL-08	Coordinate with UDOT[242] to assess bridges, culverts, and stormwater drainage infrastructure for capacity along Highway 89.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
KC-DR-01	Preserve economic stability during a drought by encouraging agricultural interests to obtain crop insurance to cover potential losses due to drought.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
KC-DR-02	Replace unused grass areas with native vegetation on County owned property.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
KC-DR-03	Establish drought policies with tiered actions to implement at different severities of drought conditions.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
KC-DR-04	Set standards for development to use drought tolerant and native vegetation.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
KC-SW-01	Educate residents and visitors of the dangers of extreme temperatures (hot and cold) and severe weather events and the steps they can take to protect themselves during an event.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
KC-SW-02	Partner with local cities and towns to identify community structures which could be used as daytime	Implementation status is not established by dated project or participant records. The prior action is retained as a historical

[242] UDOT = Utah Department of Transportation

Action Identifier	Action	Status and Explanation
	cooling centers during extreme heat days in areas of high vulnerability.	planning record; completion, continued implementation, or participant approval of removal is not inferred.
KC-SW-03	Distribution of severe weather information like heat, lightning, and severe thunderstorms to recreation equipment retailers or outfitters to share with their clientele.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
KC-WI-01	Coordinate with fire warden to identify mitigation actions.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
KC-WI-02	Assess critical facilities and County owned property to ensure that materials are flame resistant and landscaping is Firewise.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
KC-EQ-01	Develop an inventory of structures built before seismic code and URM[243] for the county. Educate property owners on seismic safety and retrofits.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
KC-EQ-02	Partner with hospitals, clinics, and other critical facilities to brace generators, elevators, and other vital equipment.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
KC-EQ-03	Require the anchoring of rooftop-mounted equipment, including HVAC units and satellite dishes.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
KC-EQ-04	Use flexible piping when extending water, sewer, or natural gas service.	Implementation status is not established by dated project or participant records. The

[243] URM = unreinforced masonry

Action Identifier	Action	Status and Explanation
		prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
KC-EQ-05	Install window film on county owned property to prevent injuries from shattered glass.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
KC-EQ-06	Develop an outreach program about earthquake risk and mitigation activities in homes, schools, and businesses.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
KC-EQ-07	Require new masonry chimneys greater than 6 feet above a roof to have continuous reinforced steel bracing.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
KC-LS-01	Apply soil stabilization measures, such as planting soil stabilizing vegetation on steep, County owned slopes.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
KC-LS-02	Install catchfall nets for rocks at steep slopes near roadways at Cedar Mountain over Highway 14.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
KC-LS-03	Inventory and identify catch-fall nets for rocks at steep slopes near roadways on Highway 89.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
KC-LS-04	Develop a plan for revegetation of steep slopes following a natural hazard like a debris flow, landslide,	Implementation status is not established by dated project or participant records. The prior action is retained as a historical

Action Identifier	Action	Status and Explanation
	flood, or wildfire which has damaged the existing vegetation.	planning record; completion, continued implementation, or participant approval of removal is not inferred.
KC-PS-01	Work with the Utah Geological Survey to update problem soil mapping.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
KC-PS-02	Inventory locations where problem soils have caused damages to properties in the County.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
KC-RN-01	Provide radon risk, testing, and mitigation information to residents.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
KC-RN-02	Partner with the County School District to complete tests in Kane County Schools.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
ORD-DR-01	Encourage permeable driveways and surfaces to promote groundwater recharge.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
ORD-DR-02	Preserve economic stability during a drought by encouraging agricultural interests to obtain crop insurance to cover potential losses due to drought. Provide information at town office.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
ORD-DR-03	Assess town facilities and, where identified, replace unused grass areas with native vegetation on town owned property.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued

Action Identifier	Action	Status and Explanation
		implementation, or participant approval of removal is not inferred.
ORD-DR-04	Establish drought policies with tiered actions to implement at different severities of drought conditions.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
ORD-DR-05	Assess and identify capacity for town infrastructure to install redundancies and harden the water system in the town.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
ORD-DR-06	Set standards for development to use drought tolerant and native vegetation.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
ORD-SW-01	Educate residents and visitors of the dangers of extreme temperatures and severe weather events and the steps they can take to protect themselves during an event. Information to be available at the town office.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
ORD-SW-02	Partner with local cities and towns to identify community structures which could be used as daytime cooling centers during extreme heat days in areas of high vulnerability.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
ORD-SW-03	Distribution of severe weather information like heat, lightning, and severe thunderstorms to recreation equipment retailers or outfitters to share with their clientele.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
ORD-SW-04	Install and maintain surge protection on critical electronic equipment at town operated facilities.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued

Action Identifier	Action	Status and Explanation
		implementation, or participant approval of removal is not inferred.
ORD-EQ-01	Partner with hospitals, clinics, and other critical facilities to brace generators, elevators, and other vital equipment.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
ORD-EQ-02	Require the anchoring of rooftop-mounted equipment, including HVAC units and satellite dishes.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
ORD-EQ-03	Use flexible piping when extending water, sewer, or natural gas service.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
ORD-EQ-04	Install window film on town owned property to prevent injuries from shattered glass.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
ORD-EQ-05	Develop an outreach program about earthquake risk and mitigation activities in homes, schools, and businesses, available at the town office and town outreach events.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
ORD-EQ-06	Require new masonry chimneys greater than 6 feet above a roof to have continuous reinforced steel bracing.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
ORD-EQ-07	Educate homeowners on safety techniques to follow during and after an earthquake.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued

Action Identifier	Action	Status and Explanation
		implementation, or participant approval of removal is not inferred.
ORD-EQ-08	Inventory structures in the town that are constructed with unreinforced masonry and plan for retrofit of structures for the safety of occupants.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
ORD-FL-01	Maintain and clean drainages and culverts in the town.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
ORD-FL-02	Participate in flood mapping and the National Flood Insurance Program.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
ORD-FL-03	Limit the percentage of allowable impervious surface within developed parcels in high flood risk areas.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
ORD-FL-04	Require developers to construct on-site retention basins for excessive stormwater and as a firefighting water source.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
ORD-FL-05	Increase drainage or absorption capacities with detention and retention basins, relief drains, spillways, drain widening/dredging or rerouting, logjam and debris removal, extra culverts, bridge modification, dike setbacks, flood gates and pumps, or channel redirection.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
ORD-FL-06	Work with utility companies to raise utilities or other mechanical	Implementation status is not established by dated project or participant records. The

Action Identifier	Action	Status and Explanation
	devices above expected flood levels.	prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
ORD-FL-07	Coordinate with UDOT to assess bridges, culverts, and stormwater drainage infrastructure for capacity along Highway 89.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
ORD-FL-08	Partner with park rangers, outdoor outfitters and other recreation industry partners to inform visitors of the flood hazard risks.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
ORD-WI-01	Adopt the Wildland Urban Interface Code.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
ORD-WI-02	Use zoning and/or a special wildfire overlay district to designate high-risk areas and specify the conditions for the use and development of specific areas.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
ORD-WI-03	Encourage the use of noncombustible materials, including stone, brick, and stucco, for new construction and renovations in wildfire hazard areas.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
ORD-WI-04	Coordinate yard clean ups and education about defensible space on personal property and Firewise landscaping in unincorporated and incorporated communities.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
ORD-WI-05	Complete fuels management on town-owned land and support efforts from partnering agencies	Implementation status is not established by dated project or participant records. The prior action is retained as a historical

Action Identifier	Action	Status and Explanation
	including BLM,[244] NPS,[245] DNR,[246] and other local, state, or federal agencies.	planning record; completion, continued implementation, or participant approval of removal is not inferred.
ORD-WI-06	Require that large propane tanks or other external fuel sources have protective measures.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
ORD-WI-07	Coordinate with local utility providers to mitigate hazardous fuels around utility infrastructure.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
ORD-WI-08	Assess critical facilities to ensure that materials are flame resistant and landscaping is Firewise.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
ORD-LS-01	Apply soil stabilization measures, such as planting soil stabilizing vegetation on steep, town-owned slopes.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
ORD-LS-02	Use debris-flow measures that may reduce damage in sloping areas, such as stabilization, energy dissipation, and flow control measures.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
ORD-LS-03	Establish setback requirements and use large setbacks when building roads near slopes of marginal stability.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.

[244] BLM = Bureau of Land Management
[245] NPS = National Park Service
[246] DNR = Utah Department of Natural Resources

Action Identifier	Action	Status and Explanation
ORD-LS-04	Coordinate with the County and UDOT to assess the need for and install catch-fall nets for steep slopes on vulnerable roadways.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
ORD-LS-05	Develop a plan for revegetation of steep slopes following a natural hazard like a debris flow, landslide, flood, or wildfire which has damaged the existing vegetation.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
ORD-RN-01	Provide radon risk, testing, and mitigation information to residents.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
ORD-RN-02	Partner with the County School District to complete tests in Kane County Schools.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
ORD-PS-01	Work with the Utah Geological Survey to update problem soil mapping.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
ORD-PS-02	Inventory locations where problem soils have caused damages to properties in the town.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
ORD-PS-03	Require soils survey for all new development to identify problem soils.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.

Action Identifier	Action	Status and Explanation
BW-DR-01	Complete the ongoing Water Table Study and use findings to improve local conservation and drought mitigation efforts.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
BW-FL-01	Coordinate with UDOT and Kane County to assess culverts under Highway-89 for capacity and debris clearing to prevent roadway flooding on critical infrastructure.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
BW-SW-01	Require in Town Code that developers engage in stormwater infrastructure development, like curb and gutter, swales, retention basins, etc.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
BW-LS-01	Coordinate with BLM and National Park Service to assess slopes which may cause flooding in drainages or on the creek near town.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
BW-WI-01	Annually, during town yard clean ups, provide residents public information about fire mitigation on personal property. Include notice in utility billings and on site from fire department/Kane County Emergency Management.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
BW-EQ-01	Annually, in utility billings, send residents information about earthquake safety and preparedness needs locally.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.
BW-RN-01	Inform the public of radon gas risks, testing, and mitigation techniques using Town website and social media.	Implementation status is not established by dated project or participant records. The prior action is retained as a historical planning record; completion, continued implementation, or participant approval of removal is not inferred.

Mitigation Goals

The communities of Kane County approve the identification of the mitigation goals for the Five County Region as outlined in the base plan including:

- **Goal 1: Protect Life and Property**
- Objective: Reduce injury, loss of life, and damage to existing and future development through feasible mitigation measures.
- **Goal 2: Protect Critical Facilities, Infrastructure, and Community Lifelines**
- Objective: Protect critical facilities, infrastructure systems, and community lifelines and improve continuity of essential services.
- **Goal 3: Strengthen Public Education and Risk Communication**
- Objective: Increase public understanding of hazards, risk-reduction options, warnings, and protective actions.
- **Goal 4: Strengthen Partnerships and Coordination**
- Objective: Strengthen intergovernmental, public-private, and community partnerships that support coordinated mitigation implementation.
- **Goal 5: Strengthen the Resilience of Emergency Services**
- Objective: Improve the capability, continuity, redundancy, and resilience of emergency services before, during, and after hazard events.
- **Goal 6: Protect and Use Natural Systems**
- Objective: Protect and use natural systems and nature-based approaches where feasible to reduce hazard impacts and support community resilience.

2027–2032 Mitigation Action Plan for Kane County

Participating jurisdictions within Kane County reviewed the regional mitigation action catalog and selected the actions most appropriate to their identified risks, vulnerabilities, capabilities, and development trends. Table 156 identifies the actions selected by each jurisdiction. The selected actions address the hazards prioritized in the county and community risk assessments and support achievement of the regional mitigation goals. Each participant has at least one action for each hazard carried forward in Table 133. Section 6.2 of the base plan is incorporated by reference and provides full action descriptions, hazards addressed, goals, responsible parties, funding sources, timeframes, costs, priorities, and regional prioritization based on STAPLEE (social, technical, administrative, political, legal, economic, and environmental) criteria.

Table 156: Kane County Jurisdiction Action Selection Matrix

Mitigation Action	Action Description	Jurisdictions
FCA-DF-01	Update dam-failure warning, evacuation, and public-information procedures for inundation areas.	City of Kanab; Town of Alton; Town of Big Water; Town of Glendale; Town of Orderville; Unincorporated Kane County
FCA-DR-01	Prepare or update a drought-response and water-shortage plan with staged triggers and conservation measures.	City of Kanab; Town of Alton; Town of Big Water; Town of Glendale; Town of Orderville; Unincorporated Kane County
FCA-DR-03	Reduce water demand through leak detection, efficient fixtures, irrigation upgrades, turf replacement, and waterwise landscaping.	Town of Orderville; Unincorporated Kane County
FCA-DR-04	Support agricultural drought resilience through irrigation efficiency, soil-moisture conservation, drought-tolerant practices, producer outreach, and promotion of applicable crop insurance.	Unincorporated Kane County
FCA-DW-01	Assess and retrofit vulnerable buildings, roofs, signs, rooftop equipment, communications, and utilities for wind loads.	City of Kanab; Town of Alton; Town of Big Water; Town of Glendale; Town of Orderville; Unincorporated Kane County
FCA-EH-02	Develop a heat-response protocol using forecast triggers, facility hours, transportation options, and targeted notifications.	City of Kanab; Town of Alton; Town of Big Water; Town of Glendale; Town of Orderville; Unincorporated Kane County
FCA-EH-03	Develop and publish a current list of public cooling locations and operating procedures for activation during severe heat events.	Town of Orderville; Unincorporated Kane County
FCA-EQ-01	Inventory and evaluate unreinforced masonry, older public buildings, schools, and critical facilities for retrofit.	City of Kanab; Town of Alton; Town of Big Water; Town of Glendale; Town of Orderville; Unincorporated Kane County
FCA-EQ-02	Apply seismic codes, flexible utility connections, and equipment anchorage during construction and replacement.	Town of Orderville; Unincorporated Kane County

Mitigation Action	Action Description	Jurisdictions
FCA-EQ-03	Provide recurring earthquake-risk and nonstructural-mitigation outreach.	Town of Big Water; Town of Orderville; Unincorporated Kane County
FCA-EQ-05	Install safety film or other protective glazing treatments in priority public and critical facilities to reduce injuries from shattered glass during earthquakes.	Town of Orderville; Unincorporated Kane County
FCA-FL-01	Prepare or update stormwater and drainage master plans and inventory culverts, bridges, washes, and detention facilities.	City of Kanab; Town of Alton; Town of Big Water; Town of Glendale; Town of Orderville; Unincorporated Kane County
FCA-FL-03	Inspect and maintain drainage channels, culverts, detention facilities, and bridge openings.	Town of Big Water; Town of Orderville
FCA-FL-04	Strengthen floodplain, erosion-hazard, riparian-setback, and stormwater standards for development.	Town of Big Water; Town of Orderville
FCA-FL-06	Assess detention basins and river or wash crossings at identified priority locations; repair, expand, or replace deficient infrastructure based on findings.	Unincorporated Kane County
FCA-FL-07	Participate in FEMA Risk MAP,[247] local flood-hazard mapping, and National Flood Insurance Program activities; provide residents and property owners with current flood-risk and NFIP information.	Town of Orderville; Unincorporated Kane County
FCA-FL-08	Install, improve, or replace low-water crossings, flash-flood warning signs, and roadway drainage controls at documented flood-prone routes.	Unincorporated Kane County
FCA-FL-09	Develop or update a roadway infrastructure capital improvement plan that prioritizes flood-prone culverts, bridges, crossings, and drainage projects.	Unincorporated Kane County

[247] Risk MAP = Risk Mapping, Assessment, and Planning

Mitigation Action	Action Description	Jurisdictions
FCA-FL-10	Design and construct sediment and debris basins, relief drains, spillways, floodways, or other flow-control facilities to delay, meter, store, or safely convey severe runoff.	Town of Orderville
FCA-HA-01	Evaluate hail exposure and use impact-resistant roofing, glazing, and equipment protection during replacement or construction.	City of Kanab; Town of Alton; Town of Big Water; Town of Glendale; Town of Orderville; Unincorporated Kane County
FCA-LS-01	Map, monitor, and evaluate landslide, rockfall, and debris-flow areas affecting development and infrastructure.	City of Kanab; Town of Alton; Town of Big Water; Town of Glendale; Town of Orderville; Unincorporated Kane County
FCA-LS-02	Require geotechnical investigation, slope analysis, setbacks, and engineered mitigation near unstable slopes.	Town of Orderville
FCA-LS-03	Stabilize priority public slopes and burn scars using drainage, revegetation, erosion control, or engineered treatments.	Town of Orderville; Unincorporated Kane County
FCA-LS-06	Install or upgrade rockfall catchment systems, barriers, nets, benches, or related slope-protection measures at documented roadway and infrastructure exposure locations.	Town of Orderville; Unincorporated Kane County
FCA-PS-01	Require subsurface geotechnical investigation and foundation recommendations where problem soils may affect structures.	City of Kanab; Town of Alton; Town of Big Water; Town of Glendale; Town of Orderville; Unincorporated Kane County
FCA-PS-02	Update problem-soil mapping and inventory locations where soil conditions have damaged assets.	Town of Orderville; Unincorporated Kane County
FCA-RN-01	Provide recurring radon-risk, testing, and mitigation information through public and partner channels.	City of Kanab; Town of Alton; Town of Big Water; Town of Glendale; Town of Orderville; Unincorporated Kane County
FCA-RN-02	Test public facilities for radon and mitigate where results exceed applicable action levels.	Town of Orderville; Unincorporated Kane County

Mitigation Action	Action Description	Jurisdictions
FCA-TL-01	Install lightning and surge protection, grounding, backup power, and communications safeguards at critical facilities.	City of Kanab; Town of Alton; Town of Big Water; Town of Glendale; Town of Orderville; Unincorporated Kane County
FCA-TL-02	Use alerts, signage, and operating procedures at parks, schools, pools, events, and exposed outdoor locations.	Unincorporated Kane County
FCA-TO-01	Maintain tornado and severe-thunderstorm alerts, shelter guidance, and protective-action messaging.	City of Kanab; Town of Alton; Town of Big Water; Town of Glendale; Town of Orderville; Unincorporated Kane County
FCA-WI-01	Adopt or update Wildland-Urban Interface standards for defensible space, access, water supply, and ignition-resistant construction.	City of Kanab; Town of Alton; Town of Big Water; Town of Glendale; Town of Orderville; Unincorporated Kane County
FCA-WI-02	Inventory and reduce hazardous fuels around critical facilities, utilities, roads, and community boundaries.	Town of Orderville; Unincorporated Kane County
FCA-WI-06	Coordinate recurring community cleanup, mechanical thinning, vegetation maintenance, and irrigation-ditch fuel reduction in wildland-urban interface areas.	Town of Big Water; Town of Orderville
FCA-WS-01	Prioritize snow and ice control routes serving critical facilities, schools, and isolated communities.	City of Kanab; Town of Alton; Town of Big Water; Town of Glendale; Town of Orderville; Unincorporated Kane County

Action Selection and Analysis

Participants considered regulatory, structural and infrastructure, natural-systems, education and awareness, and capability-building alternatives. Selections were screened against participant-specific risk and vulnerability, development trends, available capabilities, feasibility, cost and expected benefit, environmental effects, support, funding potential, and implementation timeframe.

Plan Integration

Plan integration is the process of incorporating information from the hazard mitigation plan into other planning mechanisms or the governance structures that manage long-term community development and

decision-making, including budgets, comprehensive plans, economic development strategies, and other long-range planning documents. Plan integration helps promote mitigation project implementation by incorporating data and actions across programs and day-to-day operations.

Integration of the 2022–2027 Plan

The plan participants reviewed integration of the prior plan as shown in Table 157.

Table 157: Kane County Integration of the 2022–2027 Plan

Plan Participant	Description
Unincorporated Kane County	Unincorporated Kane County reviewed the prior plan for use in planning, development review, infrastructure decisions, budgeting, emergency management coordination, outreach, and project development, as applicable to local authority and capability. Specific prior-plan integration examples were not verified in the available records. Annual monitoring will document future integration decisions and examples.
Town of Alton	Town of Alton reviewed the prior plan for use in planning, development review, infrastructure decisions, budgeting, emergency management coordination, outreach, and project development, as applicable to local authority and capability. Specific prior-plan integration examples were not verified in the available records. Annual monitoring will document future integration decisions and examples.
Town of Big Water	Town of Big Water reviewed the prior plan for use in planning, development review, infrastructure decisions, budgeting, emergency management coordination, outreach, and project development, as applicable to local authority and capability. Specific prior-plan integration examples were not verified in the available records. Annual monitoring will document future integration decisions and examples.
Town of Glendale	Town of Glendale reviewed the prior plan for use in planning, development review, infrastructure decisions, budgeting, emergency management coordination, outreach, and project development, as applicable to local authority and capability. Specific prior-plan integration examples were not verified in the available records. Annual monitoring will document future integration decisions and examples.
City of Kanab	City of Kanab reviewed the prior plan for use in planning, development review, infrastructure decisions, budgeting, emergency management coordination, outreach, and project development, as applicable to local authority and capability. Specific prior-plan integration examples were not verified in the

Plan Participant	Description
	available records. Annual monitoring will document future integration decisions and examples.
Town of Orderville	Town of Orderville reviewed the prior plan for use in planning, development review, infrastructure decisions, budgeting, emergency management coordination, outreach, and project development, as applicable to local authority and capability. Specific prior-plan integration examples were not verified in the available records. Annual monitoring will document future integration decisions and examples.

Integration of the 2027–2032 Plan

The plan participants identified opportunities to integrate the 2027–2032 plan into other planning mechanisms, as documented in Table 158.

Table 158: Kane County Integration of the 2027–2032 Plan

Plan Participant	Description
Unincorporated Kane County	During annual monitoring, Unincorporated Kane County will review mitigation actions with applicable planning, public works, utility, emergency management, building, floodplain, finance, and elected functions. Relevant hazards and actions will be evaluated during updates to plans, ordinances, budgets, capital programs, development reviews, and outreach materials. Responsible functions will identify applicable integration opportunities and document implementation decisions, including actions integrated, deferred, or not advanced, through annual monitoring records. Integration will be considered in plans, ordinances, development review, infrastructure planning, budgeting, emergency management, and capital improvement programming, as applicable to local authority and capability.
Town of Alton	During annual monitoring, Town of Alton will review mitigation actions with applicable planning, public works, utility, emergency management, building, floodplain, finance, and elected functions. Relevant hazards and actions will be evaluated during updates to plans, ordinances, budgets, capital programs, development reviews, and outreach materials. Responsible functions will identify applicable integration opportunities and document implementation decisions, including actions integrated, deferred, or not advanced, through annual monitoring records. Integration will be considered in plans, ordinances, development review, infrastructure planning, budgeting, emergency management, and capital improvement programming, as applicable to local authority and capability.
Town of Big Water	During annual monitoring, Town of Big Water will review mitigation actions with applicable planning, public works, utility, emergency management, building,

Plan Participant	Description
	floodplain, finance, and elected functions. Relevant hazards and actions will be evaluated during updates to plans, ordinances, budgets, capital programs, development reviews, and outreach materials. Responsible functions will identify applicable integration opportunities and document implementation decisions, including actions integrated, deferred, or not advanced, through annual monitoring records. Integration will be considered in plans, ordinances, development review, infrastructure planning, budgeting, emergency management, and capital improvement programming, as applicable to local authority and capability.
Town of Glendale	During annual monitoring, Town of Glendale will review mitigation actions with applicable planning, public works, utility, emergency management, building, floodplain, finance, and elected functions. Relevant hazards and actions will be evaluated during updates to plans, ordinances, budgets, capital programs, development reviews, and outreach materials. Responsible functions will identify applicable integration opportunities and document implementation decisions, including actions integrated, deferred, or not advanced, through annual monitoring records. Integration will be considered in plans, ordinances, development review, infrastructure planning, budgeting, emergency management, and capital improvement programming, as applicable to local authority and capability.
City of Kanab	During annual monitoring, City of Kanab will review mitigation actions with applicable planning, public works, utility, emergency management, building, floodplain, finance, and elected functions. Relevant hazards and actions will be evaluated during updates to plans, ordinances, budgets, capital programs, development reviews, and outreach materials. Responsible functions will identify applicable integration opportunities and document implementation decisions, including actions integrated, deferred, or not advanced, through annual monitoring records. Integration will be considered in plans, ordinances, development review, infrastructure planning, budgeting, emergency management, and capital improvement programming, as applicable to local authority and capability.
Town of Orderville	During annual monitoring, Town of Orderville will review mitigation actions with applicable planning, public works, utility, emergency management, building, floodplain, finance, and elected functions. Relevant hazards and actions will be evaluated during updates to plans, ordinances, budgets, capital programs, development reviews, and outreach materials. Responsible functions will identify applicable integration opportunities and document implementation decisions, including actions integrated, deferred, or not advanced, through annual monitoring records. Integration will be considered in plans, ordinances, development review, infrastructure planning, budgeting, emergency management, and capital improvement programming, as applicable to local authority and capability.

Continued Public Involvement

The plan participants are committed to implementing the plan maintenance process outlined in the base plan. At the same time, they have evaluated their own opportunities to ensure the public has an opportunity to be involved in the plan maintenance and update process. Table 159 shows the **continued public involvement** approach for each plan participant.

Table 159: Continued Public Involvement Approach for Kane County

Plan Participant	Approach
Unincorporated Kane County	At least annually, during future amendments, and as part of the five-year plan update, Unincorporated Kane County will use official public notices, public meetings, jurisdiction websites, email, social media, electronic alerts or other available communication methods, and coordination with Kane County and FCAOG to share implementation updates and draft materials; advertise public review opportunities; collect written, electronic, and meeting comments; and document comments received, how they were considered, and resulting plan decisions.
Town of Alton	At least annually, during future amendments, and as part of the five-year plan update, Town of Alton will use official public notices, public meetings, jurisdiction websites, email, social media, electronic alerts or other available communication methods, and coordination with Kane County and FCAOG to share implementation updates and draft materials; advertise public review opportunities; collect written, electronic, and meeting comments; and document comments received, how they were considered, and resulting plan decisions.
Town of Big Water	At least annually, during future amendments, and as part of the five-year plan update, Town of Big Water will use official public notices, public meetings, jurisdiction websites, email, social media, electronic alerts or other available communication methods, and coordination with Kane County and FCAOG to share implementation updates and draft materials; advertise public review opportunities; collect written, electronic, and meeting comments; and document comments received, how they were considered, and resulting plan decisions.
Town of Glendale	At least annually, during future amendments, and as part of the five-year plan update, Town of Glendale will use official public notices, public meetings, jurisdiction websites, email, social media, electronic alerts or other available communication methods, and coordination with Kane County and FCAOG to share implementation updates and draft materials; advertise public review opportunities; collect written, electronic, and meeting comments; and document comments received, how they were considered, and resulting plan decisions.

Plan Participant	Approach
City of Kanab	At least annually, during future amendments, and as part of the five-year plan update, City of Kanab will use official public notices, public meetings, jurisdiction websites, email, social media, electronic alerts or other available communication methods, and coordination with Kane County and FCAOG to share implementation updates and draft materials; advertise public review opportunities; collect written, electronic, and meeting comments; and document comments received, how they were considered, and resulting plan decisions.
Town of Orderville	At least annually, during future amendments, and as part of the five-year plan update, Town of Orderville will use official public notices, public meetings, jurisdiction websites, email, social media, electronic alerts or other available communication methods, and coordination with Kane County and FCAOG to share implementation updates and draft materials; advertise public review opportunities; collect written, electronic, and meeting comments; and document comments received, how they were considered, and resulting plan decisions.

Washington County Annex

County Profile

Washington County is located in the far southwestern corner of Utah, bordering Arizona, Nevada, Iron County, and Kane County. The county contains about 2,428 square miles of land and serves as the regional population, employment, medical, education, and transportation hub for Utah's Dixie. The county seat is St. George, which anchors a rapidly growing urbanized area that also includes Washington City, Hurricane, Santa Clara, Ivins, and La Verkin, while smaller communities such as Enterprise, Toquerville, Leeds, Virgin, Springdale, New Harmony, Rockville, Apple Valley, and Hildale contribute distinct rural, gateway, and agricultural characteristics. Unincorporated communities such as Dammeron Valley, Pine Valley, Veyo, and Central are also important to the county's settlement pattern and hazard exposure. This profile summarizes the county's physical setting, development pattern, population, housing, economy, and community systems in order to support the hazard-specific risk assessment and mitigation strategy.[248]

[248] U.S. Census Bureau, Washington County, Utah profile: 2,427.6 square miles of land area and bordering counties. https://data.census.gov/profile/Washington_County,_Utah?g=050XX00US49053. Accessed October 9, 2026.

Geographic Setting and Communities

Washington County spans a diverse landscape of Mojave Desert lowlands, red rock canyons, mesas, river valleys, and upland mountain areas. Elevations and terrain vary significantly from the developed St. George urban area and Virgin River corridor to higher elevation communities such as Enterprise, New Harmony, Pine Valley, and Veyo. Interstate 15 is the county's principal regional transportation corridor and connects the county to the Wasatch Front, Las Vegas, and Arizona. State routes and local arterials connect the county's incorporated municipalities and gateway communities, including those serving Zion National Park, Snow Canyon State Park, and other recreation destinations. Development is concentrated in the greater St. George area and along the Hurricane Valley and Virgin River corridor, while outlying communities retain more rural land use patterns, lower-density residential development, agricultural uses, and greater dependence on limited roadway access. This geographic diversity contributes to varying exposure to flooding, wildfire, drought, problem soils, landslides, winter weather, and extreme heat across the county's jurisdictions.

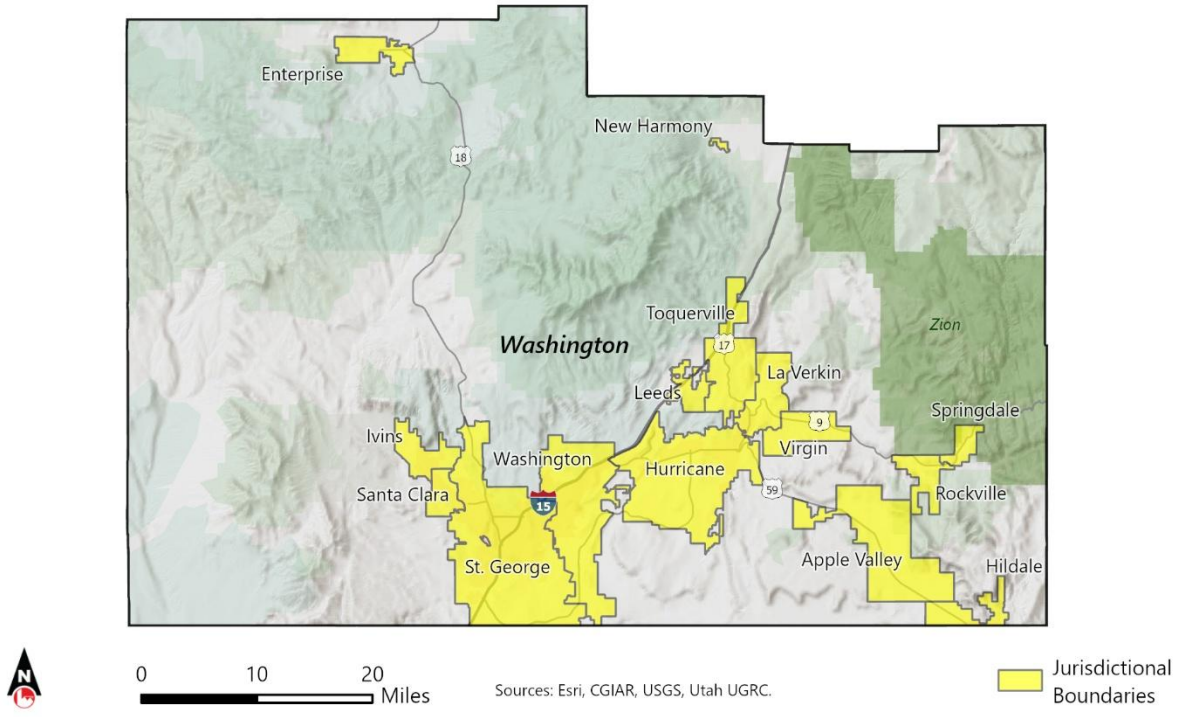


Figure 54: Map of Washington County and Incorporated Jurisdictions

Population and Housing

Washington County's population increased from 180,279 in the 2020 Census to an estimated 213,670 on July 1, 2025, 18.5% above the 2020 estimates base. The county had an estimated 91,460 housing units in 2025 and approximately 69,786 households in 2020–2024. Persons age 65 or older represented 22.4% of the population. These countywide characteristics inform planning for warning, evacuation, sheltering,

continuity, and recovery; they do not represent direct exposure to a particular hazard without a mapped or otherwise documented hazard area.[249]

Economy and Critical Infrastructure

The county economy is driven by construction, real estate, tourism, health care, education, trade, and service industries, with regional assets that include Zion National Park visitation, recreation-based commerce, Utah Tech University, local schools, and major medical facilities in the St. George area. Countywide economic output exceeded $8 billion in 2023 and continued to grow with strong population gains and development activity.[250] Critical infrastructure includes Interstate 15, regional highways, bridges and river crossings, local roadway networks, water delivery and storage systems, wastewater facilities, storm drainage systems, electric and communications infrastructure, public safety facilities, schools, and health care facilities. The county is also served by St. George Regional Airport and supports a network of public buildings, emergency services, utility corridors, and parks that are essential for continuity of operations and post-disaster recovery. Rural and gateway communities may rely on fewer transportation links, localized water systems, and limited redundant infrastructure, which can heighten disruption during hazard events.



Figure 55: Economic Growth in Washington County[251]

Land Use, Planning, and Mitigation Context

Land use in Washington County ranges from urban and suburban development in the greater St. George area to agricultural, open space, recreation, and low-density rural residential uses in unincorporated areas and smaller municipalities. The county and its communities use general plans, zoning, subdivision regulations, building codes, transportation planning, utility corridor planning, and capital improvements programming to guide growth and manage risk. Washington County has adopted a general plan and transportation planning documents, and many participating jurisdictions maintain their own local plans and development regulations.

In Washington County, continued population growth, expansion into hazard-prone areas, increasing pressure on water resources, and the need to protect critical facilities and transportation corridors all

[249] U.S. Census Bureau, QuickFacts: Washington County, Utah, V2025 population and housing estimates, 2020 Census, and 2020-2024 ACS. https://www.census.gov/quickfacts/fact/table/washingtoncountyutah/PST045225. Accessed October 9, 2026. Countywide totals are planning context, not mapped hazard exposure.
[250] Utah.gov., Online Library, "National Association of Counties, County Economies 2025 Profiles-Washington County Utah," 2025, https://onlinelibrary.utah.gov/wp-content/uploads/washington_county_NACo_economy.pdf.
[251] Utah.gov., Online Library, "National Association of Counties, County Economies 2025 Profiles-Washington County Utah," 2025, https://onlinelibrary.utah.gov/wp-content/uploads/washington_county_NACo_economy.pdf.

shape the mitigation context. The county's mix of rapidly urbanizing municipalities, rural communities, and recreation gateway towns requires mitigation actions that are coordinated regionally while remaining tailored to local conditions and jurisdiction-specific risks.

Hazard Identification

Each plan participant reviewed the hazards identified for the Five County Region and determined their applicability. Table 160 indicates that all profiled hazards apply to each Washington County participant; therefore, no participant-specific hazard omissions are proposed.

Table 160: Hazard Applicability for Washington County Participants

Plan Participant	Hazard	Rationale for Omitting Hazard
Washington County	Dam Failure, Damaging Winds, Drought, Earthquake, Extreme Heat, Flooding, Hail, Landslide, Problem Soils, Radon Gas, Thunderstorms and Lightning, Tornadoes, Wildfire, Winter Storms	No participant-specific omission; all profiled hazards are applicable.
St. George	Dam Failure, Damaging Winds, Drought, Earthquake, Extreme Heat, Flooding, Hail, Landslide, Problem Soils, Radon Gas, Thunderstorms and Lightning, Tornadoes, Wildfire, Winter Storms	No participant-specific omission; all profiled hazards are applicable.
Washington City	Dam Failure, Damaging Winds, Drought, Earthquake, Extreme Heat, Flooding, Hail, Landslide, Problem Soils, Radon Gas, Thunderstorms and Lightning, Tornadoes, Wildfire, Winter Storms	No participant-specific omission; all profiled hazards are applicable.
Hurricane	Dam Failure, Damaging Winds, Drought, Earthquake, Extreme Heat, Flooding, Hail, Landslide, Problem Soils, Radon Gas, Thunderstorms and Lightning, Tornadoes, Wildfire, Winter Storms	No participant-specific omission; all profiled hazards are applicable.
Santa Clara	Dam Failure, Damaging Winds, Drought, Earthquake, Extreme Heat, Flooding, Hail, Landslide, Problem Soils, Radon Gas, Thunderstorms and Lightning, Tornadoes, Wildfire, Winter Storms	No participant-specific omission; all profiled hazards are applicable.
Ivins	Dam Failure, Damaging Winds, Drought, Earthquake, Extreme Heat, Flooding, Hail, Landslide, Problem	No participant-specific omission; all profiled hazards are applicable.

Plan Participant	Hazard	Rationale for Omitting Hazard
	Soils, Radon Gas, Thunderstorms and Lightning, Tornadoes, Wildfire, Winter Storms	
La Verkin	Dam Failure, Damaging Winds, Drought, Earthquake, Extreme Heat, Flooding, Hail, Landslide, Problem Soils, Radon Gas, Thunderstorms and Lightning, Tornadoes, Wildfire, Winter Storms	No participant-specific omission; all profiled hazards are applicable.
Enterprise	Dam Failure, Damaging Winds, Drought, Earthquake, Extreme Heat, Flooding, Hail, Landslide, Problem Soils, Radon Gas, Thunderstorms and Lightning, Tornadoes, Wildfire, Winter Storms	No participant-specific omission; all profiled hazards are applicable.
Toquerville	Dam Failure, Damaging Winds, Drought, Earthquake, Extreme Heat, Flooding, Hail, Landslide, Problem Soils, Radon Gas, Thunderstorms and Lightning, Tornadoes, Wildfire, Winter Storms	No participant-specific omission; all profiled hazards are applicable.
Leeds	Dam Failure, Damaging Winds, Drought, Earthquake, Extreme Heat, Flooding, Hail, Landslide, Problem Soils, Radon Gas, Thunderstorms and Lightning, Tornadoes, Wildfire, Winter Storms	No participant-specific omission; all profiled hazards are applicable.
Virgin	Dam Failure, Damaging Winds, Drought, Earthquake, Extreme Heat, Flooding, Hail, Landslide, Problem Soils, Radon Gas, Thunderstorms and Lightning, Tornadoes, Wildfire, Winter Storms	No participant-specific omission; all profiled hazards are applicable.
Springdale	Dam Failure, Damaging Winds, Drought, Earthquake, Extreme Heat, Flooding, Hail, Landslide, Problem Soils, Radon Gas, Thunderstorms and Lightning, Tornadoes, Wildfire, Winter Storms	No participant-specific omission; all profiled hazards are applicable.
New Harmony	Dam Failure, Damaging Winds, Drought, Earthquake, Extreme Heat, Flooding, Hail, Landslide, Problem Soils, Radon Gas, Thunderstorms and Lightning, Tornadoes, Wildfire, Winter Storms	No participant-specific omission; all profiled hazards are applicable.
Rockville	Dam Failure, Damaging Winds, Drought, Earthquake, Extreme Heat, Flooding, Hail, Landslide, Problem	No participant-specific omission; all profiled hazards are applicable.

Plan Participant	Hazard	Rationale for Omitting Hazard
	Soils, Radon Gas, Thunderstorms and Lightning, Tornadoes, Wildfire, Winter Storms	
Apple Valley	Dam Failure, Damaging Winds, Drought, Earthquake, Extreme Heat, Flooding, Hail, Landslide, Problem Soils, Radon Gas, Thunderstorms and Lightning, Tornadoes, Wildfire, Winter Storms	No participant-specific omission; all profiled hazards are applicable.
Hildale	Dam Failure, Damaging Winds, Drought, Earthquake, Extreme Heat, Flooding, Hail, Landslide, Problem Soils, Radon Gas, Thunderstorms and Lightning, Tornadoes, Wildfire, Winter Storms	No participant-specific omission; all profiled hazards are applicable.

Vulnerability and Impact Assessment

The vulnerability and impact assessment identifies the people, structures, critical facilities, infrastructure systems, economic activities, natural resources, and other community assets that may be affected by each applicable hazard. Countywide population, housing, facility, and infrastructure figures provide planning context and should not be interpreted as direct hazard exposure unless supported by a mapped footprint, scenario, or documented event. The regional hazard profiles provide hazard characteristics, location, extent, previous occurrences, probability, methodology, and future conditions; this annex supplements those profiles with participant-specific consequences and planning considerations. Facility and infrastructure entries are qualitative planning considerations drawn from the annex inventory. They identify asset types and potential service consequences; they do not represent a verified complete current inventory, a mapped exposure count, or a modeled loss estimate. Inclusion in a county or municipality does not establish that a facility lies within a particular hazard footprint.

Dam Failure

Table 161 summarizes dam failure vulnerabilities and potential impacts for Washington County participants.

Table 161: Dam Failure Vulnerability and Impact Assessment for Washington County

Plan Participant	Vulnerabilities and Impacts
Washington County	**Vulnerabilities:** Direct dam-failure exposure for Washington County should be based on current Utah dam-inventory data, applicable emergency action plans, and mapped inundation areas. County location, downstream drainage, or proximity to a reservoir does not by itself establish exposure. Hazard-

Plan Participant	Vulnerabilities and Impacts
	potential classification describes potential consequences of failure or misoperation; it does not describe structural condition or probability of failure. **Impacts:** Where a documented inundation area intersects developed assets, a dam incident could cause rapid flooding, erosion, debris, road and utility damage, evacuation, access disruption, and economic loss. Consequences depend on the affected dam, failure mode, warning time, reservoir conditions, downstream development, and exposed assets. A dam failure could cause life safety threats, wash out roads and crossings, damage utilities and public infrastructure, isolate rural communities, disrupt emergency response and evacuation, and damage agricultural land and other economic assets. Countywide impacts may also include debris deposition, erosion, interruption of regional transportation and service delivery, and recovery costs associated with infrastructure repair and post-disaster coordination. The 2012 Santa Clara/Laub Detention Dam failure demonstrates the potential for destructive downstream flooding in the county.[252] Critical facilities and infrastructure potentially impacted include Washington County Sheriff's Office; Washington County Emergency Management; St. George 911 Communications Center; Southwest Utah Public Health Department; St. George Regional Hospital; Washington County School District facilities; Washington County public works, roads, bridges, culverts, drainage crossings, and emergency access routes; Interstate 15, State Route 9, State Route 7, and other county transportation corridors; Virgin River, Santa Clara River, Ash Creek, La Verkin Creek, and Beaver Dam Wash corridor infrastructure; Washington County Water Conservancy District reservoirs, dams, pipelines, pump stations, water storage, and distribution infrastructure; municipal water and wastewater systems; power, communications, and utility corridors; public buildings, parks, recreation facilities, and visitor-serving facilities in downstream dam inundation areas.
St. George	**Vulnerabilities:** Direct dam-failure exposure for St. George should be based on current Utah dam-inventory data, applicable emergency action plans, and mapped inundation areas. County location, downstream drainage, or proximity to a reservoir does not by itself establish exposure. Hazard-potential classification describes potential consequences of failure or misoperation; it does not describe structural condition or probability of failure. **Impacts:** Where a documented inundation area intersects developed assets, a dam incident could cause rapid flooding, erosion, debris, road and utility damage, evacuation, access disruption, and economic loss. Consequences depend on the affected dam, failure mode, warning time, reservoir conditions, downstream development, and exposed assets. A dam failure could threaten

[252] Utah Division of Emergency Management, Disaster Closeout: Laub Dam Failure, June 29, 2018, indexed by the Association of State Dam Safety Officials. https://damsafety.org/reference/disaster-closeout-laub-dam-failure. Utah Division of Water Resources, Dam Safety. https://water.utah.gov/dam-safety/. Hazard classification describes consequences, not structural condition; current EAPs and inundation mapping are needed to confirm asset exposure.

Plan Participant	Vulnerabilities and Impacts
	life safety, damage homes, businesses, roads, bridges, utilities, and public facilities, disrupt emergency response and hospital access, and interrupt commerce and regional services centered in St. George. High-velocity flooding could also cause channel erosion, debris impacts, utility outages, and costly recovery needs for damaged infrastructure and developed property. Critical facilities and infrastructure potentially impacted include St. George City Hall and municipal government facilities; St. George Police Department; St. George Fire Department stations; St. George 911 Communications Center; St. George Regional Hospital; schools and public facilities in the Washington County School District; St. George public works, water, wastewater, stormwater, and drainage facilities; bridges, culverts, and local road crossings along the Virgin River and Santa Clara River corridors; Interstate 15, State Route 7, Bluff Street, River Road, and other key access routes; utility substations, overhead and underground power, communications infrastructure, parks, trail systems, and recreation facilities that may be affected by dam inundation or related flooding.
Washington City	**Vulnerabilities:** Direct dam-failure exposure for Washington City should be based on current Utah dam-inventory data, applicable emergency action plans, and mapped inundation areas. County location, downstream drainage, or proximity to a reservoir does not by itself establish exposure. Hazard-potential classification describes potential consequences of failure or misoperation; it does not describe structural condition or probability of failure. **Impacts:** Where a documented inundation area intersects developed assets, a dam incident could cause rapid flooding, erosion, debris, road and utility damage, evacuation, access disruption, and economic loss. Consequences depend on the affected dam, failure mode, warning time, reservoir conditions, downstream development, and exposed assets. Dam failure impacts could include injuries or loss of life, structural damage to homes and community facilities, road and bridge closures, disruption to utilities and stormwater systems, and erosion or debris damage to developed areas. Local government operations, schools, and daily travel could also be disrupted while damaged infrastructure is repaired. Critical facilities and infrastructure potentially impacted include Washington City offices and public works facilities; Washington City Police Department; Washington City Fire Department facilities; schools and community facilities; culinary water, irrigation, wastewater, stormwater, drainage, and flood-control infrastructure; bridges, culverts, and road crossings along the Virgin River and local drainage corridors; Interstate 15, State Route 9, Telegraph Street, and major local access routes; Washington County Water Conservancy District facilities serving the Washington area; power, communications, and utility infrastructure; parks, trails, and recreation facilities potentially located in or near dam inundation and flood-prone areas.
Hurricane	**Vulnerabilities:** Direct dam-failure exposure for Hurricane should be based on current Utah dam-inventory data, applicable emergency action plans, and

Plan Participant	Vulnerabilities and Impacts
	mapped inundation areas. County location, downstream drainage, or proximity to a reservoir does not by itself establish exposure. Hazard-potential classification describes potential consequences of failure or misoperation; it does not describe structural condition or probability of failure. **Impacts:** Where a documented inundation area intersects developed assets, a dam incident could cause rapid flooding, erosion, debris, road and utility damage, evacuation, access disruption, and economic loss. Consequences depend on the affected dam, failure mode, warning time, reservoir conditions, downstream development, and exposed assets. Potential impacts include life safety threats, property and infrastructure damage, washed out roads and crossings, utility disruptions, sediment and debris deposition, and interruption of emergency access and evacuation routes. Commercial activity, schools, and public services could also be disrupted if floodwaters damage developed areas or critical facilities. Critical facilities and infrastructure potentially impacted include Hurricane City Hall and public works facilities; Hurricane Police Department; Hurricane Valley Fire District facilities; schools and community facilities; Hurricane municipal water, wastewater, stormwater, and drainage infrastructure; Ash Creek and Virgin River corridor crossings; State Route 9, State Route 7, Interstate 15 access routes, bridges, culverts, and evacuation corridors; Sand Hollow Reservoir and related recreation, dam, spillway, access, and utility infrastructure; Quail Creek Reservoir-related downstream access and utility infrastructure; power, communications, and utility corridors serving Hurricane Valley.
Santa Clara	**Vulnerabilities:** Direct dam-failure exposure for Santa Clara should be based on current Utah dam-inventory data, applicable emergency action plans, and mapped inundation areas. County location, downstream drainage, or proximity to a reservoir does not by itself establish exposure. Hazard-potential classification describes potential consequences of failure or misoperation; it does not describe structural condition or probability of failure. **Impacts:** Where a documented inundation area intersects developed assets, a dam incident could cause rapid flooding, erosion, debris, road and utility damage, evacuation, access disruption, and economic loss. Consequences depend on the affected dam, failure mode, warning time, reservoir conditions, downstream development, and exposed assets. Dam failure could cause severe flooding, structural damage, erosion, and debris impacts to developed areas, with possible injuries, evacuations, utility outages, transportation disruption, and costly repairs. As shown by the 2012 event, damage could extend to homes, businesses, and community infrastructure and require substantial recovery and emergency response resources. Critical facilities and infrastructure potentially impacted include Santa Clara City Hall and municipal facilities; Santa Clara-Ivins Police Department facilities; Santa Clara fire and emergency response facilities; schools and community facilities; municipal water, irrigation, wastewater, stormwater, and drainage systems; Santa Clara

Plan Participant	Vulnerabilities and Impacts
	River corridor bridges, culverts, and local road crossings; Old Highway 91, Santa Clara Drive, and other primary access routes; power, communications, and utility infrastructure; parks, trails, recreation areas, and public facilities near the Santa Clara River or downstream dam inundation areas.
Ivins	**Vulnerabilities:** Direct dam-failure exposure for Ivins should be based on current Utah dam-inventory data, applicable emergency action plans, and mapped inundation areas. County location, downstream drainage, or proximity to a reservoir does not by itself establish exposure. Hazard-potential classification describes potential consequences of failure or misoperation; it does not describe structural condition or probability of failure. **Impacts:** Where a documented inundation area intersects developed assets, a dam incident could cause rapid flooding, erosion, debris, road and utility damage, evacuation, access disruption, and economic loss. Consequences depend on the affected dam, failure mode, warning time, reservoir conditions, downstream development, and exposed assets. Potential impacts include damage to homes, roads, culverts, drainage systems, and utilities; temporary isolation of neighborhoods; and disruption of emergency response, travel, and public services. High-velocity floodwaters may also produce erosion, sediment deposition, and long-term infrastructure repair needs. Critical facilities and infrastructure potentially impacted include Ivins City Hall and municipal facilities; Santa Clara-Ivins Police Department facilities serving Ivins; Ivins fire and emergency response facilities; schools and community facilities; municipal water, wastewater, stormwater, drainage, and irrigation infrastructure; local road crossings, culverts, and drainage channels connected to the Santa Clara River watershed; Old Highway 91 and other primary access routes; power, communications, and utility infrastructure; parks, trails, recreation facilities, and public buildings potentially affected by dam-related flooding or disrupted access.
La Verkin	**Vulnerabilities:** Direct dam-failure exposure for La Verkin should be based on current Utah dam-inventory data, applicable emergency action plans, and mapped inundation areas. County location, downstream drainage, or proximity to a reservoir does not by itself establish exposure. Hazard-potential classification describes potential consequences of failure or misoperation; it does not describe structural condition or probability of failure. **Impacts:** Where a documented inundation area intersects developed assets, a dam incident could cause rapid flooding, erosion, debris, road and utility damage, evacuation, access disruption, and economic loss. Consequences depend on the affected dam, failure mode, warning time, reservoir conditions, downstream development, and exposed assets. Dam failure impacts could include danger to residents and visitors, washed out roads and crossings, damage to homes and utilities, erosion along riverbanks and channels, and interruption of access to nearby communities. Public works capacity and recovery costs could be strained if floodwaters damage transportation or

Plan Participant	Vulnerabilities and Impacts
	utility infrastructure. Critical facilities and infrastructure potentially impacted include La Verkin City offices and public works facilities; La Verkin Police Department; La Verkin fire and emergency response facilities; schools and community facilities; culinary water, wastewater, stormwater, and drainage infrastructure; La Verkin Creek and Virgin River corridor bridges, culverts, and road crossings; State Route 9 and other Zion gateway access routes; power, communications, and utility infrastructure; parks, trails, and public facilities that could be affected by dam inundation, debris, erosion, or access disruption.
Enterprise	**Vulnerabilities:** Direct dam-failure exposure for Enterprise should be based on current Utah dam-inventory data, applicable emergency action plans, and mapped inundation areas. County location, downstream drainage, or proximity to a reservoir does not by itself establish exposure. Hazard-potential classification describes potential consequences of failure or misoperation; it does not describe structural condition or probability of failure. **Impacts:** Where a documented inundation area intersects developed assets, a dam incident could cause rapid flooding, erosion, debris, road and utility damage, evacuation, access disruption, and economic loss. Consequences depend on the affected dam, failure mode, warning time, reservoir conditions, downstream development, and exposed assets. Potential impacts include flooding of homes and agricultural areas, road washouts, damage to culverts, water and utility infrastructure, erosion, and disruption of emergency response and school or business access. Recovery may be prolonged where local staffing and financial capacity are limited and infrastructure repair requires outside assistance. Critical facilities and infrastructure potentially impacted include Enterprise City offices and public works facilities; Enterprise Police Department; Enterprise fire and emergency response facilities; schools and community facilities; municipal water, wastewater, drainage, and stormwater infrastructure; reservoirs, irrigation systems, storage ponds, canals, and agricultural water infrastructure serving the Enterprise area; State Route 18, local bridges, culverts, and rural access roads; power, communications, and utility infrastructure; parks, public buildings, and equipment yards that could be affected by dam-related flooding, washout, or service disruption.
Toquerville	**Vulnerabilities:** Direct dam-failure exposure for Toquerville should be based on current Utah dam-inventory data, applicable emergency action plans, and mapped inundation areas. County location, downstream drainage, or proximity to a reservoir does not by itself establish exposure. Hazard-potential classification describes potential consequences of failure or misoperation; it does not describe structural condition or probability of failure. **Impacts:** Where a documented inundation area intersects developed assets, a dam incident could cause rapid flooding, erosion, debris, road and utility damage, evacuation, access disruption, and economic loss. Consequences depend on the affected dam, failure mode, warning time, reservoir conditions,

Plan Participant	Vulnerabilities and Impacts
	downstream development, and exposed assets. Dam failure could cause injuries, property damage, road and bridge closures, utility disruption, and erosion affecting drainageways and developed areas. The town could also face isolation of neighborhoods, interruption of emergency response, and costly repairs to transportation and stormwater infrastructure. Critical facilities and infrastructure potentially impacted include Toquerville Town Hall and municipal facilities; Toquerville fire and emergency response facilities; public works and utility facilities; schools and community facilities serving the area; culinary water, irrigation, wastewater, stormwater, and drainage infrastructure; Ash Creek and La Verkin Creek watershed crossings; State Route 17, Interstate 15 access routes, bridges, culverts, and local evacuation routes; power, communications, and utility infrastructure; parks, trails, and public facilities that may be exposed to dam-related inundation or disrupted access.
Leeds	**Vulnerabilities:** Direct dam-failure exposure for Leeds should be based on current Utah dam-inventory data, applicable emergency action plans, and mapped inundation areas. County location, downstream drainage, or proximity to a reservoir does not by itself establish exposure. Hazard-potential classification describes potential consequences of failure or misoperation; it does not describe structural condition or probability of failure. **Impacts:** Where a documented inundation area intersects developed assets, a dam incident could cause rapid flooding, erosion, debris, road and utility damage, evacuation, access disruption, and economic loss. Consequences depend on the affected dam, failure mode, warning time, reservoir conditions, downstream development, and exposed assets. Potential impacts include flood damage to residences and infrastructure, erosion and debris impacts in channels, temporary closure of roads or interstate access, utility outages, and disruption of emergency response and commuter travel. Damage to transportation links could create broader regional consequences because of the town's connection to major travel corridors. Critical facilities and infrastructure potentially impacted include Leeds Town Hall and public works facilities; Leeds fire and emergency response facilities; local water, wastewater, drainage, and stormwater infrastructure; bridges, culverts, and road crossings along Leeds Creek, Quail Creek, and nearby drainage corridors; Interstate 15, Main Street, and local access routes; power, communications, and utility infrastructure; parks, public buildings, and community facilities that could be affected by dam inundation, flash flooding, washout, or emergency access disruption.
Virgin	**Vulnerabilities:** Direct dam-failure exposure for Virgin should be based on current Utah dam-inventory data, applicable emergency action plans, and mapped inundation areas. County location, downstream drainage, or proximity to a reservoir does not by itself establish exposure. Hazard-potential classification describes potential consequences of failure or misoperation; it does not describe structural condition or probability of failure.

Plan Participant	Vulnerabilities and Impacts
	Impacts: Where a documented inundation area intersects developed assets, a dam incident could cause rapid flooding, erosion, debris, road and utility damage, evacuation, access disruption, and economic loss. Consequences depend on the affected dam, failure mode, warning time, reservoir conditions, downstream development, and exposed assets. Dam failure could threaten life safety, damage tourism-related businesses, residences, roads, bridges, and utilities, and disrupt SR-9 access, evacuation, and emergency response. Economic impacts could extend beyond physical damage through lost visitor activity, interruptions to local commerce, and prolonged repair of transportation and infrastructure systems. Critical facilities and infrastructure potentially impacted include Virgin Town Hall and municipal facilities; Virgin fire and emergency response facilities; public works, water, wastewater, drainage, and utility infrastructure; Virgin River corridor bridges, culverts, and low-water crossings; State Route 9 and local Zion gateway access routes; power, communications, and utility corridors; parks, trailheads, recreation access points, campgrounds, and public facilities that could be affected by dam-related flooding, erosion, debris, or access interruption.
Springdale	**Vulnerabilities:** Direct dam-failure exposure for Springdale should be based on current Utah dam-inventory data, applicable emergency action plans, and mapped inundation areas. County location, downstream drainage, or proximity to a reservoir does not by itself establish exposure. Hazard-potential classification describes potential consequences of failure or misoperation; it does not describe structural condition or probability of failure. **Impacts:** Where a documented inundation area intersects developed assets, a dam incident could cause rapid flooding, erosion, debris, road and utility damage, evacuation, access disruption, and economic loss. Consequences depend on the affected dam, failure mode, warning time, reservoir conditions, downstream development, and exposed assets. Potential impacts include life safety threats, damage to hotels, businesses, homes, roads, bridges, utilities, and public facilities, and severe disruption to tourism, evacuation, and emergency access in the Zion gateway area. Because transportation options are limited, even moderate infrastructure damage could cause major economic losses and prolonged service interruptions. Critical facilities and infrastructure potentially impacted include Springdale Town Hall and municipal facilities; Springdale Police Department and emergency response facilities; public works, water, wastewater, drainage, and stormwater infrastructure; Virgin River corridor bridges, culverts, and low-water crossings; State Route 9, Zion Canyon access routes, shuttle-related facilities, and visitor-serving transportation infrastructure; power, communications, and utility infrastructure; parks, trails, lodging areas, visitor facilities, and Zion gateway recreation assets potentially exposed to dam-related flooding, erosion, debris, or access disruption.
New Harmony	**Vulnerabilities:** Direct dam-failure exposure for New Harmony should be based on current Utah dam-inventory data, applicable emergency action

Plan Participant	Vulnerabilities and Impacts
	plans, and mapped inundation areas. County location, downstream drainage, or proximity to a reservoir does not by itself establish exposure. Hazard-potential classification describes potential consequences of failure or misoperation; it does not describe structural condition or probability of failure. **Impacts:** Where a documented inundation area intersects developed assets, a dam incident could cause rapid flooding, erosion, debris, road and utility damage, evacuation, access disruption, and economic loss. Consequences depend on the affected dam, failure mode, warning time, reservoir conditions, downstream development, and exposed assets. Dam failure impacts could include flooding of homes and roads, erosion of drainage channels, damage to water and utility systems, interruption of emergency response and school or commuter access, and economic losses tied to infrastructure repair. Recovery may be slower where local staffing and resources are limited. Critical facilities and infrastructure potentially impacted include New Harmony Town Hall and municipal facilities; fire and emergency response facilities; public works, water, wastewater, drainage, and utility infrastructure; local bridges, culverts, and rural access roads; Interstate 15 and State Route 144 access routes; Ash Creek watershed drainage crossings; power, communications, and utility corridors; parks, community facilities, and public buildings that could be affected by dam-related flooding, washout, debris, or isolation.
Rockville	**Vulnerabilities:** Direct dam-failure exposure for Rockville should be based on current Utah dam-inventory data, applicable emergency action plans, and mapped inundation areas. County location, downstream drainage, or proximity to a reservoir does not by itself establish exposure. Hazard-potential classification describes potential consequences of failure or misoperation; it does not describe structural condition or probability of failure. **Impacts:** Where a documented inundation area intersects developed assets, a dam incident could cause rapid flooding, erosion, debris, road and utility damage, evacuation, access disruption, and economic loss. Consequences depend on the affected dam, failure mode, warning time, reservoir conditions, downstream development, and exposed assets. Potential impacts include life safety threats, structural damage to homes and historic resources, erosion, roadway and bridge damage, utility outages, and disruption of access for residents and visitors. Because the community is small and access is limited, even localized flood damage could significantly affect evacuation, emergency response, and recovery operations. Critical facilities and infrastructure potentially impacted include Rockville Town Hall and municipal facilities; fire and emergency response facilities; public works, water, wastewater, drainage, and utility infrastructure; Virgin River corridor bridges, culverts, and low-water crossings; State Route 9 and local Zion gateway access routes; power, communications, and utility infrastructure; parks, trailheads, recreation access points, and public facilities that may be affected by dam-related flooding, erosion, debris, or access disruption.

Plan Participant	Vulnerabilities and Impacts
Apple Valley	**Vulnerabilities:** Direct dam-failure exposure for Apple Valley should be based on current Utah dam-inventory data, applicable emergency action plans, and mapped inundation areas. County location, downstream drainage, or proximity to a reservoir does not by itself establish exposure. Hazard-potential classification describes potential consequences of failure or misoperation; it does not describe structural condition or probability of failure. **Impacts:** Where a documented inundation area intersects developed assets, a dam incident could cause rapid flooding, erosion, debris, road and utility damage, evacuation, access disruption, and economic loss. Consequences depend on the affected dam, failure mode, warning time, reservoir conditions, downstream development, and exposed assets. Dam failure could damage homes, roads, culverts, and utility systems; cause erosion and debris deposition in channels and drainageways; and interrupt emergency response, school travel, and access to essential services. Recovery could be challenging if multiple dispersed areas are affected at the same time. Critical facilities and infrastructure potentially impacted include Apple Valley Town Hall and municipal facilities; fire and emergency response facilities; public works, water, wastewater, drainage, and utility infrastructure; local bridges, culverts, washes, and rural access roads; State Route 59 and local evacuation routes; power, communications, and utility corridors; parks, community facilities, and public buildings that could be affected by dam-related flooding, washout, debris, or delayed emergency access.
Hildale	**Vulnerabilities:** Direct dam-failure exposure for Hildale should be based on current Utah dam-inventory data, applicable emergency action plans, and mapped inundation areas. County location, downstream drainage, or proximity to a reservoir does not by itself establish exposure. Hazard-potential classification describes potential consequences of failure or misoperation; it does not describe structural condition or probability of failure. **Impacts:** Where a documented inundation area intersects developed assets, a dam incident could cause rapid flooding, erosion, debris, road and utility damage, evacuation, access disruption, and economic loss. Consequences depend on the affected dam, failure mode, warning time, reservoir conditions, downstream development, and exposed assets. Potential impacts include danger to residents, damage to homes and infrastructure, washed out roads or crossings, utility and water service interruption, erosion, and disruption of emergency response and public safety operations. In a community with significant infrastructure needs, repair and recovery could require outside technical and financial assistance. Critical facilities and infrastructure potentially impacted include Hildale City Hall and municipal facilities; Hildale Police Department; Hildale fire and emergency response facilities; Water Canyon School and other community facilities; public works, culinary water, wastewater, stormwater, drainage, and utility infrastructure; local bridges, culverts, washes, and drainage crossings; Utah State Route 59 and community

Plan Participant	Vulnerabilities and Impacts
	access routes; power, communications, and utility corridors; parks, public buildings, and facilities that could be affected by dam-related flooding, debris flows, washout, or isolation.

Damaging Winds

Table 162 summarizes damaging wind vulnerabilities and potential impacts for Washington County participants.

Table 162: Damaging Winds Vulnerability and Impact Assessment for Washington County

Plan Participant	Vulnerabilities and Impacts
Washington County	**Vulnerabilities:** Washington County is highly vulnerable to damaging winds because it contains the largest population and most extensive transportation, utility, public facility, agricultural, and recreation assets in the five-county region. Vulnerable assets include unincorporated neighborhoods, roads and bridges, overhead utilities, public safety facilities, schools, parks, agricultural lands, and county-supported infrastructure located in exposed valleys, desert basins, canyon mouths, and travel corridors where strong winds, downbursts, and blowing dust can occur. **Impacts:** Damaging winds can down trees and power lines, damage roofs and outbuildings, disrupt utilities and communications, create hazardous travel conditions on regional roads, and interrupt emergency response and service delivery. Countywide impacts may also include debris removal costs, short-term business and agricultural losses due to Rocky Mountain Power shutoffs during high wind events, reduced access to recreation areas, and increased wildfire potential during hot, dry conditions. Critical facilities and infrastructure potentially impacted include Washington County Sheriff's Office; Washington County Emergency Management; St. George 911 Communications Center; Southwest Utah Public Health Department; St. George Regional Hospital; Washington County School District facilities; county and municipal government buildings; public safety facilities; public works facilities; Interstate 15, State Route 9, State Route 7, State Route 18, and other regional roadways, bridges, culverts, traffic signals, and evacuation routes; St. George Regional Airport; overhead electric distribution lines, substations, communications towers, cellular and internet infrastructure, water and wastewater systems, storm drainage systems, fuel supply points, traffic-control systems, parks, trailheads, campgrounds, reservoir recreation facilities, tourism and visitor-serving infrastructure, agricultural buildings, sheds, fences, corrals, irrigation equipment, and maintenance yards vulnerable to high winds, debris, downed trees, blowing dust, crosswinds, outages, and access disruption.

Plan Participant	Vulnerabilities and Impacts
St. George	**Vulnerabilities:** St. George is highly vulnerable because of its dense residential and commercial development, schools, medical facilities, major arterials, airport-related infrastructure, utilities, parks, and recreation assets located in exposed valley and gap-wind settings. Older or lightweight structures, signs, trees, overhead power lines, and heavily traveled roads are especially susceptible to strong winds and downbursts. **Impacts:** Damaging winds can cause roof and window damage, power outages, fallen trees, roadway obstructions, and disruption to businesses, schools, health care access, and public services. Strong winds may also create hazardous driving conditions, damage recreation facilities, and increase emergency response demands and cleanup costs in this regional service center. Critical facilities and infrastructure potentially impacted include St. George City Hall and municipal government facilities; St. George Police Department; St. George Fire Department stations; St. George 911 Communications Center; St. George Regional Hospital; Utah Tech University facilities; Washington County School District schools and support facilities; St. George Regional Airport; public works, water, wastewater, stormwater, and drainage facilities; Interstate 15, State Route 7, Bluff Street, River Road, St. George Boulevard, traffic signals, bridges, culverts, and major arterials; overhead power lines, substations, communications equipment, signs, parks, sports fields, trail systems, recreation facilities, commercial centers, medical offices, hotels, warehouses, and older or lightweight structures vulnerable to roof damage, broken windows, sign failure, debris, power outages, and travel disruption.
Washington City	**Vulnerabilities:** Washington City is vulnerable where growing neighborhoods, schools, commercial areas, arterial roads, utilities, parks, and public facilities are exposed to damaging winds across open urban and suburban terrain. Continued growth increases the number of homes, construction sites, signs, and overhead systems that can be affected by strong winds, debris, and short-duration power outages. **Impacts:** Damaging winds can damage roofs, fences, trees, signs, and utility infrastructure; interrupt power and communications; and create unsafe travel conditions on local roads. City operations, schools, construction activity, and routine travel may also be disrupted while debris is cleared and damaged infrastructure is repaired. Critical facilities and infrastructure potentially impacted include Washington City offices and municipal facilities; Washington City Police Department; Washington City Fire Department facilities; Washington County School District schools and community facilities; public works facilities; culinary water, irrigation, wastewater, stormwater, drainage, and flood-control infrastructure; Interstate 15, State Route 9, Telegraph Street, Green Spring Drive, traffic signals, local bridges, culverts, and major access routes; overhead power and communications infrastructure; utility equipment, parks, sports fields, trail systems, commercial centers, signs, and public facilities vulnerable to wind-driven debris, downed lines, roof and siding damage, blowing dust, crosswinds, outages, and interrupted access.

Plan Participant	Vulnerabilities and Impacts
Hurricane	**Vulnerabilities:** Hurricane is vulnerable because homes, schools, businesses, roads, utilities, and public facilities are exposed in the Hurricane Valley and along travel corridors where strong winds, thunderstorm outflows, and blowing dust can occur. Growing development, exposed terrain, recreation traffic, and overhead infrastructure increase the city's sensitivity to wind-related damage and service disruption. **Impacts:** Potential impacts include roof and fence damage, fallen trees and debris, power outages, hazardous travel conditions, disruption to schools, businesses, and emergency access. Damaging winds may also affect recreation-oriented travel and increase wildfire risk when strong winds coincide with dry vegetation and hot weather. Critical facilities and infrastructure potentially impacted include Hurricane City Hall and municipal facilities; Hurricane Police Department; Hurricane Valley Fire District facilities; Washington County School District schools and community facilities; public works, water, wastewater, stormwater, drainage, and irrigation infrastructure; Interstate 15 access routes, State Route 9, State Route 7, State Route 59, major local roads, traffic signals, bridges, culverts, and evacuation routes; overhead power and communications infrastructure; Sand Hollow Reservoir and Quail Creek Reservoir recreation-support facilities; parks, trailheads, campgrounds, marinas, commercial areas, tourism businesses, signs, utility corridors, and lightweight structures vulnerable to high winds, crosswinds, blowing dust, downed lines, debris, roof damage, and access disruption.
Santa Clara	**Vulnerabilities:** Santa Clara is vulnerable where residential neighborhoods, schools, parks, local roads, utilities, and public buildings are exposed to damaging winds moving through open urban-edge terrain and drainage-influenced corridors. Trees, fences, signage, lightweight structures, and overhead power lines are particularly susceptible to strong gusts and debris impacts. **Impacts:** Damaging winds can cause structural and landscape damage, utility interruptions, road obstructions, and temporary disruption to schools, city functions, and neighborhood access. Winds can also elevate fire danger and increase cleanup and repair costs when they affect trees, poles, signs, and other exposed infrastructure. Critical facilities and infrastructure potentially impacted include Santa Clara City Hall and municipal facilities; Santa Clara-Ivins Police Department facilities; Santa Clara fire and emergency response facilities; Washington County School District schools and community facilities; public works, water, wastewater, stormwater, drainage, and irrigation infrastructure; Old Highway 91, Santa Clara Drive, traffic signals, bridges, culverts, and local access routes; overhead electric and communications infrastructure; parks, trails, recreation facilities, signs, commercial areas, and public buildings vulnerable to wind damage, downed trees or limbs, debris, power interruptions, roof and siding damage, and temporary road closures.
Ivins	**Vulnerabilities:** Ivins is vulnerable where neighborhoods, roads, public facilities, utility systems, tourism-related amenities, and trail or recreation access areas are exposed to strong winds across open desert terrain and near

Plan Participant	Vulnerabilities and Impacts
	slope and canyon transitions. The city's growth and reliance on limited transportation and utility connections increase sensitivity to debris, falling trees, and wind damage. **Impacts:** Potential impacts include roof and fence damage, downed trees and utility lines, temporary loss of power or communications, and travel disruption on local roads. Public events, recreation use, and day-to-day services may also be interrupted while debris is removed and damaged infrastructure is restored. Critical facilities and infrastructure potentially impacted include Ivins City Hall and municipal facilities; Santa Clara-Ivins Police Department facilities serving Ivins; Ivins fire and emergency response facilities; Washington County School District schools and community facilities; public works, water, wastewater, stormwater, drainage, and irrigation infrastructure; Old Highway 91, Center Street, local access routes, bridges, culverts, and traffic-control devices; overhead power and communications infrastructure; parks, trailheads, recreation facilities, signs, public buildings, utility equipment, and lightweight structures vulnerable to high winds, debris impacts, outages, downed lines, roof damage, and disrupted access.
La Verkin	**Vulnerabilities:** La Verkin is vulnerable because homes, roads, utilities, bridges, schools, and public facilities are exposed in a valley-and-river corridor setting where strong winds and outflow events can move debris and affect access. The community's transportation connections and overhead infrastructure are susceptible to fallen trees, damaged poles, and reduced travel safety during wind events. **Impacts:** Damaging winds can cause property damage, road blockages, utility outages, and disruption to emergency response, schools, and daily travel. Winds may also create dangerous conditions for vehicles, increase cleanup costs, and contribute to wildfire spread potential during dry conditions. Critical facilities and infrastructure potentially impacted include La Verkin City offices and municipal facilities; La Verkin Police Department; La Verkin fire and emergency response facilities; Washington County School District schools and community facilities; public works, water, wastewater, stormwater, drainage, and utility infrastructure; State Route 9, State Route 17, local bridges, culverts, traffic-control devices, and Zion gateway access routes; overhead electric and communications infrastructure; parks, trailheads, visitor-serving businesses, signs, public buildings, and utility corridors vulnerable to wind-driven debris, crosswinds, downed lines, power outages, roof damage, and access disruption.
Enterprise	**Vulnerabilities:** Enterprise is vulnerable where homes, agricultural buildings, corrals, fences, roads, schools, utilities, and local businesses are exposed across open rural terrain with limited windbreaks. The community's agricultural assets, overhead infrastructure, and reliance on a smaller number of transportation routes increase sensitivity to high winds, debris, and service interruption.

Plan Participant	Vulnerabilities and Impacts
	Impacts: Potential impacts include roof and outbuilding damage, damage to fences and agricultural equipment, power outages, road obstructions, and disruption to school, business, and emergency access. Strong winds can also increase wildfire danger and prolong recovery where local staffing and financial resources are limited. Critical facilities and infrastructure potentially impacted include Enterprise City offices and municipal facilities; Enterprise Police Department; Enterprise fire and emergency response facilities; Washington County School District schools and community facilities; public works, water, wastewater, drainage, stormwater, irrigation, and agricultural water infrastructure; State Route 18, local roads, bridges, culverts, traffic-control devices, and rural access routes; overhead power and communications infrastructure; agricultural buildings, barns, sheds, fences, corrals, irrigation equipment, parks, public buildings, signs, and maintenance yards vulnerable to strong winds, blowing dust, downed lines, debris, roof damage, and delayed emergency access.
Toquerville	**Vulnerabilities:** Toquerville is vulnerable because homes, roads, utilities, schools, and expanding residential areas are exposed on open terrain and along transportation corridors where damaging winds can occur. Trees, fences, signs, construction sites, and overhead lines are especially susceptible as growth continues and more assets are placed in wind-exposed settings. **Impacts:** Damaging winds can cause structural damage, fallen trees and debris, power interruptions, and unsafe travel conditions on local roads. The town may also experience disruption to public services, school access, and routine travel, along with added fire danger and cleanup costs during dry and windy periods. Critical facilities and infrastructure potentially impacted include Toquerville Town Hall and municipal facilities; Toquerville fire and emergency response facilities; public works and utility facilities; Washington County School District schools and community facilities serving the area; culinary water, irrigation, wastewater, stormwater, and drainage infrastructure; State Route 17, Interstate 15 access routes, local roads, bridges, culverts, traffic-control devices, and evacuation routes; overhead electric and communications infrastructure; parks, trails, public buildings, signs, and visitor-serving facilities vulnerable to wind damage, debris, downed lines, outages, blowing dust, and interrupted access.
Leeds	**Vulnerabilities:** Leeds is vulnerable where homes, Interstate 15 access, local roads, utility systems, and community facilities are exposed to strong winds in an area influenced by steep terrain, open gaps, and major travel corridors. Transportation links, overhead utilities, trees, signs, and lightweight structures are especially susceptible to crosswinds, debris, and visibility reduction.

Plan Participant	Vulnerabilities and Impacts
	Impacts: Potential impacts include roof and fence damage, downed trees or power lines, temporary closures or hazardous conditions on local roads and interstate connections, and interruption of utility service and emergency access. Because of the town's connection to major travel routes, wind events can also create wider regional transportation and safety consequences. Critical facilities and infrastructure potentially impacted include Leeds Town Hall and public works facilities; Leeds fire and emergency response facilities; water, wastewater, stormwater, drainage, and utility infrastructure; Interstate 15, Main Street, local roads, bridges, culverts, traffic-control devices, and access routes; overhead electric and communications infrastructure; parks, public buildings, signs, utility corridors, and community facilities vulnerable to high winds, crosswinds, downed lines, debris, power interruptions, roof damage, and access disruption.
Virgin	**Vulnerabilities:** Virgin is vulnerable because homes, businesses, SR-9, utility systems, lodging, and visitor-serving facilities are exposed in the Zion gateway corridor where canyon and valley winds can affect residents and visitors. Limited access routes, tourism activity, and overhead infrastructure increase the town's sensitivity to high winds, debris, and travel disruption. **Impacts:** Damaging winds can threaten life safety, damage businesses and residences, interrupt utility service, and create hazardous travel conditions for residents and park visitors. Economic impacts may also include disruption to tourism, temporary closure of outdoor activities, and recovery costs tied to debris removal and infrastructure repair. Critical facilities and infrastructure potentially impacted include Virgin Town Hall and municipal facilities; Virgin fire and emergency response facilities; public works, water, wastewater, drainage, and utility infrastructure; State Route 9, local roads, bridges, culverts, traffic-control devices, and Zion gateway access routes; overhead electric and communications infrastructure; parks, trailheads, campgrounds, visitor-serving facilities, signs, public buildings, and utility corridors vulnerable to wind-driven debris, downed lines, power outages, crosswinds, roof damage, and interrupted access.
Springdale	**Vulnerabilities:** Springdale is highly vulnerable because lodging, businesses, homes, roads, utilities, and visitor facilities are concentrated in a narrow Zion gateway corridor with constrained transportation access and high visitor volumes. Trees, signs, overhead lines, and lightweight or exposed structures are susceptible to damaging winds that can move through canyon and river-adjacent settings. **Impacts:** Potential impacts include damage to buildings and tourism infrastructure, utility outages, roadway obstructions, hazardous conditions for visitors and employees, and interruption of access, evacuation, and local commerce. Even moderate wind damage can create outsized economic and operational impacts because of the town's reliance on tourism and limited transportation redundancy. Critical facilities and infrastructure potentially impacted include Springdale Town Hall and municipal facilities; Springdale Police Department and emergency response facilities; public works, water,

Plan Participant	Vulnerabilities and Impacts
	wastewater, drainage, stormwater, and utility infrastructure; State Route 9, Zion Canyon access routes, shuttle-related transportation facilities, bridges, culverts, traffic-control devices, and local access routes; overhead electric and communications infrastructure; parks, trailheads, lodging areas, restaurants, visitor facilities, signs, public buildings, and recreation assets vulnerable to damaging winds, downed trees or limbs, debris, outages, crosswinds, and access disruption.
New Harmony	**Vulnerabilities:** New Harmony is vulnerable where homes, local roads, water systems, public buildings, and agricultural or open land areas are exposed in a rural mountain-valley setting with limited alternate access and overhead utility infrastructure. Trees, outbuildings, fencing, and road access are especially susceptible to strong winds, falling limbs, and power disruption. **Impacts:** Damaging winds can cause property damage, utility outages, road obstructions, and interruption of emergency response, school travel, and local services. The town may also face prolonged recovery where staffing and resources are limited, particularly if wind damage affects roads, water systems, or wildfire conditions. Critical facilities and infrastructure potentially impacted include New Harmony Town Hall and municipal facilities; fire and emergency response facilities; public works, water, wastewater, drainage, and utility infrastructure; Interstate 15, State Route 144, local roads, bridges, culverts, traffic-control devices, and rural access routes; overhead electric and communications infrastructure; parks, public buildings, signs, agricultural structures, sheds, fences, and utility corridors vulnerable to high winds, blowing dust, downed lines, debris, roof damage, and delayed emergency access.
Rockville	**Vulnerabilities:** Rockville is vulnerable because homes, historic resources, roads, bridges, utilities, and public spaces are concentrated in a small gateway setting with limited access and exposure to canyon and river corridor winds. Trees, signs, fences, and older or lightweight structures are particularly susceptible to wind damage, debris, and service interruption. **Impacts:** Potential impacts include damage to homes and historic assets, blocked roads, power outages, unsafe travel conditions, and disruption of access for residents and visitors. Because the community is small and transportation options are limited, even localized wind damage can significantly affect emergency response, tourism activity, and recovery operations. Critical facilities and infrastructure potentially impacted include Rockville Town Hall and municipal facilities; fire and emergency response facilities; public works, water, wastewater, drainage, and utility infrastructure; State Route 9, local roads, bridges, culverts, traffic-control devices, and Zion gateway access routes; overhead electric and communications infrastructure; parks, trailheads, visitor-serving facilities, signs, public buildings, and utility corridors vulnerable to damaging winds, downed trees or limbs, debris, power outages, crosswinds, roof damage, and interrupted access.

Plan Participant	Vulnerabilities and Impacts
Apple Valley	**Vulnerabilities:** Apple Valley is vulnerable where dispersed residential development, local roads, water and utility systems, and community facilities are exposed across open rural terrain. Fences, outbuildings, trees, overhead lines, and limited-access roads are susceptible to damaging winds, debris, and short-term service disruption. **Impacts:** Damaging winds can damage homes, outbuildings, fences, and utilities; create hazardous travel conditions; and interrupt access to essential services and emergency response. Recovery can be challenging if multiple dispersed neighborhoods are affected at once or if winds contribute to wildfire spread and extended utility outages. Critical facilities and infrastructure potentially impacted include Apple Valley Town Hall and municipal facilities; fire and emergency response facilities; public works, water, wastewater, drainage, and utility infrastructure; State Route 59, local roads, bridges, culverts, washes, traffic-control devices, and rural access routes; overhead electric and communications infrastructure; parks, public buildings, signs, agricultural structures, sheds, fences, and utility corridors vulnerable to high winds, blowing dust, downed lines, debris, roof damage, and delayed emergency access.
Hildale	**Vulnerabilities:** Hildale is vulnerable where homes, schools, roads, utility and water systems, and public facilities are exposed to strong winds in a rugged terrain setting with drainage-sensitive development and limited infrastructure redundancy. The community's buildings, overhead lines, trees, and transportation connections can be affected by damaging gusts, debris, and service disruption. **Impacts:** Potential impacts include roof and school building damage, utility and water service interruption, road obstructions, injuries from debris, and disruption to emergency response and public safety operations. Wind events can also increase recovery demands in a community with ongoing infrastructure needs and may elevate wildfire danger during dry conditions. Critical facilities and infrastructure potentially impacted include Hildale City Hall and municipal facilities; Hildale Police Department; Hildale fire and emergency response facilities; Water Canyon School and other community facilities; public works, culinary water, wastewater, stormwater, drainage, and utility infrastructure; Utah State Route 59, local roads, bridges, culverts, washes, traffic-control devices, and community access routes; overhead electric and communications infrastructure; parks, public buildings, signs, utility corridors, and lightweight structures vulnerable to damaging winds, debris, downed lines, power outages, roof damage, blowing dust, and isolation.

Drought

Table 163 summarizes drought vulnerabilities and potential impacts for Washington County participants.

Table 163: Drought Vulnerability and Impact Assessment for Washington County

Plan Participant	Vulnerabilities and Impacts
Washington County	**Vulnerabilities:** Washington County is highly vulnerable to drought because it is Utah's most arid county, depends on the Virgin River Basin and limited stored and groundwater supplies, and contains a large and growing population, extensive landscaping demand, agricultural lands, parks, recreation areas, and county-supported infrastructure that all rely on reliable water availability. Prolonged drought could affect municipal water systems serving St. George, Washington, Hurricane, Santa Clara, Ivins, Toquerville, La Verkin, and Virgin. These systems are critical for public health, firefighting, and sanitation. Vulnerable assets include municipal and domestic water systems, irrigation delivery systems, public landscapes, agricultural operations, rural communities, and natural areas stressed by prolonged dry conditions.[253] **Impacts:** Drought can reduce water supply reliability, increase pressure on county and local conservation measures, stress agriculture and livestock operations, degrade vegetation and watershed conditions, and increase wildfire and dust potential. Countywide impacts may also include higher operating costs for water management, reduced landscape health, pressure on recreation resources, and service challenges for rural communities and public facilities dependent on limited water supplies. Critical facilities and infrastructure potentially impacted include Washington County Water Conservancy District reservoirs, wells, pipelines, pump stations, water storage tanks, treatment and distribution infrastructure; municipal and domestic water systems serving St. George, Washington City, Hurricane, Santa Clara, Ivins, Toquerville, La Verkin, Virgin, and other county communities; irrigation systems, canals, agricultural water delivery infrastructure, livestock water supplies, parks, public landscapes, recreation areas, campgrounds, trailheads, public buildings, schools, health care facilities, fire protection water supplies, wastewater systems, utility corridors, and rural community water systems vulnerable to reduced water availability, conservation restrictions, vegetation stress, increased wildfire risk, dust, and higher operating costs.

[253] Washington County Water Conservancy District, 2025 Water Shortage Contingency Plan, Executive Summary and Chapter 2. https://wcwcd.gov/wp-content/uploads/2025/11/2025WaterShortageContingencyPlan.pdf. Source for water-shortage vulnerability and the eight municipal partners; it describes the county as one of the hottest and driest regions rather than establishing a statewide aridity ranking.

Plan Participant	Vulnerabilities and Impacts
St. George	**Vulnerabilities:** St. George is highly vulnerable because of its large and growing population, heavy municipal and landscape irrigation demand, reliance on regional water supplies, parks and recreation amenities, commercial development, and public facilities that require dependable water service. The city's urban setting, summer evapotranspiration, and continued growth increase sensitivity to prolonged drought and conservation needs. **Impacts:** Drought can strain municipal water supply and demand management, increase conservation requirements, stress landscaped public spaces and private properties, and raise costs associated with water delivery, cooling, and vegetation maintenance. Reduced water availability can also affect quality of life, urban tree cover, recreation amenities, and wildfire risk at the urban edge. Critical facilities and infrastructure potentially impacted include St. George municipal water supply, treatment, storage, pumping, and distribution systems; Washington County Water Conservancy District facilities serving the St. George area; St. George public works facilities; St. George Regional Hospital; St. George 911 Communications Center; St. George City Hall and municipal facilities; Washington County School District schools; Utah Tech University facilities; parks, golf courses, sports fields, public landscapes, street trees, recreation facilities, trail systems, fire protection water supplies, wastewater systems, commercial centers, hotels, medical offices, and visitor-serving infrastructure vulnerable to water restrictions, increased irrigation demand, reduced landscape health, higher operating costs, and elevated wildfire risk at the urban edge.
Washington City	**Vulnerabilities:** Washington City is vulnerable where growing neighborhoods, schools, parks, commercial areas, and utility systems depend on reliable municipal water supply and landscaping irrigation. Continued residential growth increases water demand and places additional pressure on limited regional supplies during prolonged dry periods. **Impacts:** Drought can require stricter conservation measures, reduce irrigation reliability, stress landscaped areas and community vegetation, and increase costs for water management and public facility operations. Prolonged drought may also elevate wildfire risk, affect outdoor amenities, and place pressure on long-term infrastructure planning for growth. Critical facilities and infrastructure potentially impacted include Washington City municipal water supply, storage, pumping, irrigation, wastewater, and distribution systems; Washington City offices and public works facilities; Washington City Police Department; Washington City Fire Department facilities; schools and community facilities; parks, sports fields, public landscapes, trail systems, commercial centers, residential irrigation systems, fire protection water supplies, stormwater and drainage infrastructure, utility corridors, and Washington County Water Conservancy District facilities serving the Washington area vulnerable to reduced water availability, conservation requirements, vegetation stress, higher maintenance costs, and increased wildfire potential.

Plan Participant	Vulnerabilities and Impacts
Hurricane	**Vulnerabilities:** Hurricane is vulnerable because homes, schools, businesses, parks, utility systems, and some agricultural and open-space lands depend on reliable water supply in a fast-growing area with strong seasonal demand. Landscape irrigation, recreation-related uses, and development expansion increase sensitivity to prolonged dry conditions and reduced water availability. **Impacts:** Drought can reduce water supply flexibility, increase conservation requirements, stress vegetation and community landscapes, and raise operating costs for water delivery, irrigation, and facility maintenance. It can also affect agricultural production, heighten wildfire potential, and create longer-term planning challenges as population growth continues. Critical facilities and infrastructure potentially impacted include Hurricane municipal water, irrigation, wastewater, storage, pumping, and distribution infrastructure; Hurricane City Hall and public works facilities; Hurricane Police Department; Hurricane Valley Fire District facilities; schools and community facilities; Sand Hollow Reservoir and Quail Creek Reservoir recreation-support facilities; parks, trailheads, campgrounds, marinas, public landscapes, agricultural and open-space irrigation systems, fire protection water supplies, commercial areas, tourism businesses, utility corridors, and recreation amenities vulnerable to reduced water supply flexibility, conservation restrictions, stressed vegetation, increased wildfire risk, and higher operating and maintenance costs.
Santa Clara	**Vulnerabilities:** Santa Clara is vulnerable where residential areas, parks, schools, community facilities, and landscaped public and private properties rely on dependable municipal water supply and irrigation. Its location within the arid St. George urban area means prolonged drought can quickly affect outdoor water use, vegetation health, and local conservation needs. **Impacts:** Drought can reduce irrigation availability, stress urban vegetation and public landscapes, increase pressure for conservation, and raise costs for maintaining community amenities and water infrastructure. It can also contribute to wildfire risk at the community edge and reduce resilience of trees and open-space resources during extended dry periods. Critical facilities and infrastructure potentially impacted include Santa Clara municipal water, irrigation, wastewater, storage, pumping, and distribution systems; Santa Clara City Hall and municipal facilities; Santa Clara-Ivins Police Department facilities; Santa Clara fire and emergency response facilities; schools and community facilities; parks, trails, public landscapes, community open spaces, street trees, residential irrigation systems, fire protection water supplies, utility corridors, and public buildings vulnerable to reduced irrigation availability, water conservation measures, vegetation decline, higher landscape maintenance costs, and increased wildfire risk near community edges.
Ivins	**Vulnerabilities:** Ivins is vulnerable because homes, parks, public facilities, tourism-related amenities, and desert-edge landscapes depend on reliable municipal water supplies and irrigation in an already arid setting. Continued

Plan Participant	Vulnerabilities and Impacts
	growth and outdoor amenity demands increase sensitivity to prolonged drought and water conservation needs. **Impacts:** Drought can increase pressure on municipal water management, reduce irrigation flexibility, stress landscaping and vegetation, and increase costs for maintaining public spaces and community facilities. It can also heighten wildfire risk near open lands and affect the appearance and usability of parks, trails, and outdoor gathering spaces. Critical facilities and infrastructure potentially impacted include Ivins municipal water, wastewater, irrigation, storage, pumping, and distribution infrastructure; Ivins City Hall and municipal facilities; Santa Clara-Ivins Police Department facilities serving Ivins; Ivins fire and emergency response facilities; schools and community facilities; parks, trailheads, recreation facilities, public landscapes, desert-edge open spaces, residential irrigation systems, fire protection water supplies, utility corridors, and tourism-related amenities vulnerable to reduced water availability, drought-related vegetation stress, conservation restrictions, higher operating costs, and increased wildfire risk near open lands.
La Verkin	**Vulnerabilities:** La Verkin is vulnerable where homes, parks, schools, utility systems, and nearby agricultural or open-space lands rely on dependable water supplies in a dry climate. Local vegetation, public landscapes, and municipal systems can be stressed during prolonged drought, especially where water sources are limited or demand rises during hot months. **Impacts:** Drought can reduce water availability for irrigation and community needs, increase conservation pressure, stress vegetation and local landscapes, and raise costs associated with water management and public facility maintenance. It can also increase wildfire potential and affect nearby agricultural uses and outdoor community assets. Critical facilities and infrastructure potentially impacted include La Verkin municipal water, wastewater, storage, pumping, irrigation, and distribution infrastructure; La Verkin City offices and public works facilities; La Verkin Police Department; La Verkin fire and emergency response facilities; schools and community facilities; parks, trailheads, public landscapes, nearby agricultural and open-space irrigation systems, fire protection water supplies, utility corridors, and Zion gateway visitor-serving facilities vulnerable to reduced water availability, vegetation stress, higher water management costs, conservation requirements, and increased wildfire potential.
Enterprise	**Vulnerabilities:** Enterprise is highly vulnerable because of its rural setting, dependence on local water systems, agricultural lands, livestock operations, irrigated fields, and open-space resources that are sensitive to prolonged dry conditions. Homes, schools, businesses, and farms all depend on limited water supplies, forage conditions, and reliable irrigation in a drought-prone environment.

Plan Participant	Vulnerabilities and Impacts
	Impacts: Drought can reduce irrigation reliability, degrade forage and rangeland productivity, increase feed and operating costs for producers, stress local water supplies, and affect vegetation and community landscapes. It can also heighten wildfire potential, increase dust, and create long-term financial and service challenges in a small rural community with limited redundancy. Critical facilities and infrastructure potentially impacted include Enterprise municipal and domestic water systems, wells, storage tanks, pumping and distribution infrastructure; Enterprise City offices and public works facilities; Enterprise Police Department; Enterprise fire and emergency response facilities; schools and community facilities; irrigation systems, canals, reservoirs, storage ponds, livestock water supplies, agricultural water infrastructure, farms, ranches, corrals, barns, fields, parks, public landscapes, fire protection water supplies, wastewater and drainage infrastructure, utility corridors, and rural access routes vulnerable to reduced irrigation reliability, forage loss, water shortages, dust, increased wildfire potential, and higher operating costs for agricultural and community systems.
Toquerville	**Vulnerabilities:** Toquerville is vulnerable where growing residential areas, parks, utility systems, and some agricultural or open lands depend on dependable water supply in an arid environment. Continued development and landscape irrigation needs increase sensitivity to prolonged drought and constrained water availability. **Impacts:** Drought can increase pressure on local conservation measures, reduce irrigation reliability, stress vegetation and public landscapes, and raise operating costs for water delivery and infrastructure management. It can also elevate wildfire risk, affect outdoor amenities, and require longer-term adjustments to growth and utility planning. Critical facilities and infrastructure potentially impacted include Toquerville culinary water, irrigation, wastewater, storage, pumping, and distribution infrastructure; Toquerville Town Hall and municipal facilities; Toquerville fire and emergency response facilities; public works and utility facilities; schools and community facilities serving the area; parks, trails, public landscapes, residential irrigation systems, fire protection water supplies, nearby agricultural and open-space irrigation systems, utility corridors, and public buildings vulnerable to reduced water availability, conservation requirements, vegetation stress, higher utility management costs, and increased wildfire risk.
Leeds	**Vulnerabilities:** Leeds is vulnerable where homes, community facilities, utility systems, landscaping, and limited local water supplies are exposed to prolonged drought in a small community setting. Its location along major travel routes and dependence on a relatively small infrastructure base can make drought-related water management challenges more difficult to absorb. **Impacts:** Drought can reduce water supply flexibility, stress landscaping and vegetation, increase conservation demands, and raise maintenance costs for community facilities and utility systems. It may also increase wildfire risk, affect roadside and open-space vegetation, and place added pressure on local planning for long-term water reliability. Critical facilities and

Plan Participant	Vulnerabilities and Impacts
	infrastructure potentially impacted include Leeds local water, wastewater, storage, pumping, and distribution infrastructure; Leeds Town Hall and public works facilities; Leeds fire and emergency response facilities; community facilities; parks, public landscapes, residential irrigation systems, fire protection water supplies, utility corridors, roadside vegetation, open-space areas, and public buildings vulnerable to reduced water supply flexibility, conservation demands, vegetation stress, higher maintenance costs, and increased wildfire risk along community edges and transportation corridors.
Virgin	**Vulnerabilities:** Virgin is vulnerable because residents, lodging, restaurants, visitor-serving businesses, parks, and utility systems depend on reliable water supply in the Zion gateway corridor. Limited local infrastructure, tourism-related seasonal demand, and an arid setting increase sensitivity to prolonged drought, conservation requirements, and vegetation stress. **Impacts:** Drought can strain local water systems, increase conservation pressure on residents and businesses, stress landscaped and natural areas, and affect the appearance and function of visitor-serving spaces. It can also contribute to wildfire risk, reduce resilience of vegetation along the corridor, and create economic impacts if drought conditions affect tourism experience or operating costs. Critical facilities and infrastructure potentially impacted include Virgin public works, water, wastewater, storage, pumping, and distribution infrastructure; Virgin Town Hall and municipal facilities; Virgin fire and emergency response facilities; lodging, restaurants, visitor-serving businesses, parks, trailheads, campgrounds, public landscapes, fire protection water supplies, utility corridors, residential irrigation systems, and Zion gateway recreation assets vulnerable to reduced water availability, conservation restrictions, stressed vegetation, higher operating costs, reduced visitor-serving landscape quality, and increased wildfire risk.
Springdale	**Vulnerabilities:** Springdale is highly vulnerable because residents, hotels, restaurants, visitor facilities, parks, and municipal systems in the Zion gateway corridor depend on reliable water supply and attractive landscape conditions in a very arid environment. High visitor volumes, limited corridor capacity, and dependence on local and regional water systems increase sensitivity to prolonged drought and conservation needs.

Plan Participant	Vulnerabilities and Impacts
	Impacts: Drought can increase water supply and demand pressures, stress landscaping and vegetation, raise costs for hotels, businesses, and local government operations, and affect visitor experience in the gateway area. It can also heighten wildfire risk, reduce resilience of natural and landscaped areas, and create broader economic impacts because of the town's reliance on tourism. Critical facilities and infrastructure potentially impacted include Springdale municipal water, wastewater, storage, pumping, and distribution systems; Springdale Town Hall and municipal facilities; Springdale Police Department and emergency response facilities; public works facilities; hotels, restaurants, lodging areas, employee housing, visitor facilities, parks, trailheads, shuttle-related facilities, public landscapes, fire protection water supplies, utility corridors, and Zion gateway recreation assets vulnerable to reduced water supply reliability, conservation requirements, stressed vegetation, higher operating costs for visitor-serving facilities, and increased wildfire risk in the canyon corridor.
New Harmony	**Vulnerabilities:** New Harmony is vulnerable because homes, roads, water systems, agricultural and open lands, and community facilities depend on limited local water availability in a rural mountain-valley setting. Drought can affect both domestic water reliability and surrounding vegetation, forage, and natural resources that support the community's rural character. **Impacts:** Drought can reduce water supply reliability, stress local vegetation and agricultural lands, increase wildfire danger, and raise costs for maintaining community water systems and public spaces. It may also affect road dust control, emergency response conditions, and long-term resilience where local staffing and resources are limited. Critical facilities and infrastructure potentially impacted include New Harmony local and domestic water systems, wells, storage, pumping, and distribution infrastructure; New Harmony Town Hall and municipal facilities; fire and emergency response facilities; public works, water, wastewater, drainage, and utility infrastructure; agricultural and open lands, irrigation systems, livestock water supplies, parks, community facilities, public landscapes, rural access roads, fire protection water supplies, and utility corridors vulnerable to reduced water reliability, vegetation and forage stress, increased wildfire danger, dust, and higher maintenance and operating costs.
Rockville	**Vulnerabilities:** Rockville is vulnerable because its small residential and historic community, local water systems, vegetation, and visitor-serving environment along the Virgin River corridor depend on limited water supplies in an arid setting. The town's small size, historic resources, and constrained infrastructure increase sensitivity to prolonged drought and vegetation stress.

Plan Participant	Vulnerabilities and Impacts
	Impacts: Drought can strain local water supply and conservation efforts, stress community vegetation and historic landscape character, and increase wildfire risk in and around the town. It may also affect quality of life, visitor experience, and maintenance costs for public spaces and historic or scenic resources that support the local economy. Critical facilities and infrastructure potentially impacted include Rockville local water, wastewater, storage, pumping, and distribution systems; Rockville Town Hall and municipal facilities; fire and emergency response facilities; public works and utility infrastructure; historic and residential landscapes, parks, public spaces, visitor-serving facilities, Virgin River corridor vegetation, fire protection water supplies, utility corridors, public buildings, and scenic or historic community resources vulnerable to reduced water availability, conservation requirements, vegetation stress, higher maintenance costs, and increased wildfire risk.
Apple Valley	**Vulnerabilities:** Apple Valley is vulnerable where dispersed residential development, community water systems, roads, and some agricultural or open lands rely on limited water availability in a rural-desert environment. The town's dispersed layout and dependence on modest local infrastructure increase sensitivity to prolonged drought, vegetation stress, and conservation needs. **Impacts:** Drought can reduce water supply reliability, increase pressure on local conservation measures, stress vegetation and open-space resources, and raise costs for water system operation and maintenance. It can also heighten wildfire risk, affect rural property conditions, and create service challenges if multiple dispersed areas experience water stress at the same time. Critical facilities and infrastructure potentially impacted include Apple Valley community water systems, wells, storage, pumping, and distribution infrastructure; Apple Valley Town Hall and municipal facilities; fire and emergency response facilities; public works, water, wastewater, drainage, and utility infrastructure; dispersed residential water systems, rural access roads, open-space resources, parks, community facilities, fire protection water supplies, utility corridors, and limited agricultural or livestock water infrastructure vulnerable to reduced water reliability, conservation requirements, vegetation stress, dust, increased wildfire risk, and service challenges across dispersed neighborhoods.
Hildale	**Vulnerabilities:** Hildale is vulnerable where homes, schools, utility and water systems, public facilities, and surrounding vegetation depend on limited water supplies in a rugged, arid setting. Existing infrastructure needs, local growth pressures, and dependence on community water systems increase sensitivity to prolonged drought and conservation requirements.

Plan Participant	Vulnerabilities and Impacts
	Impacts: Drought can strain municipal and community water systems, stress vegetation and public landscapes, increase wildfire danger, and raise costs for water delivery and infrastructure management. It may also affect schools, public facilities, and household water reliability, creating added pressure on a community with ongoing infrastructure and service challenges. Critical facilities and infrastructure potentially impacted include Hildale municipal and community water systems, culinary water storage, pumping, wastewater, stormwater, drainage, and distribution infrastructure; Hildale City Hall and municipal facilities; Hildale Police Department; Hildale fire and emergency response facilities; Water Canyon School and other community facilities; public works facilities, residential water systems, parks, public landscapes, fire protection water supplies, utility corridors, drainage-sensitive open areas, and public buildings vulnerable to reduced water availability, conservation requirements, vegetation stress, higher infrastructure management costs, increased wildfire danger, and household water reliability concerns.

Earthquake

Table 164 summarizes earthquake vulnerabilities and potential impacts for Washington County participants.

Table 164: Earthquake Vulnerability and Impact Assessment for Washington County

Plan Participant	Vulnerabilities and Impacts
Washington County	**Vulnerabilities:** Washington County is highly vulnerable to earthquake because it lies near the Hurricane Fault Zone and other active seismic sources and contains the county's largest concentration of people, homes, businesses, public facilities, utilities, transportation corridors, and critical infrastructure. Vulnerable assets include older or unreinforced masonry buildings, schools, bridges, water and wastewater systems, overhead and buried utilities, public safety facilities, and communities in river corridors or soft-sediment settings where shaking may be amplified and secondary hazards such as liquefaction, rockfall, or landslides may occur. The hazard profile identifies countywide extensive exposure and notes likely school-related URM[254] concerns. **Impacts:** Earthquake impacts could include injuries, structural and nonstructural building damage, utility outages, damage to roads and bridges, disruption of emergency response and regional travel, and prolonged interruption of public services and commerce. Countywide consequences may also include landslides or rockfall in steep terrain, localized liquefaction along river corridors, damage to older buildings and schools, and high recovery costs associated with repairing lifeline systems and public facilities. Critical facilities and infrastructure potentially impacted include Washington County

[254] URM = unreinforced masonry

Plan Participant	Vulnerabilities and Impacts
	Sheriff's Office; Washington County Emergency Management; St. George 911 Communications Center; Southwest Utah Public Health Department; St. George Regional Hospital; Washington County School District facilities; county and municipal government buildings; public safety facilities; emergency operations and communications facilities; Interstate 15, State Route 9, State Route 7, State Route 18, and other regional roads, bridges, culverts, retaining walls, and evacuation routes; St. George Regional Airport; Washington County Water Conservancy District reservoirs, dams, pipelines, pump stations, water storage, and distribution infrastructure; municipal water, wastewater, stormwater, and drainage systems; power substations, overhead and underground electric lines, communications towers, fiber and cellular infrastructure, fuel supply points, public works yards, parks, recreation facilities, and older or unreinforced masonry buildings vulnerable to ground shaking, utility failure, bridge damage, liquefaction, rockfall, landslides, and access disruption.
St. George	**Vulnerabilities:** St. George is highly vulnerable because of its large population, dense residential and commercial development, schools, medical facilities, utilities, major arterials, and regional service functions located near active fault influence and in valley settings where shaking may be amplified. Older buildings, critical facilities, water and wastewater infrastructure, bridges, and transportation corridors are especially susceptible to ground shaking and service disruption. **Impacts:** An earthquake could cause injuries, damage to homes, businesses, schools, hospitals, roads, and utilities, and major disruption to emergency response, health care access, and regional commerce. Utility outages, blocked roads, damage to older buildings, and interruption of government and business operations could create countywide cascading impacts because St. George serves as the region's principal urban and service center. Critical facilities and infrastructure potentially impacted include St. George City Hall and municipal government facilities; St. George Police Department; St. George Fire Department stations; St. George 911 Communications Center; St. George Regional Hospital; Utah Tech University facilities; Washington County School District schools and support facilities; St. George Regional Airport; public works, water, wastewater, stormwater, and drainage facilities; Interstate 15, State Route 7, Bluff Street, River Road, St. George Boulevard, bridges, culverts, retaining walls, traffic signals, and major arterials; Washington County Water Conservancy District facilities serving the St. George area; power substations, overhead and underground utilities, communications equipment, medical offices, commercial centers, hotels, warehouses, public buildings, older or unreinforced masonry structures, parks, and recreation facilities vulnerable to structural damage, nonstructural damage, utility outages, road closures, liquefaction, slope instability, and emergency access disruption.
Washington City	**Vulnerabilities:** Washington City is vulnerable because of its proximity to the Hurricane Fault Zone, continued rapid growth, and concentration of homes, schools, public facilities, arterial roads, and utility systems. Development on

Plan Participant	Vulnerabilities and Impacts
	valley sediments and the city's history of strong shaking during the 1992 Washington City area earthquake increase sensitivity to ground motion, nonstructural damage, and disruption of essential services. **Impacts:** Earthquake impacts could include injuries, damage to homes and community facilities, utility interruptions, and disruption of roads, schools, and local government operations. Strong shaking could also damage older or more vulnerable buildings, interrupt water and wastewater service, and create recovery costs associated with debris removal, inspections, and infrastructure repair. Critical facilities and infrastructure potentially impacted include Washington City offices and municipal facilities; Washington City Police Department; Washington City Fire Department facilities; Washington County School District schools and community facilities; public works facilities; culinary water, irrigation, wastewater, stormwater, drainage, and flood-control infrastructure; Interstate 15, State Route 9, Telegraph Street, Green Spring Drive, bridges, culverts, traffic signals, retaining walls, and major access routes; Washington County Water Conservancy District facilities serving the Washington area; power, communications, and utility infrastructure; parks, sports fields, trail systems, commercial centers, public buildings, older structures, and community facilities vulnerable to earthquake shaking, utility interruption, roadway damage, liquefaction in soft-sediment areas, and disruption of emergency response and evacuation access.
Hurricane	**Vulnerabilities:** Hurricane is highly vulnerable because of its location near the Hurricane Fault Zone, growing population, schools, public facilities, bridges, utilities, and development along the Hurricane Valley and nearby river and wash corridors. Ground shaking could be amplified in sediment-filled areas, and the city's transportation and utility networks are susceptible to damage and service interruption during a significant earthquake. **Impacts:** Potential impacts include injuries, structural and nonstructural damage to homes and businesses, utility outages, and disruption of schools, roads, bridges, and emergency response. Earthquake damage could also interrupt commerce and recreation travel, trigger limited slope instability or rockfall in nearby steeper terrain, and require costly repair of public infrastructure. Critical facilities and infrastructure potentially impacted include Hurricane City Hall and municipal facilities; Hurricane Police Department; Hurricane Valley Fire District facilities; Washington County School District schools and community facilities; public works, water, wastewater, stormwater, drainage, irrigation, storage, pumping, and distribution infrastructure; Interstate 15 access routes, State Route 9, State Route 7, State Route 59, bridges, culverts, retaining walls, traffic signals, and evacuation routes; Sand Hollow Reservoir and Quail Creek Reservoir recreation-support, dam, spillway, access, and utility infrastructure; power substations, overhead and underground utilities, communications infrastructure, commercial areas, parks, trailheads, campgrounds, marinas, tourism businesses, and lightweight or older structures vulnerable to ground shaking, utility outages, bridge or road

Plan Participant	Vulnerabilities and Impacts
	damage, liquefaction in sediment-filled areas, slope instability, and access disruption.
Santa Clara	**Vulnerabilities:** Santa Clara is vulnerable because homes, schools, parks, public buildings, roads, and utility systems are exposed to strong ground shaking in the St. George urban area near active fault influence. Older or more lightly built structures, overhead and underground utilities, and transportation connections may be susceptible to shaking damage and service interruption. **Impacts:** Earthquake impacts could include injuries, building damage, utility outages, roadway disruption, and interruption of city operations, schools, and neighborhood access. Strong shaking may also damage retaining walls, public facilities, and community infrastructure and increase recovery costs tied to inspections, repairs, and emergency operations. Critical facilities and infrastructure potentially impacted include Santa Clara City Hall and municipal facilities; Santa Clara-Ivins Police Department facilities; Santa Clara fire and emergency response facilities; Washington County School District schools and community facilities; public works, water, wastewater, stormwater, drainage, irrigation, storage, pumping, and distribution systems; Old Highway 91, Santa Clara Drive, bridges, culverts, retaining walls, traffic signals, and local access routes; Santa Clara River corridor infrastructure; power, communications, and utility infrastructure; parks, trails, recreation facilities, public buildings, commercial areas, older structures, and community facilities vulnerable to ground shaking, utility interruption, road and bridge damage, retaining wall failure, liquefaction near river sediments, and emergency access disruption.
Ivins	**Vulnerabilities:** Ivins is vulnerable where homes, public facilities, roads, utilities, and tourism-related amenities are exposed to ground shaking in a desert valley setting influenced by nearby active faults and local slope transitions. Development near steeper terrain and reliance on limited transportation and utility connections increase sensitivity to shaking damage, rockfall, and service disruption. **Impacts:** Potential impacts include building damage, utility outages, roadway obstruction, and interruption of public services, recreation access, and emergency response. Ground shaking could also trigger localized rockfall or slope instability in susceptible areas and create costly repair needs for roads, utilities, and public facilities. Critical facilities and infrastructure potentially impacted include Ivins City Hall and municipal facilities; Santa Clara-Ivins Police Department facilities serving Ivins; Ivins fire and emergency response facilities; Washington County School District schools and community facilities; public works, water, wastewater, stormwater, drainage, irrigation, storage, pumping, and distribution infrastructure; Old Highway 91, Center Street, local access routes, bridges, culverts, retaining walls, and traffic-control devices; overhead and underground power and communications infrastructure; parks, trailheads, recreation facilities, public buildings, tourism-related amenities, utility equipment, and structures near slope transitions or desert-edge terrain vulnerable to earthquake shaking, rockfall, slope instability, utility outages, roadway damage, and disrupted emergency access.

Plan Participant	Vulnerabilities and Impacts
La Verkin	**Vulnerabilities:** La Verkin is highly vulnerable because of its proximity to the Hurricane Fault Zone, location near the Virgin River corridor, and exposure of homes, schools, roads, bridges, utilities, and public facilities to strong shaking and secondary hazards. River sediments and nearby steeper terrain may increase susceptibility to amplified shaking, localized liquefaction, rockfall, or landslide-related impacts. **Impacts:** Earthquake impacts could include injuries, damage to buildings and bridges, utility outages, blocked roads, and interruption of emergency response and access to nearby communities. Secondary ground failure, including limited liquefaction or slope instability, could further affect transportation, river corridor infrastructure, and recovery operations. Critical facilities and infrastructure potentially impacted include La Verkin City offices and municipal facilities; La Verkin Police Department; La Verkin fire and emergency response facilities; Washington County School District schools and community facilities; public works, water, wastewater, stormwater, drainage, storage, pumping, and utility infrastructure; State Route 9, State Route 17, local bridges, culverts, retaining walls, traffic-control devices, and Zion gateway access routes; La Verkin Creek and Virgin River corridor infrastructure; overhead and underground electric and communications infrastructure; parks, trailheads, visitor-serving businesses, public buildings, and utility corridors vulnerable to strong shaking, bridge and road damage, liquefaction or ground failure near river sediments, rockfall, landslides, utility outages, and access disruption.
Enterprise	**Vulnerabilities:** Enterprise is vulnerable where homes, schools, agricultural buildings, local businesses, roads, and utility systems are exposed in a rural setting with limited redundancy and some older building stock. Historic earthquakes near Enterprise and the broader county demonstrate that even moderate events can affect this community, and limited alternate routes and service capacity can increase vulnerability. **Impacts:** Potential impacts include structural and nonstructural damage to homes, schools, barns, and public buildings; utility outages; and disruption of local roads, emergency response, and school or business operations. Recovery may be prolonged where staffing, equipment, and financial resources are limited and outside assistance is needed for inspections and repairs. Critical facilities and infrastructure potentially impacted include Enterprise City offices and municipal facilities; Enterprise Police Department; Enterprise fire and emergency response facilities; Washington County School District schools and community facilities; public works, water, wastewater, drainage, stormwater, irrigation, storage, pumping, and agricultural water infrastructure; State Route 18, local roads, bridges, culverts, retaining walls, traffic-control devices, and rural access routes; power and communications infrastructure; agricultural buildings, barns, sheds, corrals, irrigation equipment, maintenance yards, parks, public buildings, older structures, and utility corridors vulnerable to ground shaking, structural and nonstructural damage, utility outages, road or

Plan Participant	Vulnerabilities and Impacts
	culvert damage, limited access, and delayed emergency response in a rural setting.
Toquerville	**Vulnerabilities:** Toquerville is vulnerable because growing residential areas, roads, utilities, and public facilities are exposed to strong ground shaking in an area influenced by active faults, drainage corridors, and nearby steeper terrain. Continued growth adds more structures and infrastructure that may be affected by shaking damage, nonstructural failures, and limited access disruption. **Impacts:** Earthquake impacts could include injuries, damage to homes and infrastructure, utility outages, roadway disruption, and interruption of public services and emergency access. Shaking may also contribute to localized slope or embankment instability and create significant repair costs for transportation and utility systems. Critical facilities and infrastructure potentially impacted include Toquerville Town Hall and municipal facilities; Toquerville fire and emergency response facilities; public works and utility facilities; Washington County School District schools and community facilities serving the area; culinary water, irrigation, wastewater, stormwater, drainage, storage, pumping, and distribution infrastructure; State Route 17, Interstate 15 access routes, local roads, bridges, culverts, retaining walls, traffic-control devices, and evacuation routes; power and communications infrastructure; parks, trails, public buildings, visitor-serving facilities, and structures near benches, drainage corridors, or slope transitions vulnerable to earthquake shaking, utility damage, roadway disruption, localized slope instability, retaining wall failure, and interrupted access.
Leeds	**Vulnerabilities:** Leeds is vulnerable where homes, Interstate 15 connections, local roads, utilities, and community facilities are exposed near active fault influence, steep slopes, and geologic constraints. The town's location near major transportation corridors and more rugged terrain increases sensitivity to shaking damage, rockfall, embankment failure, and service disruption. **Impacts:** Potential impacts include damage to buildings, utility outages, blocked roads, disruption of interstate and local access, and interruption of emergency response and daily travel. Secondary impacts such as rockfall or slope instability could create broader regional transportation consequences and increase repair costs for infrastructure and public services. Critical facilities and infrastructure potentially impacted include Leeds Town Hall and public works facilities; Leeds fire and emergency response facilities; water, wastewater, stormwater, drainage, storage, pumping, and utility infrastructure; Interstate 15, Main Street, local roads, bridges, culverts, retaining walls, traffic-control devices, and access routes; overhead and underground electric and communications infrastructure; parks, public buildings, community facilities, and corridor-related infrastructure vulnerable to ground shaking, rockfall, slope instability, roadway and bridge damage, utility outages, and disruption of emergency access and regional travel along Interstate 15.

Plan Participant	Vulnerabilities and Impacts
Virgin	**Vulnerabilities:** Virgin is vulnerable because homes, businesses, SR-9, lodging, utility systems, and visitor-serving facilities are concentrated in the Zion gateway corridor near the Virgin River and steep terrain where strong shaking and secondary hazards could affect both residents and visitors. Limited transportation access and reliance on a small infrastructure base increase sensitivity to earthquake disruption. **Impacts:** Earthquake impacts could include building damage, utility interruption, hazardous travel conditions, and disruption of SR-9 access, evacuation, and emergency response. Secondary effects such as rockfall, slope instability, or river corridor ground failure could worsen damage, reduce visitor access, and create economic losses tied to tourism and local commerce. Critical facilities and infrastructure potentially impacted include Virgin Town Hall and municipal facilities; Virgin fire and emergency response facilities; public works, water, wastewater, drainage, storage, pumping, and utility infrastructure; State Route 9, local roads, bridges, culverts, retaining walls, traffic-control devices, and Zion gateway access routes; Virgin River corridor infrastructure; overhead and underground electric and communications infrastructure; lodging, restaurants, visitor-serving businesses, parks, trailheads, campgrounds, public buildings, and utility corridors vulnerable to earthquake shaking, rockfall, slope instability, river-corridor ground failure, utility outages, road closures, and interrupted access for residents and visitors.
Springdale	**Vulnerabilities:** Springdale is highly vulnerable because it is located in a narrow Zion gateway corridor with steep slopes, high visitor volumes, constrained transportation access, and development near the Virgin River. Homes, hotels, businesses, roads, bridges, utilities, and public facilities are exposed not only to strong shaking but also to secondary hazards such as landslides, rockfall, and localized ground failure, as demonstrated by the 1992 earthquake-triggered landslide that destroyed homes and blocked Highway 9.[255] **Impacts:** Potential impacts include injuries, damage to buildings and utilities, closure of SR-9 and access routes, interruption of tourism and park access, and major disruption of evacuation and emergency response. Even a moderate earthquake could trigger slope failures or rockfall with outsized consequences for life safety, transportation, visitor activity, and local economic recovery. Critical facilities and infrastructure potentially impacted include Springdale Town Hall and municipal facilities; Springdale Police Department and emergency response facilities; public works, water, wastewater, drainage, stormwater, storage, pumping, and utility infrastructure; State Route 9, Zion Canyon access routes, shuttle-related transportation

[255] Utah Geological Survey, Investigation of Geologic Effects Associated with the September 2, 1992, St. George Earthquake, September 24, 1992. https://geodata.geology.utah.gov/pages/download.php?direct=1&noattach=true&ref=11053&ext=pdf. Source for structural damage in Hurricane and New Harmony and the Springdale landslide, destroyed homes, and SR-9 blockage.

Plan Participant	Vulnerabilities and Impacts
	facilities, bridges, culverts, retaining walls, traffic-control devices, and local access routes; Virgin River corridor infrastructure; overhead and underground electric and communications infrastructure; hotels, restaurants, lodging areas, employee housing, visitor facilities, parks, trailheads, public buildings, and Zion gateway recreation assets vulnerable to strong shaking, rockfall, landslides, road blockage, utility outages, building damage, evacuation constraints, and disruption of visitor access.
New Harmony	**Vulnerabilities:** New Harmony is vulnerable where homes, roads, water systems, agricultural lands, and community facilities are exposed in a rural mountain-valley setting with limited alternate access and older structures. The 1992 earthquake caused damage in New Harmony, illustrating that even moderate regional earthquakes can affect this community through shaking damage and infrastructure disruption.[256] **Impacts:** Earthquake impacts could include damage to homes and community buildings, utility interruptions, roadway damage, and disruption of emergency response, school travel, and local services. Recovery may be slower where local staffing and resources are limited and outside technical assistance is required for inspections, repairs, and restoration of water and transportation systems. Critical facilities and infrastructure potentially impacted include New Harmony Town Hall and municipal facilities; fire and emergency response facilities; public works, local and domestic water systems, wells, storage, pumping, wastewater, drainage, and utility infrastructure; Interstate 15, State Route 144, local roads, bridges, culverts, retaining walls, traffic-control devices, and rural access routes; Ash Creek watershed drainage crossings; power and communications infrastructure; parks, community facilities, agricultural support facilities, public buildings, older structures, and utility corridors vulnerable to ground shaking, building damage, utility interruption, roadway damage, slope instability, and isolation or delayed emergency response in a rural mountain-valley setting.
Rockville	**Vulnerabilities:** Rockville is highly vulnerable because of its small historic and residential development pattern along the Virgin River corridor, constrained access, and proximity to steep terrain and Zion-related travel. Historic and older structures, roads, bridges, utilities, and public spaces are susceptible to strong shaking and to secondary hazards such as rockfall, landslides, and embankment failure.

[256] Utah Geological Survey, Investigation of Geologic Effects Associated with the September 2, 1992, St. George Earthquake, September 24, 1992. https://geodata.geology.utah.gov/pages/download.php?direct=1&noattach=true&ref=11053&ext=pdf. Source for structural damage in Hurricane and New Harmony and the Springdale landslide, destroyed homes, and SR-9 blockage.

Plan Participant	Vulnerabilities and Impacts
	Impacts: Potential impacts include damage to homes and historic resources, blocked roads, utility outages, and disruption of access for residents and visitors. Because transportation options are limited and the community is small, even localized earthquake damage or slope failure could significantly affect evacuation, emergency response, tourism activity, and long-term recovery. Critical facilities and infrastructure potentially impacted include Rockville Town Hall and municipal facilities; fire and emergency response facilities; public works, water, wastewater, drainage, storage, pumping, and utility infrastructure; State Route 9, local roads, bridges, culverts, retaining walls, traffic-control devices, and Zion gateway access routes; Virgin River corridor infrastructure; overhead and underground electric and communications infrastructure; historic buildings, homes, parks, trailheads, visitor-serving facilities, public buildings, and utility corridors vulnerable to ground shaking, rockfall, landslides, retaining wall failure, road blockage, utility outages, and disrupted emergency access in a constrained gateway corridor.
Apple Valley	**Vulnerabilities:** Apple Valley is vulnerable where dispersed residential development, local roads, water and utility systems, and community facilities are exposed in a rural setting with limited infrastructure redundancy. Homes, small public facilities, and utility connections may be susceptible to shaking damage and prolonged service interruption because of the community's dispersed layout and dependence on modest local systems. **Impacts:** Earthquake impacts could include structural and nonstructural damage to homes, utility outages, roadway disruption, and interruption of access to essential services and emergency response. Recovery could be challenging if multiple dispersed areas are affected at once or if inspections, utility repairs, and road restoration require outside assistance. Critical facilities and infrastructure potentially impacted include Apple Valley Town Hall and municipal facilities; fire and emergency response facilities; public works, community water systems, wells, storage, pumping, wastewater, drainage, and utility infrastructure; State Route 59, local roads, bridges, culverts, washes, retaining walls, traffic-control devices, and rural access routes; overhead and underground electric and communications infrastructure; parks, community facilities, dispersed residential water systems, public buildings, older or lightweight structures, and utility corridors vulnerable to earthquake shaking, utility outages, roadway damage, wash crossing failure, limited access, and delayed emergency response across dispersed neighborhoods.
Hildale	**Vulnerabilities:** Hildale is vulnerable where homes, schools, roads, utility and water systems, and public facilities are exposed in a rugged terrain setting with drainage-sensitive development and limited infrastructure redundancy. Strong shaking could damage buildings, utilities, and transportation links, and the community's infrastructure needs and remote setting can increase sensitivity to prolonged disruption. **Impacts:** Potential impacts include injuries, building damage, utility and water service interruption, blocked roads, and disruption of emergency response,

Plan Participant	Vulnerabilities and Impacts
	schools, and public safety operations. In a community with ongoing infrastructure needs, recovery may require outside technical and financial assistance and could be complicated by limited alternate access and service capacity. Critical facilities and infrastructure potentially impacted include Hildale City Hall and municipal facilities; Hildale Police Department; Hildale fire and emergency response facilities; Water Canyon School and other community facilities; public works, culinary water, wastewater, stormwater, drainage, storage, pumping, and utility infrastructure; Utah State Route 59, local roads, bridges, culverts, washes, retaining walls, traffic-control devices, and community access routes; overhead and underground electric and communications infrastructure; parks, public buildings, residential water systems, utility corridors, and structures in rugged or drainage-sensitive areas vulnerable to ground shaking, building damage, utility and water service interruption, road blockage, rockfall, slope instability, and isolation.

Extreme Heat

Table 165 summarizes extreme-heat vulnerabilities and potential impacts for Washington County participants.

Table 165: Extreme Heat Vulnerability and Impact Assessment for Washington County

Plan Participant	Vulnerabilities and Impacts
Washington County	**Vulnerabilities:** Washington County is vulnerable to extreme heat because high summer temperatures can affect older adults, outdoor workers, recreation users, and visitors, especially when overnight relief, shade, water, or reliable cooling are limited. Vulnerable assets include public health and social service systems, county facilities, roads, utilities, parks, state and national park access areas, landscaping, agricultural operations, and communities dependent on reliable cooling, water supply, and electric service. Future warming may increase heat stress; no projection-specific day count is assigned without an identified model, baseline, and reporting period.[257] **Impacts:** Extreme heat can cause dehydration, heat exhaustion, heat stroke, and heat-related deaths; increase demand for cooling centers, emergency response, and health care; strain the electric grid and water systems; and reduce outdoor work productivity and recreation safety. Countywide impacts may also include vegetation stress, degraded park and landscape conditions, increased wildfire risk, harmful algal bloom concerns, and economic effects tied to tourism, construction, and agriculture.

[257] U.S. Global Change Research Program, Fifth National Climate Assessment (2023), Chapter 28, Southwest, particularly heat-related risks in Key Message 28.3. https://nca2023.globalchange.gov/downloads/NCA5_Ch28_Southwest.pdf. The future-conditions statement is qualitative and does not assign a county-specific projected day count.

Plan Participant	Vulnerabilities and Impacts
	Critical facilities and infrastructure potentially impacted include Washington County Sheriff's Office; Washington County Emergency Management; St. George 911 Communications Center; Southwest Utah Public Health Department; St. George Regional Hospital; Washington County School District facilities; county and municipal government buildings; public safety facilities; cooling centers and public shelter locations; senior centers, libraries, community centers, and health care facilities; Interstate 15, State Route 9, State Route 7, State Route 18, and other regional roadways, bridges, traffic signals, and emergency access routes; St. George Regional Airport; electric substations, overhead and underground distribution systems, communications towers, cellular and internet infrastructure, fuel supply points, municipal and domestic water systems, reservoirs, wells, pump stations, water storage, wastewater systems, parks, trailheads, campgrounds, recreation areas, agricultural water infrastructure, livestock water supplies, public landscapes, and visitor-serving infrastructure vulnerable to heat-related power demand, water demand, pavement stress, cooling system strain, vegetation stress, worker exposure, recreation safety impacts, and service disruption.
St. George	**Vulnerabilities:** St. George is highly vulnerable because summer heat affects a growing population, a large share of older adults, outdoor workers, and substantial visitor and recreation activity. Homes, schools, medical facilities, parks, roads, utility systems, landscaped areas, and businesses all depend on reliable cooling, power, and water during prolonged heat events. **Impacts:** Extreme heat can increase heat illness and mortality risk, strain hospitals and emergency services, raise electricity demand, stress the power grid, and increase water use and cooling costs. It can also damage pavement and infrastructure, reduce outdoor labor productivity, affect public events and recreation, and create broader economic and quality-of-life impacts in the county's principal urban center. Critical facilities and infrastructure potentially impacted include St. George City Hall and municipal government facilities; St. George Police Department; St. George Fire Department stations; St. George 911 Communications Center; St. George Regional Hospital; Utah Tech University facilities; Washington County School District schools and support facilities; senior centers, libraries, community centers, cooling centers, medical offices, and public-facing facilities; St. George Regional Airport; public works, water, wastewater, stormwater, and drainage facilities; Interstate 15, State Route 7, Bluff Street, River Road, St. George Boulevard, traffic signals, bridges, transit stops, sidewalks, and major arterials; electric substations, overhead and underground power systems, communications equipment, hotels, commercial centers, recreation facilities, parks, golf courses, sports fields, trail systems, public landscapes, and visitor-serving infrastructure vulnerable to peak electricity demand, cooling system strain, pavement and asphalt stress, increased water use, heat exposure for outdoor workers and visitors, vegetation decline, and service interruption.

Plan Participant	Vulnerabilities and Impacts
Washington City	**Vulnerabilities:** Washington City is vulnerable where growing neighborhoods, schools, parks, commercial areas, and utility systems are exposed to prolonged high temperatures in the lower Washington County heat zone. Population growth, outdoor work, landscape irrigation, and dependence on cooling and reliable power increase the city's sensitivity to extreme heat. **Impacts:** Extreme heat can increase heat-related illness, strain local power demand and water use, stress landscaped areas and public facilities, and raise operating costs for cooling and irrigation. It may also disrupt outdoor activities, reduce construction productivity, increase wildfire risk at the community edge, and create added demand on public information and emergency response services. Critical facilities and infrastructure potentially impacted include Washington City offices and municipal facilities; Washington City Police Department; Washington City Fire Department facilities; schools and community facilities; senior centers, libraries, cooling centers, and public gathering locations; public works facilities; culinary water, irrigation, wastewater, stormwater, drainage, storage, pumping, and distribution infrastructure; Interstate 15, State Route 9, Telegraph Street, Green Spring Drive, traffic signals, local bridges, sidewalks, and major access routes; electric and communications infrastructure; parks, sports fields, trail systems, public landscapes, commercial centers, residential cooling systems, fire protection water supplies, and community facilities vulnerable to peak power demand, increased water and irrigation needs, cooling system strain, pavement stress, heat exposure for outdoor workers, and disruption of public services during prolonged heat events.
Hurricane	**Vulnerabilities:** Hurricane is vulnerable because residents, schools, parks, businesses, utility systems, and outdoor recreation users are exposed to prolonged summer heat in a fast-growing area with strong seasonal demand and outdoor activity. Outdoor workers, older adults, and visitors using nearby trails and recreation areas are especially susceptible to heat illness. **Impacts:** Extreme heat can increase medical incidents, stress power and water systems, reduce worker productivity, and raise costs for cooling, irrigation, and public facility operations. Heat may also affect parks and recreation use, increase wildfire risk, strain landscaping and vegetation, and disrupt outdoor events and daily routines. Critical facilities and infrastructure potentially impacted include Hurricane City Hall and municipal facilities; Hurricane Police Department; Hurricane Valley Fire District facilities; Washington County School District schools and community facilities; senior centers, libraries, cooling centers, and public facilities; public works, water, wastewater, stormwater, drainage, irrigation, storage, pumping, and distribution infrastructure; Interstate 15 access routes, State Route 9, State Route 7, State Route 59, traffic signals, bridges, sidewalks, and evacuation routes; electric and communications infrastructure; Sand Hollow Reservoir and Quail Creek Reservoir recreation-support facilities; parks, trailheads, campgrounds, marinas, commercial areas, tourism businesses, fire protection water supplies,

Plan Participant	Vulnerabilities and Impacts
	public landscapes, and outdoor recreation assets vulnerable to heat illness exposure, increased cooling and water demand, power system strain, pavement stress, vegetation decline, and reduced recreation safety.
Santa Clara	**Vulnerabilities:** Santa Clara is vulnerable where homes, schools, parks, community facilities, landscaped areas, and utility systems are exposed to persistent summer heat within the greater St. George urban area. Older adults, outdoor workers, and residents without adequate cooling are particularly vulnerable, and urban heat island conditions can increase nighttime heat exposure. **Impacts:** Extreme heat can cause heat illness, increase demand for cooling and public information, stress electric and water systems, and raise costs for maintaining public landscapes and facilities. It can also reduce comfort and safety for outdoor activities, damage vegetation, and elevate wildfire risk near the community edge. Critical facilities and infrastructure potentially impacted include Santa Clara City Hall and municipal facilities; Santa Clara-Ivins Police Department facilities; Santa Clara fire and emergency response facilities; Washington County School District schools and community facilities; senior centers, libraries, cooling centers, and public gathering spaces; public works, water, wastewater, stormwater, drainage, irrigation, storage, pumping, and distribution systems; Old Highway 91, Santa Clara Drive, traffic signals, sidewalks, local access routes, and emergency routes; electric and communications infrastructure; parks, trails, recreation facilities, public landscapes, street trees, community open spaces, residential cooling systems, fire protection water supplies, and public buildings vulnerable to prolonged heat, increased electricity and water demand, cooling system strain, vegetation stress, heat exposure for residents and outdoor workers, and wildfire potential near community edges.

Plan Participant	Vulnerabilities and Impacts
Ivins	**Vulnerabilities:** Ivins is vulnerable because residents, parks, trails, tourism-related amenities, public facilities, and utility systems are exposed to intense desert heat, especially during summer recreation periods. Outdoor visitors, older adults, and workers without sufficient cooling, shade, or hydration are particularly sensitive to prolonged heat. **Impacts:** Extreme heat can increase dehydration and heat illness, reduce safe use of parks and trails, raise cooling and irrigation costs, and stress electric and water systems. Heat may also affect special events and tourism activity, damage landscaping, and contribute to wildfire risk and power system strain during peak demand. Critical facilities and infrastructure potentially impacted include Ivins City Hall and municipal facilities; Santa Clara-Ivins Police Department facilities serving Ivins; Ivins fire and emergency response facilities; schools and community facilities; senior centers, libraries, cooling centers, and public gathering spaces; public works, water, wastewater, stormwater, drainage, irrigation, storage, pumping, and distribution infrastructure; Old Highway 91, Center Street, local access routes, sidewalks, traffic-control devices, and emergency routes; electric and communications infrastructure; parks, trailheads, recreation facilities, public landscapes, desert-edge open spaces, residential cooling systems, fire protection water supplies, utility corridors, and tourism-related amenities vulnerable to heat exposure, increased cooling and irrigation demand, power system strain, vegetation stress, reduced outdoor recreation safety, and elevated wildfire risk.
La Verkin	**Vulnerabilities:** La Verkin is vulnerable because of its high summer temperatures, river-corridor setting, homes, schools, parks, businesses, and utility systems that rely on dependable cooling, power, and water during hot periods. Residents, outdoor workers, and visitors traveling through or recreating nearby are especially susceptible to heat stress. **Impacts:** Extreme heat can increase heat-related illness, strain utilities and public facilities, raise water and electricity demand, and reduce safe outdoor activity and worker productivity. Heat may also stress vegetation, increase wildfire potential, and affect tourism and travel comfort in this corridor community. Critical facilities and infrastructure potentially impacted include La Verkin City offices and municipal facilities; La Verkin Police Department; La Verkin fire and emergency response facilities; schools and community facilities; senior centers, cooling centers, libraries, and public buildings; public works, water, wastewater, stormwater, drainage, storage, pumping, and utility infrastructure; State Route 9, State Route 17, local roads, sidewalks, bridges, traffic-control devices, and Zion gateway access routes; electric and communications infrastructure; parks, trailheads, visitor-serving businesses, public landscapes, fire protection water supplies, utility corridors, and corridor travel infrastructure vulnerable to heat illness exposure, increased power and water demand, cooling system strain, pavement stress, vegetation decline, reduced outdoor activity safety, and wildfire potential.
Enterprise	**Vulnerabilities:** Enterprise is vulnerable where residents, schools, farms, ranch operations, local businesses, and utility systems are exposed to prolonged

Plan Participant	Vulnerabilities and Impacts
	heat in a rural community with significant agricultural activity and outdoor labor. Livestock, crops, irrigation needs, and workers in construction and agriculture are especially sensitive to sustained high temperatures. **Impacts:** Extreme heat can increase heat illness risk, reduce livestock productivity and crop performance, raise irrigation and cooling demand, and increase operating costs for agriculture and local businesses. Heat may also stress local power and water systems, reduce worker productivity, increase wildfire danger, and create longer-term recovery challenges where local resources are limited. Critical facilities and infrastructure potentially impacted include Enterprise City offices and municipal facilities; Enterprise Police Department; Enterprise fire and emergency response facilities; schools and community facilities; senior centers, cooling centers, and public buildings; municipal and domestic water systems, wells, storage tanks, pumping and distribution infrastructure; wastewater, drainage, irrigation, and agricultural water infrastructure; State Route 18, local roads, sidewalks, bridges, traffic-control devices, and rural access routes; electric and communications infrastructure; farms, ranches, livestock water supplies, barns, corrals, fields, irrigation equipment, parks, public landscapes, fire protection water supplies, maintenance yards, and agricultural support facilities vulnerable to heat stress, livestock and crop impacts, increased irrigation and cooling demand, power system strain, worker exposure, wildfire danger, and delayed emergency response during prolonged heat events.
Toquerville	**Vulnerabilities:** Toquerville is vulnerable where residential areas are growing, parks, roads, utility systems, and outdoor community spaces are exposed to prolonged summer heat in an arid environment. Outdoor workers, residents without reliable cooling, and people engaged in recreation or travel are particularly susceptible during extended hot periods. **Impacts:** Extreme heat can increase health risks, raise demand for power and water, stress vegetation and public landscapes, and increase costs for cooling and facility operations. It may also reduce outdoor activity, affect construction and maintenance work, elevate wildfire risk, and create added strain on local services during prolonged heat waves. Critical facilities and infrastructure potentially impacted include Toquerville Town Hall and municipal facilities; Toquerville fire and emergency response facilities; public works and utility facilities; schools and community facilities serving the area; senior centers, cooling centers, and public gathering spaces; culinary water, irrigation, wastewater, stormwater, drainage, storage, pumping, and distribution infrastructure; State Route 17, Interstate 15 access routes, local roads, sidewalks, bridges, traffic-control devices, and evacuation routes; electric and communications infrastructure; parks, trails, public landscapes, residential cooling systems, fire protection water supplies, nearby agricultural and open-space irrigation systems, public buildings, and visitor-serving facilities vulnerable to prolonged heat, increased power and water demand, cooling system strain, vegetation stress, pavement stress, outdoor worker exposure, and wildfire risk.

Plan Participant	Vulnerabilities and Impacts
Leeds	**Vulnerabilities:** Leeds is vulnerable where residents, community facilities, roads, utility systems, and travelers using the Interstate 15 corridor are exposed to prolonged high temperatures with limited local infrastructure redundancy. Outdoor workers, travelers, and residents without adequate cooling can be affected during heat events. **Impacts:** Extreme heat can increase heat-related illness, raise electricity and water demand, stress public facilities and landscaping, and affect travel safety and comfort along local and interstate routes. It may also reduce outdoor labor productivity, increase wildfire danger, and create maintenance issues for roads and other infrastructure. Critical facilities and infrastructure potentially impacted include Leeds Town Hall and public works facilities; Leeds fire and emergency response facilities; community facilities, cooling centers, and public buildings; water, wastewater, stormwater, drainage, storage, pumping, and utility infrastructure; Interstate 15, Main Street, local roads, sidewalks, bridges, traffic-control devices, and access routes; electric and communications infrastructure; parks, public landscapes, fire protection water supplies, roadside vegetation, open-space areas, public buildings, and corridor-related travel infrastructure vulnerable to heat exposure, increased power and water demand, cooling system strain, pavement and roadway stress, wildfire danger, outdoor worker exposure, and disruption of emergency access and regional travel during prolonged heat events.
Virgin	**Vulnerabilities:** Virgin is vulnerable because residents, lodging, restaurants, visitor-serving businesses, parks, and utility systems are exposed to high summer temperatures in the Zion gateway corridor. Visitors unfamiliar with desert heat, outdoor recreation users, and workers in tourism-related businesses are especially vulnerable when temperatures remain very high and overnight relief is limited. **Impacts:** Extreme heat can increase dehydration, heat exhaustion, and emergency medical incidents; strain power and water systems; and reduce safe use of outdoor spaces and trail access. Economic impacts may also include disruption to visitor activity, higher operating costs for local businesses, stressed landscaping, and elevated wildfire risk. Critical facilities and infrastructure potentially impacted include Virgin Town Hall and municipal facilities; Virgin fire and emergency response facilities; public works, water, wastewater, drainage, storage, pumping, and utility infrastructure; cooling centers and public gathering spaces; State Route 9, local roads, sidewalks, bridges, traffic-control devices, and Zion gateway access routes; electric and communications infrastructure; lodging, restaurants, visitor-serving businesses, parks, trailheads, campgrounds, public landscapes, fire protection water supplies, utility corridors, and recreation assets vulnerable to heat illness exposure, increased cooling and water demand, power system strain, reduced outdoor recreation safety, vegetation stress, wildfire potential, and interrupted access for residents and visitors.
Springdale	**Vulnerabilities:** Springdale is highly vulnerable because residents, hotels, restaurants, employee housing, visitor facilities, parks, and utilities are

Plan Participant	Vulnerabilities and Impacts
	concentrated in the Zion gateway corridor where summer temperatures are very high and visitor volumes peak during warm months. Tourists, outdoor workers, and people recreating in canyon environments are especially susceptible to heat illness, particularly where access to shade, water, and quick medical response is limited. **Impacts:** Extreme heat can cause dehydration, heat exhaustion, heat stroke, and fatalities; disrupt tourism and outdoor recreation; strain local medical response, utilities, and water use; and raise costs for cooling and public operations. Even short-duration heat events can create outsized safety and economic impacts because of high visitor numbers, constrained transportation access, and the town's reliance on outdoor tourism. Critical facilities and infrastructure potentially impacted include Springdale Town Hall and municipal facilities; Springdale Police Department and emergency response facilities; public works, water, wastewater, drainage, stormwater, storage, pumping, and utility infrastructure; cooling centers, employee housing, public gathering spaces, and health-related visitor support facilities; State Route 9, Zion Canyon access routes, shuttle-related transportation facilities, sidewalks, bridges, traffic-control devices, and local access routes; electric and communications infrastructure; hotels, restaurants, lodging areas, visitor facilities, parks, trailheads, public landscapes, fire protection water supplies, utility corridors, and Zion gateway recreation assets vulnerable to heat illness exposure, increased cooling and water demand, power system strain, limited shade and hydration access, reduced outdoor recreation safety, visitor service disruption, vegetation stress, and wildfire risk in the canyon corridor.
New Harmony	**Vulnerabilities:** New Harmony is vulnerable where homes, roads, water systems, agricultural lands, and community facilities are exposed to prolonged summer heat in a rural mountain-valley setting. Outdoor workers, older residents, and those dependent on limited local water and cooling resources can be especially affected during extended heat events. **Impacts:** Extreme heat can increase heat illness risk, stress local water and power demand, affect agricultural lands and vegetation, and raise costs for maintaining public spaces and community services. It may also reduce worker productivity, increase wildfire danger, and create challenges for emergency response in a small community with limited staffing and resources. Critical facilities and infrastructure potentially impacted include New Harmony Town Hall and municipal facilities; fire and emergency response facilities; public works, local and domestic water systems, wells, storage, pumping, wastewater, drainage, and utility infrastructure; community facilities, cooling centers, and public buildings; Interstate 15, State Route 144, local roads, sidewalks, bridges, traffic-control devices, and rural access routes; electric and communications infrastructure; agricultural and open lands, irrigation systems, livestock water supplies, parks, public landscapes, rural access roads, fire protection water supplies, and utility corridors vulnerable to heat stress, increased water and power demand, worker and livestock exposure,

Plan Participant	Vulnerabilities and Impacts
	vegetation and forage stress, wildfire danger, road and pavement stress, and delayed emergency response during prolonged heat.
Rockville	**Vulnerabilities:** Rockville is vulnerable because residents, historic resources, visitor-serving spaces, and local utilities in the Virgin River corridor are exposed to prolonged high temperatures in a small gateway community with limited infrastructure and heavy seasonal visitation. Older adults, visitors, and people recreating outdoors are particularly susceptible to heat stress. **Impacts:** Extreme heat can increase heat-related illness, stress water and electric systems, affect the condition of historic and landscaped resources, and reduce safe use of outdoor spaces. Heat may also disrupt visitor activity, increase cooling and maintenance costs, elevate wildfire danger, and strain local response capacity during medical or infrastructure incidents. Critical facilities and infrastructure potentially impacted include Rockville Town Hall and municipal facilities; fire and emergency response facilities; public works, water, wastewater, drainage, storage, pumping, and utility infrastructure; cooling centers and public gathering spaces; State Route 9, local roads, sidewalks, bridges, traffic-control devices, and Zion gateway access routes; electric and communications infrastructure; historic buildings, homes, parks, public spaces, visitor-serving facilities, Virgin River corridor vegetation, public landscapes, fire protection water supplies, utility corridors, and scenic or historic community resources vulnerable to heat exposure, increased cooling and water demand, power strain, vegetation stress, reduced outdoor activity safety, wildfire risk, and disrupted emergency access in a constrained gateway corridor.
Apple Valley	**Vulnerabilities:** Apple Valley is vulnerable where dispersed residential development, local roads, water systems, and community facilities are exposed to prolonged heat in a rural-desert setting. Residents without reliable cooling, outdoor workers, and people living farther from services may be more vulnerable during extended heat waves. **Impacts:** Extreme heat can increase health risks, strain local water and electric demand, stress vegetation and open-space resources, and raise costs for cooling and system maintenance. It may also affect travel safety, reduce outdoor labor productivity, elevate wildfire danger, and create service challenges where response capacity is limited. Critical facilities and infrastructure potentially impacted include Apple Valley Town Hall and municipal facilities; fire and emergency response facilities; public works, community water systems, wells, storage, pumping, wastewater, drainage, and utility infrastructure; cooling centers and public gathering spaces; State Route 59, local roads, sidewalks, bridges, washes, traffic-control devices, and rural access routes; electric and communications infrastructure; parks, community facilities, dispersed residential cooling and water systems, fire protection water supplies, utility corridors, open-space resources, and limited agricultural or livestock water infrastructure vulnerable to prolonged heat, increased power and water demand, heat exposure for residents and outdoor workers,

Plan Participant	Vulnerabilities and Impacts
	vegetation stress, dust, wildfire risk, roadway stress, and service challenges across dispersed neighborhoods.
Hildale	**Vulnerabilities:** Hildale is vulnerable where homes, schools, public facilities, utility and water systems, and surrounding open areas are exposed to prolonged heat in a rugged desert setting. Residents with limited cooling options, older adults, outdoor workers, and people dependent on community water and power systems are especially susceptible to heat stress. **Impacts:** Extreme heat can increase dehydration and heat illness, strain water and power systems, stress public facilities and vegetation, and raise operating costs for cooling and infrastructure management. It may also reduce outdoor work and recreation safety, increase wildfire danger, and create additional pressure on a community with ongoing infrastructure and service needs. Critical facilities and infrastructure potentially impacted include Hildale City Hall and municipal facilities; Hildale Police Department; Hildale fire and emergency response facilities; Water Canyon School and other community facilities; public works, culinary water, wastewater, stormwater, drainage, storage, pumping, and utility infrastructure; cooling centers, public buildings, and community gathering spaces; Utah State Route 59, local roads, sidewalks, bridges, culverts, washes, traffic-control devices, and community access routes; electric and communications infrastructure; parks, public landscapes, residential cooling and water systems, fire protection water supplies, utility corridors, and structures in rugged or drainage-sensitive areas vulnerable to heat exposure, increased cooling and water demand, power and water service strain, vegetation stress, wildfire danger, roadway stress, and isolation or delayed emergency response.

Flooding

Table 166 summarizes flooding vulnerabilities and potential impacts for Washington County participants.

Table 166: Flooding Vulnerability and Impact Assessment for Washington County

Plan Participant	Vulnerabilities and Impacts
Washington County	**Vulnerabilities:** Washington County is vulnerable to flooding because the Virgin River, Santa Clara River, Fort Pearce Wash, and numerous other wash and drainage networks intersect the county's primary population centers, transportation corridors, public facilities, utilities, agricultural lands, and recreation areas. NOAA/NCEI records list multiple flood and flash flood events in the county between 2022 and 2025. Vulnerable assets include homes and businesses in river corridors and alluvial settings, bridges and roads, stormwater and drainage systems, schools, public safety facilities, parks, and

Plan Participant	Vulnerabilities and Impacts
	county-supported infrastructure exposed to riverine flooding, flash flooding, and post-wildfire debris-laden runoff.[258] **Impacts:** Flooding can cause injuries or fatalities, inundate homes and businesses, erode channels and embankments, wash out roads and bridges, damage utilities and public facilities, and isolate communities or recreation areas. Countywide impacts may also include debris and sediment deposition, stormwater system failures, interruption of emergency response and regional travel, damage to agricultural lands and tourism assets, and high recovery costs for critical infrastructure and public services. Critical facilities and infrastructure potentially impacted include Washington County Sheriff's Office; Washington County Emergency Management; St. George 911 Communications Center; Southwest Utah Public Health Department; St. George Regional Hospital; Washington County School District facilities; county and municipal government buildings; public safety facilities; public works yards; Interstate 15, State Route 9, State Route 7, State Route 18, and other regional roadways, bridges, culverts, low-water crossings, and evacuation routes; Virgin River, Santa Clara River, Fort Pearce Wash, Ash Creek, La Verkin Creek, Beaver Dam Wash, and other wash and drainage corridor infrastructure; Washington County Water Conservancy District reservoirs, pipelines, pump stations, water storage, and distribution infrastructure; municipal water, wastewater, stormwater, drainage, flood-control, power, communications, and utility systems; parks, trailheads, campgrounds, agricultural lands, irrigation infrastructure, recreation areas, visitor-serving facilities, and public buildings vulnerable to inundation, erosion, debris, sediment deposition, washouts, utility interruption, and access disruption.
St. George	**Vulnerabilities:** St. George is highly vulnerable because major flood sources, including the Virgin River system, the Santa Clara River, Fort Pearce Wash, and local storm drainage corridors, intersect dense residential and commercial development, major arterials, utilities, public facilities, and airport-related infrastructure. Low-lying developed areas, stormwater systems, bridges, and roads are especially susceptible to riverine flooding, flash flooding, channel erosion, and debris-laden runoff during large storms or rain-on-snow events. The January 2005 flood damaged homes, roads, utilities, and agricultural lands in and around St. George. **Impacts:** Flooding can threaten life safety, damage homes, businesses, roads, bridges, storm drainage systems, utilities, and public facilities, and disrupt emergency response, hospital access, airport operations, and regional commerce. High-velocity floodwaters and sediment can also erode channels, overwhelm drainage infrastructure, interrupt travel and services, and create costly long-term recovery needs in this regional urban center. Critical facilities and infrastructure potentially impacted include St. George City Hall and

[258] NOAA = National Oceanic and Atmospheric Administration; NCEI = National Centers for Environmental Information

Plan Participant	Vulnerabilities and Impacts
	municipal government facilities; St. George Police Department; St. George Fire Department stations (Fire Station #10 at 3270 E Flowers Way); St. George 911 Communications Center; St. George Regional Hospital at 1380 S Medical Center Dr; Utah Tech University facilities; Washington County School District schools and support facilities; St. George Regional Airport; public works, water, wastewater, stormwater, and drainage facilities; bridges, culverts, and road crossings along the Virgin River, Santa Clara River, Fort Pearce Wash, and local drainage corridors; Interstate 15, State Route 7, Bluff Street, River Road, St. George Boulevard, Riverside Drive, and other major arterials; Washington County Water Conservancy District facilities serving the St. George area; electric substations, power, communications, fiber, cellular infrastructure, parks, trail systems, golf courses, recreation facilities, commercial centers, hotels, medical offices, public buildings, and visitor-serving infrastructure vulnerable to flooding, erosion, debris, sediment, utility outages, airport access disruption, and emergency response delays.
Washington City	**Vulnerabilities:** Washington City is vulnerable because growing neighborhoods, schools, parks, roads, utilities, and drainage infrastructure are exposed to flooding from river corridors, washes, alluvial drainageways, and localized stormwater exceedance. Continued growth increases the number of structures, roads, and public facilities potentially affected by flash flooding, channel erosion, and sediment-laden runoff during intense storms. **Impacts:** Flooding impacts could include injuries, damage to homes and community facilities, road and bridge closures, erosion of drainage channels, utility interruptions, and disruption of schools, city operations, and neighborhood access. Stormwater system overload, debris deposition, and washed out roads may also create costly repair needs and delay emergency response and daily travel. Critical facilities and infrastructure potentially impacted include Washington City offices and municipal facilities; Washington City Police Department; Washington City Fire Department facilities; Washington County School District schools and community facilities; public works facilities; culinary water, irrigation, wastewater, stormwater, drainage, and flood-control infrastructure; bridges, culverts, and road crossings along the Virgin River, Mill Creek, and local washes; Interstate 15, State Route 9, Telegraph Street, Green Spring Drive, Washington Parkway, and major local access routes; Washington County Water Conservancy District facilities serving the Washington area; power, communications, fiber, cellular, and utility infrastructure; parks, sports fields, trail systems, commercial centers, public buildings, and neighborhoods vulnerable to inundation, street flooding, channel erosion, sediment deposition, utility disruption, and interrupted emergency access.
Hurricane	**Vulnerabilities:** Hurricane is highly vulnerable because development near the Virgin River system, washes, roads, bridges, utility corridors, and neighborhoods in the Hurricane Valley can be affected by both riverine flooding and fast-moving flash floods. Growing residential and commercial areas, schools, parks, and transportation links increase exposure to flooding,

Plan Participant	Vulnerabilities and Impacts
	sediment deposition, culvert overtopping, and drainage failures during intense rainfall or runoff events. **Impacts:** Potential impacts include injuries, property damage, washed out roads and crossings, utility disruptions, erosion of channels and embankments, and interruption of emergency access, schools, and business activity. Flooding may also damage stormwater infrastructure, affect recreation travel, and require costly cleanup and repair of sediment- and debris-impacted public facilities and transportation routes. Critical facilities and infrastructure potentially impacted include Hurricane City Hall and municipal facilities; Hurricane Police Department; Hurricane Valley Fire District facilities (Fire Station #42 at 445 N 3400 W); Washington County School District schools and community facilities; public works, water, wastewater, stormwater, drainage, irrigation, storage, pumping, and distribution infrastructure; Ash Creek, Gould Wash, Virgin River, and local wash corridor bridges, culverts, low-water crossings, and drainage channels; State Route 9, State Route 7, State Route 59, Interstate 15 access routes, evacuation corridors, and major local roads; Sand Hollow Reservoir and Quail Creek Reservoir recreation-support, access, dam, spillway, and utility infrastructure; power, communications, fiber, cellular, and utility corridors; parks, trailheads, campgrounds, marinas, commercial areas, tourism businesses, and public facilities vulnerable to flash flooding, debris flows, sediment deposition, culvert overtopping, erosion, washouts, utility interruption, and access disruption.
Santa Clara	**Vulnerabilities:** Santa Clara is highly vulnerable because of its direct exposure to the Santa Clara River corridor, nearby washes, bridges, roads, utilities, and developed areas with known flood history. Homes, businesses, community facilities, and local streets near flood conveyance areas remain sensitive to riverine flooding, flash flooding, erosion, and debris-laden flows, as shown by past damaging flood events in and around the city. **Impacts:** Flooding can cause severe damage to homes, businesses, public facilities, roads, bridges, stormwater infrastructure, and utility systems, with possible injuries, evacuations, and long-term recovery needs. High flows may also erode channels, undermine developed areas, deposit sediment and debris, interrupt transportation and daily services, and create substantial repair and mitigation costs. Critical facilities and infrastructure potentially impacted include Santa Clara City Hall and municipal facilities; Santa Clara-Ivins Police Department facilities; Santa Clara fire and emergency response facilities; Washington County School District schools and community facilities; public works, water, irrigation, wastewater, stormwater, drainage, and flood-control systems; Santa Clara River corridor bridges, culverts, bank protection, storm drain outfalls, and local road crossings; Old Highway 91, Santa Clara Drive, Pioneer Parkway, and other primary access routes; power, communications, fiber, cellular, and utility infrastructure; parks, trails, recreation areas, public buildings, commercial areas, neighborhoods, and community facilities vulnerable to riverine flooding, flash flooding, bank

Plan Participant	Vulnerabilities and Impacts
	erosion, sediment deposition, debris impacts, stormwater overload, utility disruption, and evacuation or emergency access constraints.
Ivins	**Vulnerabilities:** Ivins is vulnerable where homes, roads, parks, public facilities, drainage channels, and utility systems are located near washes, desert drainageways, and slope transition areas that can convey fast runoff during intense storms. Urbanizing areas, limited transportation connections, and local drainage constraints increase sensitivity to flash flooding, street flooding, and sediment movement. **Impacts:** Flooding can damage homes, roads, culverts, parks, drainage infrastructure, and utilities; isolate neighborhoods; and disrupt emergency response, travel, and public services. High-intensity runoff may also erode channels, deposit sediment and debris, affect recreation access, and create expensive repair and maintenance needs for local infrastructure. Critical facilities and infrastructure potentially impacted include Ivins City Hall and municipal facilities; Santa Clara-Ivins Police Department facilities serving Ivins; Ivins fire and emergency response facilities; Washington County School District schools and community facilities; public works, water, wastewater, stormwater, drainage, irrigation, storage, pumping, and distribution infrastructure; local washes, desert drainageways, culverts, low-water crossings, and drainage channels connected to the Santa Clara River watershed; Old Highway 91, Center Street, Snow Canyon Parkway, local access routes, bridges, and emergency routes; power, communications, fiber, cellular, and utility infrastructure; parks, trailheads, recreation facilities, public buildings, tourism-related amenities, and neighborhoods vulnerable to flash flooding, street flooding, sediment movement, erosion, culvert overtopping, utility interruption, and temporary isolation.
La Verkin	**Vulnerabilities:** La Verkin is highly vulnerable because of its location near the Virgin River system, steep terrain, bridges, roads, utilities, and developed areas exposed to riverine flooding and flash flooding in drainage corridors. Confined channels, riverbanks, and transportation links can be affected by high-velocity water, sediment, and erosion during intense storms, snowmelt events, or runoff from upstream basins. **Impacts:** Flooding impacts could include injuries, washed out roads and crossings, damage to homes and utilities, bank erosion, disruption of SR-9 and local travel, and interruption of emergency access to nearby communities. Sediment and debris may also damage drainage infrastructure and increase recovery costs for public works, utilities, and river-adjacent development. Critical facilities and infrastructure potentially impacted include La Verkin City offices and municipal facilities; La Verkin Police Department; La Verkin fire and emergency response facilities; Washington County School District schools and community facilities; public works, water, wastewater, stormwater, drainage, storage, pumping, and utility infrastructure; La Verkin Creek, Ash Creek, Virgin River, and local drainage corridor bridges, culverts, low-water crossings, and channel infrastructure; State Route 9, State Route 17, local bridges, evacuation routes, and Zion gateway access routes; power, communications, fiber,

Plan Participant	Vulnerabilities and Impacts
	cellular, and utility infrastructure; parks, trailheads, visitor-serving businesses, public buildings, and river- or wash-adjacent facilities vulnerable to riverine flooding, flash flooding, erosion, debris, sediment deposition, utility outages, road washouts, and access disruption.
Enterprise	**Vulnerabilities:** Enterprise is vulnerable where local roads, culverts, agricultural lands, homes, schools, utility systems, and dispersed development are located near washes, low-water crossings, and drainageways that can flood during intense storms or runoff events. Rural land use patterns, limited alternate routes, and dependence on smaller local systems increase sensitivity to localized flooding, erosion, and stormwater damage. **Impacts:** Potential impacts include flooding of homes and agricultural areas, road washouts, culvert failure, erosion, utility disruption, and interruption of school, business, and emergency access. Recovery may be prolonged where local staffing and funding are limited and where sediment and infrastructure damage require outside technical or financial assistance. Critical facilities and infrastructure potentially impacted include Enterprise City offices and municipal facilities; Enterprise Police Department; Enterprise fire and emergency response facilities; Washington County School District schools and community facilities; public works, municipal and domestic water systems, wastewater, drainage, stormwater, irrigation, storage, pumping, and agricultural water infrastructure; State Route 18, local roads, bridges, culverts, low-water crossings, drainage channels, and rural access routes; reservoirs, irrigation systems, canals, storage ponds, farms, ranches, barns, corrals, fields, and agricultural support facilities; power, communications, fiber, cellular, and utility infrastructure; parks, public buildings, and maintenance yards vulnerable to localized flooding, erosion, sediment deposition, culvert failure, road washouts, irrigation infrastructure damage, utility disruption, and delayed emergency access.
Toquerville	**Vulnerabilities:** Toquerville is highly vulnerable because homes, roads, drainage crossings, utilities, and expanding residential areas are located near washes and drainage corridors with documented recent flooding. Its terrain, canyon-influenced runoff patterns, and growing development increase exposure to localized flash flooding, culvert overtopping, erosion, and debris-laden flows during heavy rain or runoff events. **Impacts:** Flooding can cause injuries, property damage, road and bridge closures, stormwater and utility disruption, and erosion affecting channels and developed areas. The town may also face neighborhood isolation, interruption of emergency response, costly roadway and drainage repairs, and recurring cleanup needs where sediment and debris accumulate. Critical facilities and infrastructure potentially impacted include Toquerville Town Hall and municipal facilities; Toquerville fire and emergency response facilities; public works and utility facilities; Washington County School District schools and community facilities serving the area; culinary water, irrigation, wastewater, stormwater, drainage, storage, pumping, and distribution infrastructure; Ash Creek, La Verkin Creek watershed drainages, local washes, culverts, low-water

Plan Participant	Vulnerabilities and Impacts
	crossings, and channel infrastructure; State Route 17, Interstate 15 access routes, local roads, bridges, evacuation routes, and developing neighborhood access roads; power, communications, fiber, cellular, and utility infrastructure; parks, trails, public buildings, visitor-serving facilities, and neighborhoods vulnerable to flash flooding, debris-laden flows, culvert overtopping, erosion, sediment deposition, utility interruption, neighborhood isolation, and emergency access disruption.
Leeds	**Vulnerabilities:** Leeds is vulnerable where homes, Interstate 15 access points, local roads, drainage channels, bridges, and utility systems are located near washes, steep slopes, and alluvial drainage features that can convey sudden runoff. The town's terrain, transportation dependence, and limited roadway connections increase sensitivity to flash flooding, debris, erosion, and wash-related travel disruption. **Impacts:** Potential impacts include flood damage to residences and infrastructure, culvert and channel failure, road closures affecting local and interstate access, utility outages, and disruption of emergency response and commuter travel. Flooding may also produce sediment and debris impacts that create broader regional transportation consequences and increase public works repair costs. Critical facilities and infrastructure potentially impacted include Leeds Town Hall and public works facilities; Leeds fire and emergency response facilities; water, wastewater, stormwater, drainage, storage, pumping, and utility infrastructure; Leeds Creek, Quail Creek, local washes, culverts, low-water crossings, and drainage channels; Interstate 15, Main Street, local roads, bridges, access ramps, evacuation routes, and corridor transportation infrastructure; power, communications, fiber, cellular, and utility infrastructure; parks, public buildings, community facilities, and corridor-related infrastructure vulnerable to flash flooding, debris, sediment deposition, culvert failure, road washouts, utility outages, interstate access disruption, and delayed emergency response.
Virgin	**Vulnerabilities:** Virgin is highly vulnerable because of its location in the Zion gateway corridor along the Virgin River system, proximity to flash flood channels, and reliance on limited transportation and utility infrastructure serving both residents and visitors. Homes, businesses, roads, bridges, and visitor-oriented facilities in low-lying or drainage-adjacent areas are especially susceptible to riverine flooding, flash flooding, bank erosion, and debris impacts. **Impacts:** Flooding can threaten life safety, damage tourism-related businesses, residences, roads, bridges, and utilities, and disrupt SR-9 access, evacuation, and emergency response. Economic impacts may also extend beyond physical damage through lost visitor activity, interrupted local commerce, sediment cleanup, and prolonged repair of transportation and infrastructure systems. Critical facilities and infrastructure potentially impacted include Virgin Town Hall and municipal facilities; Virgin fire and emergency response facilities; public works, water, wastewater, drainage, storage, pumping, and utility infrastructure; Virgin River corridor bridges, culverts, low-

Plan Participant	Vulnerabilities and Impacts
	water crossings, and local drainage channels; State Route 9, local roads, evacuation routes, and Zion gateway access routes; power, communications, fiber, cellular, and utility corridors; lodging, restaurants, visitor-serving businesses, parks, trailheads, campgrounds, recreation access points, public landscapes, and public buildings vulnerable to riverine flooding, flash flooding, bank erosion, debris, sediment deposition, utility interruption, SR-9 access disruption, and emergency response delays.
Springdale	**Vulnerabilities:** Springdale is highly vulnerable because development is concentrated along the Virgin River corridor in a narrow canyon setting with steep slopes, limited transportation access, and high visitor volumes tied to Zion National Park. Homes, hotels, businesses, roads, bridges, utilities, and public facilities are exposed to riverine flooding, flash flooding, bank erosion, and debris-laden flows, as shown by repeated flood impacts in the community and the broader Zion corridor. **Impacts:** Potential impacts include life safety threats, damage to lodging, businesses, homes, roads, bridges, utilities, and public facilities, and severe disruption to tourism, evacuation, and emergency access in the Zion gateway area. Because transportation options are limited, even moderate flooding can create outsized economic losses, prolonged service interruptions, and significant recovery demands. Critical facilities and infrastructure potentially impacted include Springdale Town Hall and municipal facilities; Springdale Police Department and emergency response facilities; public works, water, wastewater, stormwater, drainage, storage, pumping, and utility infrastructure; Virgin River corridor bridges, culverts, low-water crossings, bank protection, and drainage channels; State Route 9, Zion Canyon access routes, shuttle-related transportation facilities, local roads, evacuation routes, and visitor access corridors; power, communications, fiber, cellular, and utility infrastructure; hotels, restaurants, lodging areas, employee housing, visitor facilities, parks, trailheads, public buildings, Zion gateway recreation assets, and public gathering areas vulnerable to riverine flooding, flash flooding, bank erosion, debris-laden flows, sediment deposition, utility outages, tourism disruption, evacuation constraints, and emergency access disruption.
New Harmony	**Vulnerabilities:** New Harmony is vulnerable where local roads, bridges, drainage channels, water infrastructure, homes, and agricultural or open land areas can be affected by runoff from mountain-valley drainage systems and localized flash flooding. Its rural setting, steep surrounding terrain, winter runoff influences, and limited access routes increase sensitivity to washouts, culvert failure, and isolation during flood events. **Impacts:** Flooding can damage homes and roads, erode channels and embankments, affect water and utility systems, interrupt emergency response and school or commuter access, and create economic losses tied to infrastructure repair. Recovery may be slower where staffing, equipment, and financial resources are limited and road or drainage repairs require outside assistance. Critical facilities and infrastructure potentially impacted include New Harmony Town Hall and municipal facilities; fire and emergency

Plan Participant	Vulnerabilities and Impacts
	response facilities; public works, local and domestic water systems, wells, storage, pumping, wastewater, drainage, and utility infrastructure; Ash Creek watershed drainage crossings, local washes, culverts, low-water crossings, and rural drainage channels; Interstate 15, State Route 144, local roads, bridges, evacuation routes, and rural access roads; power, communications, fiber, cellular, and utility corridors; agricultural and open lands, irrigation systems, livestock water supplies, parks, community facilities, public buildings, and public landscapes vulnerable to flash flooding, runoff, culvert failure, road washouts, sediment deposition, erosion, utility interruption, and isolation or delayed emergency response.
Rockville	**Vulnerabilities:** Rockville is especially vulnerable because of its location directly along the Virgin River corridor, small historic and residential development pattern, constrained evacuation routes, and repeated recent flood impacts. Homes, historic resources, roads, bridges, utilities, and public spaces in low-lying or river-adjacent areas are susceptible to riverine flooding, flash flooding, bank erosion, and debris-laden flows moving through the narrow Zion corridor. **Impacts:** Potential impacts include life safety threats, structural damage to homes and historic resources, road and bridge damage, utility outages, erosion, and disruption of access for residents and visitors. Because the community is small and access is limited, even localized flooding can significantly affect evacuation, emergency response, tourism activity, and long-term recovery operations. Critical facilities and infrastructure potentially impacted include Rockville Town Hall and municipal facilities; fire and emergency response facilities; public works, water, wastewater, drainage, storage, pumping, and utility infrastructure; Virgin River corridor bridges, culverts, low-water crossings, bank protection, and drainage channels; State Route 9, local roads, evacuation routes, and Zion gateway access routes; power, communications, fiber, cellular, and utility infrastructure; historic buildings, homes, parks, trailheads, visitor-serving facilities, public buildings, public spaces, and scenic or historic community resources vulnerable to riverine flooding, flash flooding, bank erosion, debris, sediment deposition, utility outages, road or bridge damage, constrained evacuation, and disrupted emergency access.
Apple Valley	**Vulnerabilities:** Apple Valley is vulnerable where dispersed residential development, local roads, drainage crossings, utilities, and water infrastructure are exposed to localized flooding in washes and drainage-sensitive areas. The community's rural-residential layout, limited alternate access, and modest infrastructure systems increase sensitivity to flash flooding, erosion, culvert overtopping, and service disruption during intense storms. **Impacts:** Flooding can damage homes, roads, culverts, and utility systems; cause erosion and debris deposition in drainageways; and interrupt emergency response, school travel, and access to essential services. Recovery could be challenging if multiple dispersed neighborhoods are affected at

Plan Participant	Vulnerabilities and Impacts
	once or if repairs to roads and drainage infrastructure require outside support. Critical facilities and infrastructure potentially impacted include Apple Valley Town Hall and municipal facilities; fire and emergency response facilities; public works, community water systems, wells, storage, pumping, wastewater, drainage, and utility infrastructure; State Route 59, local roads, bridges, culverts, washes, low-water crossings, evacuation routes, and rural access roads; power, communications, fiber, cellular, and utility corridors; parks, community facilities, dispersed residential water systems, public buildings, open-space resources, limited agricultural or livestock water infrastructure, and maintenance facilities vulnerable to flash flooding, washout, erosion, debris, sediment deposition, culvert overtopping, utility disruption, delayed emergency access, and service challenges across dispersed neighborhoods.
Hildale	**Vulnerabilities:** Hildale is highly vulnerable because homes, roads, drainage infrastructure, utility and water systems, and public facilities are located in rugged terrain and drainage-sensitive areas with a history of dangerous flash flooding. Washes, low-water crossings, and transportation links can be overwhelmed by sudden high-intensity rainfall, increasing exposure to fast-moving water, debris, erosion, and isolation. **Impacts:** Potential impacts include life safety threats, damage to homes and infrastructure, washed out roads and crossings, utility and water service interruption, erosion, and disruption of emergency response and public safety operations. In a community with significant infrastructure needs, flood recovery may require outside technical and financial assistance and could be complicated by limited alternate access and service capacity. Critical facilities and infrastructure potentially impacted include Hildale City Hall and municipal facilities; Hildale Police Department; Hildale Fire (Hildale/Colorado City Fire Station at 40 S Pioneer St) and emergency response facilities; Water Canyon School and other community facilities; public works, culinary water, wastewater, stormwater, drainage, storage, pumping, and utility infrastructure; Utah State Route 59, local roads, bridges, culverts, washes, low-water crossings, community access routes, and evacuation routes; power, communications, fiber, cellular, and utility corridors; parks, public buildings, residential water systems, public landscapes, drainage-sensitive open areas, and structures in rugged terrain vulnerable to flash flooding, debris flows, washouts, erosion, sediment deposition, utility and water service interruption, isolation, and delayed emergency response.

Hail

Table 167 summarizes hail vulnerabilities and potential impacts for Washington County participants.

Table 167: Hail Vulnerability and Impact Assessment for Washington County

Plan Participant	Vulnerabilities and Impacts
Washington County	**Vulnerabilities:** Washington County is vulnerable to hail because it combines repeated hail occurrence with the largest concentration of population, housing, commercial development, public facilities, transportation assets, visitor-serving businesses, and agricultural operations in the planning area. The NCEI hail selection contains 4 records on 4 dates in Washington County during 2021–2025, filtered to reported diameters of at least 1 inch, with $7,500 in reported property damage. Modeled hail-footprint estimates do not establish the number of damaged homes. Vulnerable assets include homes, roofs, windows, vehicles, schools, health care and public safety facilities, utilities, parks, solar and HVAC equipment, airport-related assets, and agricultural lands and equipment in outlying areas.[259][260] **Impacts:** Hail can damage roofs, siding, windows, skylights, solar arrays, vehicles, aircraft, crops, and outdoor equipment; create hazardous travel conditions; and interrupt transportation, airport operations, health care, education, tourism, and public services. Countywide impacts may also include repeated maintenance and replacement costs, business interruption, strain on public-sector repair budgets, and indirect economic losses tied to visitor activity, agriculture, and service disruption. Recent reports include 1.00-inch hail near Washington on August 22, 2022, 1.00-inch hail near Rockville on September 19, 2023, and St. George events up to 1.75 inches affecting more than 300 homes. Critical facilities and infrastructure potentially impacted include Washington County Sheriff's Office; Washington County Emergency Management; St. George 911 Communications Center; Southwest Utah Public Health Department; St. George Regional Hospital; Washington County School District facilities; county and municipal government buildings; public safety facilities; public works facilities; Interstate 15, State Route 9, State Route 7, State Route 18, and other regional roadways, traffic signals, bridges, culverts, evacuation routes, fleet vehicles, and maintenance yards; St. George Regional Airport, aircraft, hangars, aviation support equipment, and airport operations facilities; electric substations, overhead and underground power systems, communications towers, cellular and internet infrastructure, water and wastewater facilities, stormwater and drainage systems, fuel supply points, solar arrays, HVAC systems, rooftops, skylights, windows, signage, parks, trailheads, campgrounds, reservoir recreation facilities, tourism and visitor-serving infrastructure, agricultural buildings, sheds, barns, fences, corrals,

[259] HVAC = heating, ventilation, and air conditioning

[260] NOAA National Centers for Environmental Information, Storm Events Database, annual details CSV files, retrieved October 10, 2026. https://www.ncei.noaa.gov/pub/data/swdi/stormevents/csvfiles/ Washington County, 2021–2025 hail, reported diameters at least 1 inch. Four records, four dates, $7,500 property damage.

Plan Participant	Vulnerabilities and Impacts
	irrigation equipment, crops, forage, livestock support facilities, and public buildings vulnerable to hail damage, broken glass, roof and siding damage, vehicle and aircraft damage, equipment failure, crop loss, hazardous travel conditions, service interruption, and increased repair and replacement costs.
St. George	**Vulnerabilities:** St. George is highly vulnerable because of its dense residential and commercial development, high property values, schools, medical facilities, utilities, airport-related assets, parks, vehicles, and rapidly growing neighborhoods exposed to recurring hail. Large areas of roofing, skylights, solar equipment, HVAC units, signage, and parked vehicles increase the city's sensitivity to even localized severe hail. Recent hail reports include 1.50-inch hail on September 13, 2023, 1.25-inch hail on October 18, 2024, and 1.75-inch hail on October 10, 2025. **Impacts:** Hail can damage homes, businesses, schools, hospitals, vehicles, solar installations, airport facilities, and outdoor equipment; create hazardous driving conditions; and interrupt commerce, tourism, and regional services centered in St. George. Repeated hail events can also shorten the useful life of exterior materials and equipment and generate substantial insurance claims, repair costs, and temporary service disruptions in this regional urban center. Recent St. George hail events were estimated to affect approximately 115 homes in 2023, 719 homes in 2024, and 314 homes in 2025. Critical facilities and infrastructure potentially impacted include St. George City Hall and municipal government facilities; St. George Police Department; St. George Fire Department stations; St. George 911 Communications Center; St. George Regional Hospital; Utah Tech University facilities; Washington County School District schools and support facilities; St. George Regional Airport, aircraft, hangars, aviation support equipment, runways, parking areas, and airport operations facilities; public works, water, wastewater, stormwater, and drainage facilities; Interstate 15, State Route 7, Bluff Street, River Road, St. George Boulevard, Riverside Drive, traffic signals, bridges, culverts, fleet vehicles, and major arterials; electric substations, power and communications infrastructure, solar arrays, HVAC units, rooftops, skylights, windows, signage, parks, sports fields, golf courses, trail systems, recreation facilities, commercial centers, medical offices, hotels, warehouses, public buildings, and visitor-serving infrastructure vulnerable to hail-related roof damage, broken windows, vehicle and aircraft damage, solar and HVAC damage, hazardous travel conditions, airport delays, business interruption, and increased maintenance and insurance costs.
Washington City	**Vulnerabilities:** Washington City is vulnerable where growing neighborhoods, schools, parks, commercial areas, utility systems, vehicles, and public facilities are exposed to localized hailstorms capable of damaging roofs, windows, siding, solar equipment, and outdoor assets. Continued growth increases the number of homes, businesses, and public facilities potentially affected by hail damage. **Impacts:** Hail impacts could include damage to homes and community facilities, broken windows and roof coverings, vehicle damage, temporary

Plan Participant	Vulnerabilities and Impacts
	disruption to schools and city operations, and increased maintenance and insurance costs. Local travel may also be affected during storms by reduced visibility and hazardous road conditions while cleanup and repairs are underway. Critical facilities and infrastructure potentially impacted include Washington City offices and municipal facilities; Washington City Police Department; Washington City Fire Department facilities; Washington County School District schools and community facilities; public works facilities; culinary water, irrigation, wastewater, stormwater, drainage, and flood-control infrastructure; Interstate 15, State Route 9, Telegraph Street, Green Spring Drive, Washington Parkway, traffic signals, local bridges, culverts, fleet vehicles, and major access routes; overhead and underground power and communications infrastructure; solar arrays, HVAC units, rooftops, skylights, windows, signage, parks, sports fields, trail systems, commercial centers, public buildings, utility equipment, and neighborhood facilities vulnerable to hail damage, broken glass, roof and siding damage, dented vehicles, equipment failure, hazardous travel conditions, temporary service disruption, and increased repair costs.
Hurricane	**Vulnerabilities:** Hurricane is vulnerable because homes, schools, businesses, roads, utilities, parks, vehicles, and outdoor recreation-related assets are exposed to spring and summer thunderstorms capable of producing damaging hail. Growing residential and commercial development increases the amount of roofing, siding, windows, signage, and outdoor equipment susceptible to hail damage. **Impacts:** Potential impacts include roof and window damage, dented vehicles, damage to landscaping and outdoor equipment, hazardous travel conditions, and temporary interruption of schools, businesses, and public services. Hail may also increase repair costs for public facilities and private property and create short-term disruptions to recreation-oriented travel and outdoor activity. Critical facilities and infrastructure potentially impacted include Hurricane City Hall and municipal facilities; Hurricane Police Department; Hurricane Valley Fire District facilities; Washington County School District schools and community facilities; public works, water, wastewater, stormwater, drainage, irrigation, storage, pumping, and distribution infrastructure; Interstate 15 access routes, State Route 9, State Route 7, State Route 59, major local roads, traffic signals, bridges, culverts, fleet vehicles, and evacuation routes; overhead and underground power and communications infrastructure; Sand Hollow Reservoir and Quail Creek Reservoir recreation-support facilities; parks, trailheads, campgrounds, marinas, commercial areas, tourism businesses, signs, solar arrays, HVAC equipment, utility corridors, lightweight structures, outdoor equipment, and public buildings vulnerable to hail-related roof and window damage, vehicle damage, equipment damage, hazardous travel conditions, recreation disruption, business interruption, and repair or replacement costs.
Santa Clara	**Vulnerabilities:** Santa Clara is vulnerable where residential neighborhoods, schools, parks, community facilities, vehicles, utility systems, and landscaped

Plan Participant	Vulnerabilities and Impacts
	areas are exposed to localized hail in the greater St. George urban area. Roof coverings, windows, siding, skylights, solar equipment, and outdoor furnishings are especially susceptible to repeated small or moderate hail events. **Impacts:** Hail can damage homes, vehicles, public facilities, windows, roofs, and outdoor amenities; disrupt travel during storms; and increase repair and replacement costs for residents and the city. Hail may also affect public events, park use, and utility operations where exposed equipment or facilities are damaged. Critical facilities and infrastructure potentially impacted include Santa Clara City Hall and municipal facilities; Santa Clara-Ivins Police Department facilities; Santa Clara fire and emergency response facilities; Washington County School District schools and community facilities; public works, water, wastewater, stormwater, drainage, irrigation, storage, pumping, and distribution infrastructure; Old Highway 91, Santa Clara Drive, Pioneer Parkway, traffic signals, local bridges, culverts, fleet vehicles, and local access routes; overhead and underground electric and communications infrastructure; rooftops, windows, skylights, siding, HVAC units, solar arrays, parks, trails, recreation facilities, signs, commercial areas, public buildings, community facilities, landscaped areas, and outdoor amenities vulnerable to hail damage, broken glass, roof and siding damage, dented vehicles, damaged utility equipment, temporary road hazards, public facility disruption, and increased maintenance costs.
Ivins	**Vulnerabilities:** Ivins is vulnerable where homes, roads, parks, public facilities, tourism-related amenities, vehicles, utility systems, and outdoor recreation assets are exposed to localized hailstorms across open desert terrain. Roofs, windows, solar equipment, HVAC units, vehicles, and outdoor furnishings are especially susceptible to hail damage. **Impacts:** Hail can damage homes, vehicles, public buildings, recreation amenities, and exposed utility or cooling equipment; create hazardous travel conditions; and interrupt public events and outdoor activity. The city may also face increased maintenance costs for parks, facilities, and landscaping, as well as short-term tourism and business disruption. Critical facilities and infrastructure potentially impacted include Ivins City Hall and municipal facilities; Santa Clara-Ivins Police Department facilities serving Ivins; Ivins fire and emergency response facilities; Washington County School District schools and community facilities; public works, water, wastewater, stormwater, drainage, irrigation, storage, pumping, and distribution infrastructure; Old Highway 91, Center Street, Snow Canyon Parkway, local access routes, bridges, culverts, traffic-control devices, fleet vehicles, and emergency routes; overhead and underground power and communications infrastructure; rooftops, windows, skylights, solar arrays, HVAC units, parks, trailheads, recreation facilities, signs, public buildings, tourism-related amenities, outdoor furnishings, utility equipment, and lightweight structures vulnerable to hail damage, broken glass, roof and siding damage, dented vehicles, equipment

Plan Participant	Vulnerabilities and Impacts
	damage, disrupted outdoor activity, temporary service interruption, and increased facility maintenance costs.
La Verkin	**Vulnerabilities:** La Verkin is vulnerable where homes, schools, roads, bridges, vehicles, utility systems, parks, and public facilities are exposed to localized hail in a corridor community with growing development. Roofs, siding, windows, skylights, and outdoor equipment can be damaged by even moderate hail, and the community's transportation connections increase exposure for vehicles and travelers. **Impacts:** Hail impacts could include damage to homes, vehicles, public facilities, and utilities; hazardous travel conditions on local roads and corridor routes; and interruption of public services and daily activity. Repeated hail may also increase long-term maintenance costs for buildings and outdoor infrastructure and affect tourism and traveler comfort in the area. Critical facilities and infrastructure potentially impacted include La Verkin City offices and municipal facilities; La Verkin Police Department; La Verkin fire and emergency response facilities; Washington County School District schools and community facilities; public works, water, wastewater, stormwater, drainage, storage, pumping, and utility infrastructure; State Route 9, State Route 17, local roads, bridges, culverts, traffic-control devices, fleet vehicles, and Zion gateway access routes; overhead and underground electric and communications infrastructure; rooftops, windows, skylights, siding, HVAC units, solar arrays, parks, trailheads, visitor-serving businesses, signs, public buildings, utility corridors, and outdoor equipment vulnerable to hail damage, broken glass, roof and siding damage, dented vehicles, hazardous travel conditions, utility equipment damage, visitor travel disruption, and increased maintenance or replacement costs.
Enterprise	**Vulnerabilities:** Enterprise is vulnerable where homes, schools, agricultural buildings, corrals, fences, vehicles, local businesses, roads, utility systems, and farm equipment are exposed across open rural terrain that can experience severe convective storms. Agricultural operations, outbuildings, roofing, windows, pivots, and outdoor equipment are especially susceptible to hail damage. **Impacts:** Potential impacts include roof and window damage, dented vehicles and equipment, damage to crops, forage, fencing, and agricultural structures, and hazardous travel conditions on local roads. Hail may also interrupt business and school activity, increase repair and replacement costs, and reduce seasonal farm income where agricultural assets are affected. Critical facilities and infrastructure potentially impacted include Enterprise City offices and municipal facilities; Enterprise Police Department; Enterprise fire and emergency response facilities; Washington County School District schools and community facilities; public works, water, wastewater, drainage, stormwater, irrigation, storage, pumping, and agricultural water infrastructure; State Route 18, local roads, bridges, culverts, traffic-control devices, fleet vehicles, and rural access routes; overhead and underground power and communications infrastructure; agricultural buildings, barns, sheds, fences, corrals, irrigation

Plan Participant	Vulnerabilities and Impacts
	equipment, pivots, crops, forage, livestock support facilities, parks, public buildings, signs, vehicles, equipment yards, and maintenance facilities vulnerable to hail-related roof and window damage, vehicle and equipment damage, crop and forage loss, damage to agricultural structures and fencing, hazardous travel conditions, business or school disruption, and increased repair and replacement costs.
Toquerville	**Vulnerabilities:** Toquerville is vulnerable where growing residential areas, vehicles, roads, utilities, parks, and public facilities are exposed to localized hailstorms associated with spring and summer thunderstorms. Continued development increases the amount of roofing, windows, siding, fences, and outdoor equipment that may be damaged by hail. **Impacts:** Hail can cause property damage, broken or weathered roofing materials, dented vehicles, damage to outdoor equipment and landscaping, and temporary travel hazards during storms. The town may also face interruption of public services, added maintenance costs, and localized economic impacts where homes or public facilities require repair. Critical facilities and infrastructure potentially impacted include Toquerville Town Hall and municipal facilities; Toquerville fire and emergency response facilities; public works and utility facilities; Washington County School District schools and community facilities serving the area; culinary water, irrigation, wastewater, stormwater, drainage, storage, pumping, and distribution infrastructure; State Route 17, Interstate 15 access routes, local roads, bridges, culverts, traffic-control devices, fleet vehicles, and evacuation routes; overhead and underground electric and communications infrastructure; rooftops, windows, skylights, siding, solar arrays, HVAC units, parks, trails, public buildings, signs, visitor-serving facilities, outdoor equipment, and developing neighborhood infrastructure vulnerable to hail damage, dented vehicles, broken glass, roof and siding damage, damaged utility equipment, temporary travel hazards, interrupted public services, and increased repair costs.
Leeds	**Vulnerabilities:** Leeds is vulnerable where homes, Interstate 15 access, local roads, vehicles, utility systems, and community facilities are exposed to hail along a major transportation corridor and open terrain. Roofs, windows, siding, signage, vehicles, and exposed utility or communications equipment are particularly susceptible to hail damage. **Impacts:** Potential impacts include damage to residences and infrastructure, hazardous travel conditions affecting local and interstate traffic, vehicle damage, and temporary interruption of utility service or community functions. Hail may also create broader regional transportation and safety consequences because of the town's connection to a major travel corridor.Critical facilities and infrastructure potentially impacted include Leeds Town Hall and public works facilities; Leeds fire and emergency response facilities; water, wastewater, stormwater, drainage, storage, pumping, and utility infrastructure; Interstate 15, Main Street, local roads, bridges, culverts, traffic-control devices, access ramps, fleet vehicles, and evacuation routes; overhead and

Plan Participant	Vulnerabilities and Impacts
	underground electric and communications infrastructure; rooftops, windows, siding, skylights, HVAC units, solar arrays, parks, public buildings, signs, utility corridors, community facilities, and corridor-related infrastructure vulnerable to hail damage, vehicle damage, broken glass, roof and siding damage, hazardous travel conditions, interstate access disruption, utility equipment damage, service interruption, and increased maintenance costs.
Virgin	**Vulnerabilities:** Virgin is vulnerable because homes, lodging, restaurants, visitor-serving businesses, roads, vehicles, utility systems, and outdoor recreation support assets are exposed to localized hail in the Zion gateway corridor. Roofs, windows, skylights, vehicles, signage, and outdoor furnishings are especially susceptible, and visitor activity increases exposure of parked vehicles and outdoor assets. **Impacts:** Hail can damage tourism-related businesses, residences, vehicles, roofs, windows, and outdoor equipment; create hazardous travel conditions on SR-9; and interrupt visitor activity and local commerce. Even short-duration hail events may generate repair costs, temporary business disruption, and added demands on local response and cleanup. Critical facilities and infrastructure potentially impacted include Virgin Town Hall and municipal facilities; Virgin fire and emergency response facilities; public works, water, wastewater, drainage, storage, pumping, and utility infrastructure; State Route 9, local roads, bridges, culverts, traffic-control devices, fleet vehicles, evacuation routes, and Zion gateway access routes; overhead and underground electric and communications infrastructure; lodging, restaurants, visitor-serving businesses, parks, trailheads, campgrounds, recreation access points, signs, public buildings, rooftops, windows, skylights, HVAC units, solar arrays, outdoor furnishings, and utility corridors vulnerable to hail damage, dented vehicles, broken glass, roof and siding damage, damaged outdoor equipment, hazardous SR-9 travel conditions, visitor activity disruption, business interruption, and increased repair costs.
Springdale	**Vulnerabilities:** Springdale is highly vulnerable because lodging, restaurants, homes, vehicles, public facilities, roads, utilities, and visitor-serving businesses are concentrated in a narrow Zion gateway corridor with heavy seasonal traffic and extensive outdoor exposure. Roofs, windows, skylights, signs, outdoor dining or recreation areas, and parked vehicles are all susceptible to hail damage. **Impacts:** Potential impacts include damage to hotels, businesses, homes, vehicles, and public facilities; hazardous travel conditions; and disruption to tourism, local commerce, and access in the Zion gateway area. Even moderate hail can create outsized economic and operational impacts because of high visitor volumes, limited transportation redundancy, and the town's reliance on visitor-serving infrastructure. Critical facilities and infrastructure potentially impacted include Springdale Town Hall and municipal facilities; Springdale Police Department and emergency response facilities; public works, water, wastewater, drainage, stormwater, storage, pumping, and utility infrastructure; State Route 9, Zion Canyon access routes, shuttle-related transportation

Plan Participant	Vulnerabilities and Impacts
	facilities, bridges, culverts, traffic-control devices, local access routes, fleet vehicles, and evacuation routes; overhead and underground electric and communications infrastructure; hotels, restaurants, lodging areas, employee housing, visitor facilities, parks, trailheads, public buildings, signs, rooftops, windows, skylights, HVAC units, solar arrays, outdoor dining areas, recreation assets, and visitor-serving infrastructure vulnerable to hail damage, vehicle damage, broken glass, roof and siding damage, damaged outdoor equipment, hazardous travel conditions, tourism disruption, shuttle and visitor access impacts, and increased repair or replacement costs.
New Harmony	**Vulnerabilities:** New Harmony is vulnerable where homes, roads, agricultural buildings, vehicles, water system components, and community facilities are exposed to hail in a rural mountain-valley setting. Roofs, windows, siding, outbuildings, fencing, vehicles, and seasonal agricultural assets can all be damaged by localized hailstorms. **Impacts:** Hail can damage homes, vehicles, outbuildings, agricultural assets, and local infrastructure; create hazardous driving conditions; and interrupt access, school travel, and local services. Recovery may be slower where staffing, repair capacity, and financial resources are limited, particularly if multiple private and public assets are damaged at once. Critical facilities and infrastructure potentially impacted include New Harmony Town Hall and municipal facilities; fire and emergency response facilities; public works, local and domestic water systems, wells, storage, pumping, wastewater, drainage, and utility infrastructure; Interstate 15, State Route 144, local roads, bridges, culverts, traffic-control devices, fleet vehicles, rural access routes, and evacuation routes; overhead and underground electric and communications infrastructure; agricultural and open lands, irrigation systems, livestock water supplies, barns, sheds, fences, outbuildings, public buildings, parks, community facilities, rooftops, windows, vehicles, equipment yards, and utility corridors vulnerable to hail damage, broken glass, roof and siding damage, dented vehicles, damage to agricultural structures and equipment, hazardous travel conditions, delayed emergency access, and increased repair costs in a rural setting.
Rockville	**Vulnerabilities:** Rockville is vulnerable because homes, historic resources, vehicles, roads, utility systems, and visitor-serving spaces in the Virgin River corridor are exposed to localized hail in a small gateway community with limited infrastructure and heavy seasonal visitation. Historic structures, older roofing materials, windows, signs, and parked vehicles are especially susceptible to hail damage. **Impacts:** Hail can damage homes, historic resources, vehicles, windows, roofs, and outdoor amenities; create hazardous travel conditions; and disrupt visitor activity and local services. Because the community is small and access is limited, even localized hail damage can affect tourism, emergency response, and recovery operations more noticeably than in larger jurisdictions. Critical facilities and infrastructure potentially impacted include Rockville Town Hall and municipal facilities; fire and emergency response facilities; public works,

Plan Participant	Vulnerabilities and Impacts
	water, wastewater, drainage, storage, pumping, and utility infrastructure; State Route 9, local roads, bridges, culverts, traffic-control devices, fleet vehicles, evacuation routes, and Zion gateway access routes; overhead and underground electric and communications infrastructure; historic buildings, homes, parks, trailheads, visitor-serving facilities, public buildings, signs, rooftops, windows, skylights, HVAC units, solar arrays, outdoor furnishings, public spaces, and scenic or historic community resources vulnerable to hail damage, broken glass, roof and siding damage, vehicle damage, damaged outdoor amenities, hazardous travel conditions, visitor disruption, and increased repair costs for historic and community assets.
Apple Valley	**Vulnerabilities:** Apple Valley is vulnerable where dispersed residential development, local roads, vehicles, water and utility systems, and community facilities are exposed to localized hailstorms in a rural-residential setting. Roofs, siding, windows, vehicles, outbuildings, and outdoor equipment are susceptible to hail damage, especially where assets are spread out and exposed. **Impacts:** Hail can damage homes, vehicles, outdoor equipment, and community infrastructure; create hazardous travel conditions; and interrupt access to services and emergency response. Recovery could be challenging if multiple dispersed neighborhoods are affected at once or if repairs require outside contractors and extended replacement timelines. Critical facilities and infrastructure potentially impacted include Apple Valley Town Hall and municipal facilities; fire and emergency response facilities; public works, community water systems, wells, storage, pumping, wastewater, drainage, and utility infrastructure; State Route 59, local roads, bridges, culverts, washes, traffic-control devices, fleet vehicles, rural access routes, and evacuation routes; overhead and underground electric and communications infrastructure; parks, community facilities, dispersed residential water systems, public buildings, rooftops, windows, siding, vehicles, sheds, fences, outbuildings, outdoor equipment, utility corridors, open-space resources, and limited agricultural or livestock support infrastructure vulnerable to hail damage, broken glass, roof and siding damage, dented vehicles, equipment damage, hazardous travel conditions, delayed emergency response, service interruption, and repair challenges across dispersed neighborhoods.
Hildale	**Vulnerabilities:** Hildale is vulnerable where homes, schools, roads, vehicles, utility and water systems, public facilities, and outdoor assets are exposed to hail in a rugged terrain setting with limited infrastructure redundancy. Roofs, windows, siding, vehicles, fencing, and exposed utility or water system components can all be damaged by localized hailstorms. **Impacts:** Potential impacts include damage to homes, schools, vehicles, utility infrastructure, and outdoor equipment; hazardous travel conditions; and disruption of public safety operations and local services. In a community with ongoing infrastructure needs, hail damage may add to maintenance backlogs and require outside technical and financial assistance for recovery. Critical facilities and infrastructure potentially impacted include Hildale City Hall and

Plan Participant	Vulnerabilities and Impacts
	municipal facilities; Hildale Police Department; Hildale fire and emergency response facilities; Water Canyon School and other community facilities; public works, culinary water, wastewater, stormwater, drainage, storage, pumping, and utility infrastructure; Utah State Route 59, local roads, bridges, culverts, washes, traffic-control devices, fleet vehicles, community access routes, and evacuation routes; overhead and underground electric and communications infrastructure; parks, public buildings, residential water systems, rooftops, windows, siding, HVAC units, solar arrays, fencing, outdoor equipment, utility corridors, and structures in rugged or drainage-sensitive areas vulnerable to hail damage, broken glass, roof and siding damage, vehicle damage, utility equipment damage, hazardous travel conditions, interruption of public safety operations, maintenance backlogs, and need for outside repair assistance.

Landslide

Table 168 summarizes landslide vulnerabilities and potential impacts for Washington County participants.

Table 168: Landslide Vulnerability and Impact Assessment for Washington County

Plan Participant	Vulnerabilities and Impacts
Washington County	**Vulnerabilities:** Washington County has landslide vulnerability associated with rapid population growth, extensive hillside and bench development, dense transportation networks, and the concentration of people, infrastructure, and economic activity in and around St. George, Washington, Santa Clara, Ivins, Hurricane, La Verkin, and other expanding communities. The county had about 180,279 residents in 2020, an estimated 213,670 residents in 2025, about 69,786 households, and roughly 91,460 housing units, which provide countywide planning context rather than a mapped exposure count. Vulnerability occurs where neighborhoods, schools, utilities, and roads intersect steep slopes, benches, canyon mouths, and unstable drainage corridors. Vulnerable assets include Interstate 15, SR-9, SR-18, SR-34, SR-7, airport access routes, local hillside roads, schools, hospitals, utilities, and developed areas affected by slope instability such as the Truman Drive landslide in Santa Clara, which measured at least 300 feet wide by 150 feet long.[261]

[261] U.S. Census Bureau, QuickFacts: Washington County, Utah, V2025 population and housing estimates, 2020 Census, and 2020-2024 ACS. https://www.census.gov/quickfacts/fact/table/washingtoncountyutah/PST045225. Accessed October 9, 2026. Countywide totals are planning context, not mapped hazard exposure. Utah Geological Survey, Truman Drive Landslide, Washington County, updated June 6, 2023. https://geology.utah.gov/portfolio-item/truman-drive-landslide/. The documented slide was at least 300 feet wide by 150 feet long; the source reports scarps and ponding but no building damage. These sources do not establish the comparative vulnerability ranking or exposure of all listed assets.

Plan Participant	Vulnerabilities and Impacts
	Impacts: Landslides can damage homes and developed lots near unstable slopes, impair major and local transportation corridors, disrupt water, sewer, stormwater, power, and communications infrastructure, and interrupt access for residents, schools, emergency responders, businesses, and visitors. Countywide impacts may include debris removal, slope stabilization, roadway and utility repair, evacuation, temporary displacement, loss of airport and hospital access, and disruption to tourism and regional commerce. Because the county contains dense urban development and gateway corridors, even localized slope failures can create broad community-wide consequences and repeated maintenance burdens. Critical facilities and infrastructure potentially impacted include Washington County Sheriff's Office; Washington County Emergency Management; St. George 911 Communications Center; Southwest Utah Public Health Department; St. George Regional Hospital; Washington County School District facilities; Utah Tech University facilities; Dixie Technical College facilities; county and municipal government buildings; public safety facilities; public works facilities; Interstate 15, State Route 9, State Route 18, State Route 34, State Route 7/Southern Parkway, and other regional roadways, bridges, culverts, retaining walls, drainage crossings, airport access routes, hillside roads, evacuation routes, and emergency response routes; St. George Regional Airport and supporting access and utility infrastructure; Washington County Water Conservancy District reservoirs, pipelines, pump stations, water storage, and distribution infrastructure; municipal water, wastewater, stormwater, drainage, power, communications, fiber, cellular, and utility systems; residential neighborhoods, schools, commercial corridors, hospitals and clinics, parks, trailheads, campgrounds, recreation access corridors, Zion gateway travel routes, visitor-serving facilities, and public buildings located on or below steep slopes, developed benches, canyon mouths, alluvial fans, incised drainages, unstable slopes, post-wildfire runoff areas, and slope-modified terrain vulnerable to landslides, rockfall, debris flows, rotational movement, embankment failure, culvert blockage, drainage erosion, roadway damage, utility disruption, evacuation constraints, and interrupted access.
St. George	**Vulnerabilities:** St. George is highly vulnerable because of rapid growth, hillside and bench development, major transportation routes, utilities, schools, medical facilities, and public infrastructure located near steep slopes, drainage corridors, and unstable geologic materials. As the county's principal urban center, St. George contains the largest concentration of homes, businesses, and public facilities potentially affected by slope failure, especially where development expands into foothill and bench areas or near incised drainages and modified slopes. **Impacts:** Landslides can damage homes, roads, retaining structures, utilities, and public facilities; interrupt access to neighborhoods, schools, and hospitals; and create expensive long-term stabilization and maintenance needs. Slope failure could also disrupt commuter travel, local commerce, drainage systems, and emergency response in the county's primary service center, causing

Plan Participant	Vulnerabilities and Impacts
	broader regional consequences even when impacts begin at a single site. Critical facilities and infrastructure potentially impacted include St. George City Hall and municipal government facilities; St. George Police Department; St. George Fire Department stations; St. George 911 Communications Center; St. George Regional Hospital; Utah Tech University facilities; Dixie Technical College facilities; Washington County School District schools and support facilities; St. George Regional Airport and airport access routes; public works, water, wastewater, stormwater, and drainage facilities; Interstate 15, State Route 7/Southern Parkway, Bluff Street, River Road, St. George Boulevard, Riverside Drive, hillside roads, bridges, culverts, retaining walls, drainage crossings, and major arterials; Washington County Water Conservancy District facilities serving the St. George area; electric substations, overhead and underground power systems, communications, fiber, cellular, and utility infrastructure; hospitals, clinics, medical offices, commercial centers, hotels, warehouses, parks, trail systems, golf courses, recreation facilities, public buildings, hillside neighborhoods, and bench or slope-adjacent development vulnerable to slope movement, rockfall, debris deposition, retaining wall failure, road blockage, drainage erosion, utility interruption, airport access disruption, emergency response delays, and increased slope stabilization and repair costs.
Washington City	**Vulnerabilities:** Washington City is vulnerable because continued growth places more homes, schools, roads, utilities, parks, and public facilities near benches, drainage corridors, and unstable slopes influenced by clay-rich soils and slope-modified terrain. Its proximity to the St. George urban area means that local neighborhoods and infrastructure may be exposed where hillside grading, concentrated runoff, or geologic conditions reduce slope stability. **Impacts:** Landslides could damage homes and local infrastructure, undermine roads and drainage facilities, interrupt utilities, and disrupt school access, emergency response, and daily travel. Even a localized slope failure could require roadway closure, debris removal, geotechnical evaluation, and costly repair of public works and private property in growing residential areas. Critical facilities and infrastructure potentially impacted include Washington City offices and municipal facilities; Washington City Police Department; Washington City Fire Department facilities; Washington County School District schools and community facilities; public works facilities; culinary water, irrigation, wastewater, stormwater, drainage, storage, pumping, and distribution infrastructure; Interstate 15, State Route 9, Telegraph Street, Green Spring Drive, Washington Parkway, hillside access roads, bridges, culverts, retaining walls, drainage crossings, traffic-control devices, and emergency routes; Washington County Water Conservancy District facilities serving the Washington area; power, communications, fiber, cellular, and utility infrastructure; parks, trail systems, sports fields, commercial centers, public buildings, neighborhoods near benches, drainage corridors, alluvial fans, and slope transition areas vulnerable to landslides, rockfall, debris

Plan Participant	Vulnerabilities and Impacts
	movement, drainage erosion, roadway distress, culvert blockage, utility disruption, slope stabilization needs, and interrupted emergency access.
Hurricane	**Vulnerabilities:** Hurricane is highly vulnerable because of expanding residential and commercial growth near steep terrain, alluvial slopes, drainage corridors, and transportation links in the Hurricane Valley. Homes, roads, bridges, schools, utilities, and public facilities may be exposed where slope instability, runoff erosion, and post-wildfire conditions affect foothills, bench development, or canyon-adjacent areas. **Impacts:** Landslides can damage roads, homes, retaining features, utilities, and drainage systems; disrupt emergency access and commuter travel; and create costly stabilization and repair needs. Slope failures may also isolate neighborhoods, affect recreation-related travel, and generate recurring maintenance burdens where unstable areas continue to move after the initial event. Critical facilities and infrastructure potentially impacted include Hurricane City Hall and municipal facilities; Hurricane Police Department; Hurricane Valley Fire District facilities; Washington County School District schools and community facilities; public works, water, wastewater, stormwater, drainage, irrigation, storage, pumping, and distribution infrastructure; Interstate 15 access routes, State Route 9, State Route 7/Southern Parkway, State Route 59, hillside and mesa access roads, bridges, culverts, retaining walls, drainage crossings, evacuation routes, and major local roads; Sand Hollow Reservoir and Quail Creek Reservoir recreation-support, dam, spillway, access, and utility infrastructure; power, communications, fiber, cellular, and utility corridors; parks, trailheads, campgrounds, marinas, commercial areas, tourism businesses, public buildings, and developing neighborhoods near steep slopes, mesas, benches, drainage corridors, and post-wildfire runoff areas vulnerable to rockfall, debris flows, slope failure, drainage erosion, embankment failure, road blockage, utility outages, recreation access disruption, and emergency response delays.
Santa Clara	**Vulnerabilities:** Santa Clara is highly vulnerable because developed benches, hillside neighborhoods, roads, utilities, and public facilities are directly exposed to slope instability in an area with known landslide activity. The Truman Drive landslide documented in 2023 measured at least 300 feet wide by 150 feet long, demonstrating that active movement can affect developed residential settings and public infrastructure within the city.[262] **Impacts:** Landslides can damage neighborhood roads, retaining walls, utilities, and homes; create public safety concerns; and require repeated stabilization, monitoring, and infrastructure repair. Continued slope movement may also reduce property access, increase maintenance costs, and disrupt emergency response and city operations in affected neighborhoods. Critical facilities and infrastructure potentially impacted include Santa Clara

[262] Utah Geological Survey, Truman Drive Landslide, Washington County, updated June 6, 2023. https://geology.utah.gov/portfolio-item/truman-drive-landslide/. The documented slide was at least 300 feet wide by 150 feet long; the source reports scarps and ponding but no building damage.

Plan Participant	Vulnerabilities and Impacts
	City Hall and municipal facilities; Santa Clara-Ivins Police Department facilities; Santa Clara fire and emergency response facilities; Washington County School District schools and community facilities; public works, water, irrigation, wastewater, stormwater, drainage, storage, pumping, and distribution systems; Old Highway 91, Santa Clara Drive, Pioneer Parkway, hillside and bench access roads, bridges, culverts, retaining walls, drainage crossings, and emergency routes; Santa Clara River corridor infrastructure; power, communications, fiber, cellular, and utility infrastructure; parks, trails, recreation areas, public buildings, commercial areas, neighborhoods, and slope-adjacent development near the Santa Clara bench, foothills, drainage corridors, and Truman Drive landslide area vulnerable to active slope movement, rockfall, debris flows, rotational landslides, road and retaining wall damage, utility disruption, drainage alteration, evacuation constraints, and recurring slope stabilization and maintenance needs.
Ivins	**Vulnerabilities:** Ivins is vulnerable where neighborhoods, roads, utility systems, public facilities, and tourism-related amenities are located near slope transitions, benches, drainage edges, and desert foothill terrain that can become unstable during intense rainfall, erosion, or post-wildfire runoff. Continued growth and reliance on limited roadway and utility connections increase sensitivity to slope failure in localized hillside areas. **Impacts:** Landslides can damage roads, utilities, drainage systems, and nearby structures; interrupt access to neighborhoods and recreation amenities; and require costly stabilization and repair. Slope failure may also reduce emergency response reliability, affect public events and tourism access, and create recurring maintenance issues where unstable terrain remains active. Critical facilities and infrastructure potentially impacted include Ivins City Hall and municipal facilities; Santa Clara-Ivins Police Department facilities serving Ivins; Ivins fire and emergency response facilities; Washington County School District schools and community facilities; public works, water, wastewater, stormwater, drainage, irrigation, storage, pumping, and distribution infrastructure; Old Highway 91, Center Street, Snow Canyon Parkway, local hillside access routes, bridges, culverts, retaining walls, drainage crossings, and emergency routes; overhead and underground power, communications, fiber, cellular, and utility infrastructure; parks, trailheads, recreation facilities, public buildings, tourism-related amenities, neighborhoods, and structures near slope transitions, desert-edge terrain, foothills, washes, alluvial fans, and canyon mouths vulnerable to rockfall, slope instability, debris movement, drainage erosion, roadway damage, retaining wall failure, utility outages, recreation access disruption, and temporary neighborhood isolation.
La Verkin	**Vulnerabilities:** La Verkin is highly vulnerable because of its location near steep terrain, drainage corridors, SR-9 access, bridges, utilities, and developed areas that may be affected by slope instability, rockfall, or erosion-related movement. The community's river-corridor setting, transportation dependence, and proximity to canyon and bench terrain increase vulnerability where roads and public infrastructure interface with unstable slopes.

Plan Participant	Vulnerabilities and Impacts
	Impacts: Landslides can damage roads, utilities, bridge approaches, and homes; interrupt SR-9 and local travel; and affect emergency access to nearby communities. Slope failure and rockfall could also increase maintenance costs, create detours, and disrupt tourism and daily commerce in this corridor community. Critical facilities and infrastructure potentially impacted include La Verkin City offices and municipal facilities; La Verkin Police Department; La Verkin fire and emergency response facilities; Washington County School District schools and community facilities; public works, water, wastewater, stormwater, drainage, storage, pumping, and utility infrastructure; State Route 9, State Route 17, local hillside roads, bridges, culverts, retaining walls, drainage crossings, evacuation routes, and Zion gateway access routes; La Verkin Creek, Ash Creek, Virgin River corridor, and adjacent slope infrastructure; overhead and underground electric, communications, fiber, cellular, and utility infrastructure; parks, trailheads, visitor-serving businesses, public buildings, neighborhoods, and river- or slope-adjacent facilities vulnerable to rockfall, landslides, debris movement, embankment failure, drainage erosion, roadway blockage, utility outages, evacuation constraints, and disruption of Zion gateway access.
Enterprise	**Vulnerabilities:** Enterprise is vulnerable where local roads, homes, agricultural support facilities, utility systems, and dispersed development intersect steeper terrain, drainage crossings, and slope-sensitive rural areas. While the community has a smaller population than the county's urban jurisdictions, limited route redundancy and reliance on local infrastructure increase sensitivity to rockfall, embankment failure, erosion, and roadway disruption. **Impacts:** Landslides can damage roads, culverts, utilities, agricultural access routes, and nearby structures; isolate residents or rural service areas; and interrupt school, business, and emergency access. Recovery may be prolonged where staffing, equipment, and funding are limited and outside technical assistance is needed for geotechnical evaluation and roadway repair. Critical facilities and infrastructure potentially impacted include Enterprise City offices and municipal facilities; Enterprise Police Department; Enterprise fire and emergency response facilities; Washington County School District schools and community facilities; public works, municipal and domestic water systems, wells, wastewater, drainage, stormwater, irrigation, storage, pumping, and agricultural water infrastructure; State Route 18, local roads, bridges, culverts, drainage crossings, rural access routes, and emergency routes; reservoirs, irrigation systems, canals, storage ponds, farms, ranches, barns, corrals, fields, and agricultural support facilities; power, communications, fiber, cellular, and utility infrastructure; parks, public buildings, maintenance yards, and rural development near slopes, drainageways, embankments, and erosion-prone terrain vulnerable to localized landslides, slope failure, road shoulder or embankment instability, culvert blockage, drainage erosion, utility interruption, agricultural access disruption, and delayed emergency response.
Toquerville	**Vulnerabilities:** Toquerville is vulnerable because growing neighborhoods, roads, drainage crossings, utilities, and public facilities are located near

Plan Participant	Vulnerabilities and Impacts
	steeper terrain, benches, and erosion-prone slopes that may become unstable during intense rainfall, runoff, or post-wildfire conditions. Continued residential growth increases the number of structures and local roads potentially exposed to slope movement or embankment failure. **Impacts:** Landslides can damage roads, drainage infrastructure, utilities, and nearby homes; isolate neighborhoods; and disrupt emergency access and daily travel. The town may also face significant repair and stabilization costs, recurring maintenance, and public safety concerns where slope conditions remain unstable after an initial failure. Critical facilities and infrastructure potentially impacted include Toquerville Town Hall and municipal facilities; Toquerville fire and emergency response facilities; public works and utility facilities; Washington County School District schools and community facilities serving the area; culinary water, irrigation, wastewater, stormwater, drainage, storage, pumping, and distribution infrastructure; State Route 17, Interstate 15 access routes, local hillside roads, bridges, culverts, retaining walls, drainage crossings, evacuation routes, and developing neighborhood access roads; Ash Creek and La Verkin Creek watershed drainage infrastructure; power, communications, fiber, cellular, and utility infrastructure; parks, trails, public buildings, visitor-serving facilities, and neighborhoods near benches, drainage corridors, canyon-influenced terrain, and slope transition areas vulnerable to landslides, rockfall, debris-laden slope failures, erosion, culvert blockage, road and retaining wall damage, utility interruption, neighborhood isolation, and emergency access disruption.
Leeds	**Vulnerabilities:** Leeds is vulnerable where homes, Interstate 15 access, local roads, bridges, utility systems, and community facilities are located near steep slopes, cuts, embankments, and geologically constrained terrain. The town's position near major transportation corridors and rugged topography increases susceptibility to rockfall, slope failure, and erosion-related roadway damage. **Impacts:** Landslides can block or damage local roads and interstate connections, disrupt utilities, affect nearby residences, and interrupt emergency response and commuter travel. Because of Leeds' connection to a major regional corridor, even a localized slope failure can create wider transportation, safety, and public works consequences. Critical facilities and infrastructure potentially impacted include Leeds Town Hall and public works facilities; Leeds fire and emergency response facilities; water, wastewater, stormwater, drainage, storage, pumping, and utility infrastructure; Interstate 15, Main Street, local hillside roads, bridges, culverts, retaining walls, access ramps, drainage crossings, evacuation routes, and corridor transportation infrastructure; Leeds Creek, Quail Creek, and nearby drainage corridor infrastructure; overhead and underground electric, communications, fiber, cellular, and utility infrastructure; parks, public buildings, community facilities, and corridor-related infrastructure near steep slopes, geologic constraints, embankments, washes, and canyon margins vulnerable to landslides, rockfall, slope instability, roadway and bridge damage, retaining wall failure, culvert

Plan Participant	Vulnerabilities and Impacts
	blockage, utility outages, interstate access disruption, and delayed emergency response.
Virgin	**Vulnerabilities:** Virgin is vulnerable because homes, lodging, restaurants, visitor-serving businesses, roads, SR-9 access, utilities, and outdoor recreation support assets are located in the Zion gateway corridor near steep slopes, canyon walls, and unstable terrain. Limited transportation redundancy and heavy visitor traffic increase exposure where rockfall, slope failure, or debris movement affect corridor travel and developed areas. **Impacts:** Landslides can damage roads, utilities, businesses, and nearby residences; disrupt SR-9 travel, evacuation, and emergency response; and reduce access for visitors and residents. Economic impacts may extend beyond physical damage through lost tourism activity, cleanup and stabilization costs, and interruption of local commerce and gateway operations. Critical facilities and infrastructure potentially impacted include Virgin Town Hall and municipal facilities; Virgin fire and emergency response facilities; public works, water, wastewater, drainage, storage, pumping, and utility infrastructure; State Route 9, local roads, bridges, culverts, retaining walls, drainage crossings, evacuation routes, and Zion gateway access routes; Virgin River corridor and adjacent slope infrastructure; overhead and underground electric, communications, fiber, cellular, and utility corridors; lodging, restaurants, visitor-serving businesses, parks, trailheads, campgrounds, recreation access points, public buildings, and neighborhoods near steep terrain, river corridors, canyon mouths, and drainage-sensitive slopes vulnerable to landslides, rockfall, debris flows, river-corridor ground failure, roadway blockage, utility interruption, SR-9 access disruption, evacuation constraints, tourism disruption, and emergency response delays.
Springdale	**Vulnerabilities:** Springdale is highly vulnerable because development is concentrated in a narrow Zion gateway corridor with steep slopes, canyon walls, limited transportation redundancy, and high visitor volumes. Homes, hotels, businesses, roads, bridges, utilities, and public facilities are exposed to rockfall, debris flow, and slope failure affecting corridor access and developed areas, especially during intense rainfall or post-wildfire runoff. Although a smaller community in population (Pop. 602 in 2025) Springdale's exposure is amplified by the countywide concentration of 213,670 residents in 2025 and dependence on SR-9, one of the county's key landslide-sensitive lifeline corridors serving Zion access and nearby communities. **Impacts:** Landslides can damage buildings, roads, bridges, and utilities; interrupt SR-9 access, evacuation, and emergency response; and create major disruptions to tourism and local commerce. Even a moderate slope failure or rockfall event can create outsized life safety and economic consequences because the town depends on a single constrained travel corridor and a visitor-based economy. The 1992 earthquake-triggered landslide near Springdale destroyed homes and blocked Highway 9, demonstrating that slope failures in this corridor can cause direct structural loss and complete

Plan Participant	Vulnerabilities and Impacts
	transportation disruption.[263] Critical facilities and infrastructure potentially impacted include Springdale Town Hall and municipal facilities; Springdale Police Department and emergency response facilities; public works, water, wastewater, drainage, stormwater, storage, pumping, and utility infrastructure; State Route 9, Zion Canyon access routes, shuttle-related transportation facilities, local roads, bridges, culverts, retaining walls, drainage crossings, evacuation routes, and visitor access corridors; Virgin River corridor and canyon-slope infrastructure; overhead and underground electric, communications, fiber, cellular, and utility infrastructure; hotels, restaurants, lodging areas, employee housing, visitor facilities, parks, trailheads, public buildings, Zion gateway recreation assets, and public gathering areas in the narrow canyon corridor vulnerable to landslides, rockfall, debris flows, road blockage, retaining wall failure, slope movement, utility outages, evacuation constraints, emergency access disruption, visitor access disruption, and major tourism-related economic impacts.
New Harmony	**Vulnerabilities:** New Harmony is vulnerable where local roads, homes, water infrastructure, agricultural lands, and community facilities are exposed to slope instability in a rural mountain-valley setting with limited alternate access. Steep surrounding terrain, winter runoff, erosion, and post-wildfire conditions can increase susceptibility to rockfall, embankment failure, and localized slope movement affecting transportation and utilities. **Impacts:** Landslides can damage roads, culverts, utilities, and nearby structures; interrupt school, commuter, and emergency access; and increase costs for roadway repair and slope stabilization. Recovery may be slower where local staffing and equipment are limited and outside support is needed to restore access and critical services. Critical facilities and infrastructure potentially impacted include New Harmony Town Hall and municipal facilities; fire and emergency response facilities; public works, local and domestic water systems, wells, storage, pumping, wastewater, drainage, and utility infrastructure; Interstate 15, State Route 144, local roads, bridges, culverts, retaining walls, drainage crossings, evacuation routes, and rural access roads; Ash Creek watershed drainage crossings and nearby slope infrastructure; power, communications, fiber, cellular, and utility corridors; agricultural and open lands, irrigation systems, livestock water supplies, parks, community facilities, public buildings, public landscapes, and rural development near mountain-valley slopes, drainage corridors, and embankments vulnerable to landslides, rockfall, slope instability, culvert blockage, road washout, utility interruption, isolation, and delayed emergency response.
Rockville	**Vulnerabilities:** Rockville is highly vulnerable because of its small historic and residential development pattern along the Virgin River corridor, constrained

[263] Utah Geological Survey, Investigation of Geologic Effects Associated with the September 2, 1992, St. George Earthquake, September 24, 1992. https://geodata.geology.utah.gov/pages/download.php?direct=1&noattach=true&ref=11053&ext=pdf. Source for structural damage in Hurricane and New Harmony and the Springdale landslide, destroyed homes, and SR-9 blockage.

Plan Participant	Vulnerabilities and Impacts
	evacuation routes, and direct proximity to steep slopes and canyon walls in the Zion gateway area. Homes, historic resources, roads, bridges, utilities, and public spaces are susceptible to rockfall, debris flow, slope failure, and erosion where unstable terrain intersects developed areas and corridor travel. **Impacts:** Landslides can damage homes, historic resources, roads, bridges, and utilities; block access for residents and visitors; and complicate evacuation and emergency response. Because Rockville is small and transportation options are limited, even localized slope failure can have disproportionate effects on public safety, tourism, and long-term recovery. Critical facilities and infrastructure potentially impacted include Rockville Town Hall and municipal facilities; fire and emergency response facilities; public works, water, wastewater, drainage, storage, pumping, and utility infrastructure; State Route 9, local roads, bridges, culverts, retaining walls, drainage crossings, evacuation routes, and Zion gateway access routes; Virgin River corridor and adjacent canyon-slope infrastructure; overhead and underground electric, communications, fiber, cellular, and utility infrastructure; historic buildings, homes, parks, trailheads, visitor-serving facilities, public buildings, public spaces, and scenic or historic community resources in a constrained gateway corridor vulnerable to landslides, rockfall, debris flows, retaining wall failure, slope movement, roadway blockage, utility outages, constrained evacuation, emergency access disruption, and increased repair costs for historic and community assets.
Apple Valley	**Vulnerabilities:** Apple Valley is vulnerable where dispersed residential development, local roads, drainage crossings, utilities, and water infrastructure are exposed to localized slope instability in a rural-residential setting. The community's modest infrastructure systems, limited access redundancy, and open terrain can increase sensitivity where erosion, embankment failure, or slope movement affects roads, utilities, or nearby homes. **Impacts:** Landslides can damage roads, culverts, utility systems, and nearby structures; interrupt emergency response and access to essential services; and require outside support for repair and stabilization. Recovery may be challenging if multiple dispersed neighborhoods are affected or if access routes remain unstable after the initial event. Critical facilities and infrastructure potentially impacted include Apple Valley Town Hall and municipal facilities; fire and emergency response facilities; public works, community water systems, wells, storage, pumping, wastewater, drainage, and utility infrastructure; State Route 59, local roads, bridges, culverts, washes, retaining walls, drainage crossings, evacuation routes, and rural access roads; power, communications, fiber, cellular, and utility corridors; parks, community facilities, dispersed residential water systems, public buildings, open-space resources, limited agricultural or livestock support infrastructure, and maintenance facilities near slopes, washes, embankments, and drainage-sensitive terrain vulnerable to landslides, slope failure, rockfall, erosion, culvert

Plan Participant	Vulnerabilities and Impacts
	blockage, road damage, utility disruption, delayed emergency access, and service challenges across dispersed neighborhoods.
Hildale	**Vulnerabilities:** Hildale is vulnerable where homes, roads, utility and water systems, schools, and public facilities are located in rugged terrain and drainage-sensitive areas with limited infrastructure redundancy. Steep slopes, erosion-prone drainages, and constrained access routes increase exposure to rockfall, debris movement, and slope failure affecting transportation and service delivery. **Impacts:** Landslides can damage roads, utilities, public facilities, and nearby homes; disrupt emergency response and public safety operations; and isolate parts of the community. In a community with ongoing infrastructure needs, slope failure may add substantial repair demands and require outside technical and financial assistance to restore services and stabilize affected areas. Critical facilities and infrastructure potentially impacted include Hildale City Hall and municipal facilities; Hildale Police Department; Hildale fire and emergency response facilities; Water Canyon School and other community facilities; public works, culinary water, wastewater, stormwater, drainage, storage, pumping, and utility infrastructure; Utah State Route 59, local roads, bridges, culverts, washes, retaining walls, drainage crossings, community access routes, and evacuation routes; power, communications, fiber, cellular, and utility corridors; parks, public buildings, residential water systems, public landscapes, drainage-sensitive open areas, and structures in rugged terrain vulnerable to landslides, rockfall, debris flows, washout-related slope failure, roadway blockage, utility and water service interruption, isolation, delayed emergency response, and increased need for outside technical and financial assistance.

Problem Soils

Table 169 summarizes problem soils vulnerabilities and potential impacts for Washington County participants.

Table 169: Problem Soils Vulnerability and Impact Assessment for Washington County

Plan Participant	Vulnerabilities and Impacts
Washington County	**Vulnerabilities:** Washington County has problem-soil vulnerability associated with rapid population growth, high housing density, extensive urban and suburban development, and the widespread presence of expansive, collapsible, saline, shallow, and locally gypsiferous or erodible soils within the St. George–Hurricane urban corridor and surrounding communities. The county had 180,279 residents in 2020 and an estimated 213,670 residents in 2025, with about 69,786 households and 91,460 housing units, which provide countywide planning context rather than a mapped exposure count.

Plan Participant	Vulnerabilities and Impacts
	Vulnerability occurs where homes, schools, hospitals, roads, utilities, commercial centers, and public facilities are built on or adjacent to clay-rich alluvial deposits, alluvial fans, floodplain terraces, and basin-margin soils that can change significantly over short distances.[264] **Impacts:** Problem soils can cause foundation cracking, slab movement, wall distress, uneven floors, pavement cracking and rutting, curb and sidewalk displacement, culvert and drainage failure, and damage to buried water, wastewater, irrigation, and utility systems. Countywide impacts may include recurring maintenance burdens, water loss from pipe breaks, service interruption, higher construction and repair costs, business disruption, and long-term geotechnical and drainage needs as continued growth places more people and infrastructure in soil-sensitive areas. Critical facilities and infrastructure potentially impacted include Washington County Sheriff's Office; Washington County Emergency Management; St. George 911 Communications Center; Southwest Utah Public Health Department; St. George Regional Hospital; Washington County School District facilities; Utah Tech University facilities; Dixie Technical College facilities; county and municipal government buildings (111 E Tabernacle); public safety facilities; public works facilities; Interstate 15, State Route 9, State Route 18, State Route 34, State Route 7/Southern Parkway, State Route 59, and other regional roads, bridges, culverts, retaining walls, sidewalks, curb and gutter, drainage crossings, airport access routes, evacuation routes, and emergency response routes; St. George Regional Airport and supporting access and utility infrastructure; Washington County Water Conservancy District reservoirs, wells, pipelines, pump stations, water storage, treatment, and distribution infrastructure; municipal water, wastewater, stormwater, drainage, irrigation, power, communications, fiber, cellular, and utility systems; public works yards, schools, hospitals and clinics, commercial centers, residential neighborhoods, parks, trailheads, campgrounds, agricultural lands, irrigation infrastructure, visitor-serving facilities, and public buildings located on or adjacent to expansive, collapsible, saline, gypsiferous, shallow, rocky, erodible, karst-prone, alluvial fan, floodplain terrace, basin-margin, and clay-rich soils vulnerable to foundation cracking, slab movement, differential settlement, pavement cracking, sidewalk displacement, retaining wall distress, pipe breaks, utility misalignment, drainage failure, erosion, subsidence, sinkhole-like settlement, access disruption, recurring maintenance costs, and higher geotechnical design and repair needs.

[264] U.S. Census Bureau, QuickFacts: Washington County, Utah, V2025 population and housing estimates, 2020 Census, and 2020-2024 ACS. https://www.census.gov/quickfacts/fact/table/washingtoncountyutah/PST045225. Accessed October 9, 2026. Countywide totals are planning context, not mapped hazard exposure. Utah Geological Survey, Problem Soil and Rock Hazards. https://geology.utah.gov/hazards/problem-soils/. Source for general soil-hazard mechanisms; site-specific distribution and comparative ranking require supporting mapped analysis.

Plan Participant	Vulnerabilities and Impacts
St. George	**Vulnerabilities:** St. George is highly vulnerable because of its rapid growth, dense residential and commercial development, schools, medical facilities, roads, utilities, and public infrastructure built across clay-rich alluvial deposits, alluvial fans, and variable basin-margin soils. As the county's primary urban center, St. George contains the largest concentration of homes, businesses, and public facilities subject to expansive and collapsible soils, settlement, corrosive conditions, and pavement or drainage distress where moisture-sensitive soils are activated by irrigation, landscaping, leaking utilities, or stormwater infiltration. **Impacts:** Problem soils can crack foundations, slabs, roads, sidewalks, and retaining features; damage buried utilities and storm drainage; and increase construction, maintenance, and repair costs for homes, businesses, hospitals, schools, and city infrastructure. Because St. George is the county's principal service center, recurring soil-related failures can also disrupt transportation, utilities, public services, and regional commerce while creating long-term geotechnical and capital improvement needs. Critical facilities and infrastructure potentially impacted include St. George City Hall and municipal government facilities (61 S Main St.); St. George Police Department; St. George Fire Department stations (Fire Station #1 at 51 S 1000 E, Fire Station #8 at 1096 W Bluegrass way, Fire Station #3 at 2315 S River Rd); St. George 911 Communications Center; St. George Regional Hospital; Utah Tech University facilities; Dixie Technical College facilities; Washington County School District schools (East Elementary School at 453 South 600 East) and support facilities; St. George Regional Airport and airport access infrastructure; public works, water, wastewater, stormwater, irrigation, drainage, storage, pumping, treatment, and distribution facilities; Interstate 15, State Route 7/Southern Parkway, Bluff Street, River Road, St. George Boulevard, Riverside Drive, Red Hills Parkway, traffic signals, bridges, culverts, sidewalks, retaining walls, curb and gutter, and major arterials; Washington County Water Conservancy District facilities serving the St. George area; electric substations, overhead and underground power systems, communications, fiber, cellular, and utility infrastructure; hospitals, clinics, medical offices, commercial centers, hotels, warehouses, schools, parks, trail systems, golf courses, recreation facilities, public buildings, residential subdivisions, and bench or alluvial-fan development vulnerable to expansive clay movement, collapsible soil settlement, saline or corrosive soil effects, pavement and sidewalk cracking, foundation and slab distress, buried utility breaks, stormwater and drainage failure, airport access disruption, business interruption, and recurring infrastructure maintenance.[265]

[265] City of St. George, Contact the City, City Hall at 61 S. Main St. https://www.sgcityutah.gov/government/contact_the_city/index.php. Utah Tech University, institutional name-change announcement. https://news.utahtech.edu/2022/05/16/dixie-state-reveals-utah-tech-university-logos-in-preparation-for-july-1-name-change/. City Hall is not a university administration building.

Plan Participant	Vulnerabilities and Impacts
Washington City	**Vulnerabilities:** Washington City is vulnerable because growing neighborhoods, schools, parks, commercial areas, roads, utilities, and public facilities are built in the St. George urban corridor where expansive clays, collapsible alluvium, and variable alluvial-fan soils are widespread. Continued growth increases the number of homes, streets, sidewalks, and buried infrastructure potentially affected by shrink-swell movement, settlement, drainage limitations, and corrosive or low-strength subgrade conditions. **Impacts:** Problem soils can damage homes and community facilities through foundation cracking and uneven floors, deform pavement and sidewalks, and increase maintenance costs for roads, drainage systems, and utilities. Soil-related movement can also contribute to water line leaks, service interruption, and recurring repair needs that affect schools, city operations, and neighborhood access. Critical facilities and infrastructure potentially impacted include Washington City offices and municipal facilities (150 North 1100 East); Washington City Police Department; Washington City Fire Department facilities (250 Buena Vista Blvd); Washington County School District schools and community facilities; public works facilities; culinary water, irrigation, wastewater, stormwater, drainage, storage, pumping, treatment, and distribution infrastructure; Interstate 15, State Route 9, Telegraph Street, Green Spring Drive, Washington Parkway, bridges, culverts, sidewalks, curb and gutter, retaining walls, traffic-control devices, and major access routes; Washington County Water Conservancy District facilities serving the Washington area; power, communications, fiber, cellular, and utility infrastructure; parks, trail systems, sports fields, commercial centers, public buildings, residential neighborhoods, and developing areas located on valley-fill, alluvial fan, basin-margin, and clay-rich soils vulnerable to foundation movement, slab cracking, pavement distress, sidewalk displacement, utility line breaks, irrigation or stormwater leakage that worsens soil instability, drainage system damage, increased maintenance costs, and interrupted emergency access.
Hurricane	**Vulnerabilities:** Hurricane is highly vulnerable because expanding residential and commercial growth in the Hurricane Valley places more homes, schools, roads, utility systems, and public facilities on clay-rich alluvial deposits, alluvial fans, and variable basin-margin soils. Expansive and collapsible soils can affect neighborhoods, transportation corridors, and infrastructure where irrigation, landscaping, stormwater, or leaking utilities introduce moisture and trigger shrink-swell movement or settlement. **Impacts:** Problem soils can crack foundations and slabs, damage roads, curbs, sidewalks, drainage systems, and buried utilities, and increase repair and maintenance costs for public and private property. Soil instability may also interrupt traffic, school access, and utility service while creating long-term geotechnical and drainage challenges in fast-growing areas. Critical facilities and infrastructure potentially impacted include Hurricane City Hall and municipal facilities; Hurricane Police Department; Hurricane Valley Fire District facilities; Washington County School District schools (Hurricane Elementary

Plan Participant	Vulnerabilities and Impacts
	School at 948 West 325 North) and community facilities; public works, water, wastewater, stormwater, drainage, irrigation, storage, pumping, treatment, and distribution infrastructure; Interstate 15 access routes, State Route 9, State Route 7/Southern Parkway, State Route 59, local roads, bridges, culverts, sidewalks, retaining walls, drainage crossings, evacuation routes, and major local roads; Sand Hollow Reservoir and Quail Creek Reservoir recreation-support, dam, spillway, access, and utility infrastructure; power, communications, fiber, cellular, and utility corridors; parks, trailheads, campgrounds, marinas, commercial areas, tourism businesses, public buildings, residential subdivisions, and developing neighborhoods on alluvial fan, basin-margin, expansive, collapsible, saline, gypsiferous, shallow, rocky, or erodible soils vulnerable to foundation cracking, differential settlement, pavement and sidewalk damage, buried pipe failure, irrigation and drainage system movement, retaining wall distress, erosion, subsidence, road maintenance needs, utility interruption, recreation access disruption, and higher development or repair costs.
Santa Clara	**Vulnerabilities:** Santa Clara is vulnerable where homes, schools, parks, community facilities, roads, and utility systems are located on expansive, collapsible, and shallow alluvial-fan soils within the greater St. George urban area. Moisture-sensitive soils beneath residential neighborhoods and public infrastructure can shift with irrigation, landscaping, leaking utilities, and wet-dry cycles, increasing exposure to foundation distress and infrastructure damage. **Impacts:** Problem soils can cause cracking and movement in homes, public buildings, sidewalks, roads, and buried utilities; increase drainage and maintenance problems; and raise long-term repair costs for residents and the city. Repeated soil-related damage may also affect park facilities, water and sewer systems, and neighborhood access where underlying soils remain unstable. Critical facilities and infrastructure potentially impacted include Santa Clara City Hall and municipal facilities; Santa Clara-Ivins Police Department facilities; Santa Clara fire (2771 Circle Dr) and emergency response facilities; Washington County School District schools and community facilities; public works, water, irrigation, wastewater, stormwater, drainage, storage, pumping, treatment, and distribution systems; Old Highway 91, Santa Clara Drive, Pioneer Parkway, local roads, bridges, culverts, sidewalks, retaining walls, curb and gutter, drainage crossings, and emergency routes; Santa Clara River corridor infrastructure; power, communications, fiber, cellular, and utility infrastructure; parks, trails, recreation areas, public buildings, commercial areas, neighborhoods, and slope- or terrace-adjacent development located on alluvial deposits, river terraces, clay-rich soils, collapsible soils, saline soils, erodible soils, and locally unstable fill vulnerable to foundation and slab movement, pavement cracking, sidewalk displacement, utility breaks, drainage and irrigation leakage, retaining wall damage, erosion, soil collapse, increased public works maintenance, and recurring repair needs.

Plan Participant	Vulnerabilities and Impacts
Ivins	**Vulnerabilities:** Ivins is vulnerable because homes, roads, parks, public facilities, tourism-related amenities, and utility systems are built on or adjacent to expansive, collapsible, shallow, and variable alluvial-fan soils within the St. George urban corridor. Ivins shares county exposure where continued growth places more structures and buried infrastructure on moisture-sensitive soils affected by irrigation, landscaping, leaking utilities, and wet-dry cycles. The hazard profile also notes that soil expansion impacts range from very low to very high under the Soil Expansion Index, with very high expansion occurring above 130. **Impacts:** Problem soils can crack foundations, slabs, sidewalks, roads, and retaining features; damage buried utilities and drainage systems; and increase maintenance costs for homes, public buildings, tourism amenities, and city infrastructure. Soil movement and settlement may also interrupt roadway access, contribute to water loss from pipe breaks, and create long-term geotechnical, drainage, and capital improvement needs where variable soils remain unstable. Critical facilities and infrastructure potentially impacted include Ivins City Hall and municipal facilities; Santa Clara-Ivins Police Department facilities serving Ivins; Ivins fire and emergency response facilities; Washington County School District schools and community facilities; public works, water, wastewater, stormwater, drainage, irrigation, storage, pumping, treatment, and distribution infrastructure; Old Highway 91, Center Street, Snow Canyon Parkway, local access routes, bridges, culverts, sidewalks, retaining walls, drainage crossings, and emergency routes; overhead and underground power, communications, fiber, cellular, and utility infrastructure; parks, trailheads, recreation facilities, public buildings, tourism-related amenities, residential neighborhoods, and desert-edge development near alluvial fans, slope transitions, clay-rich deposits, shallow rocky soils, erodible soils, and collapsible soils vulnerable to foundation settlement, slab and wall cracking, pavement distress, utility misalignment, irrigation or stormwater-related soil movement, retaining wall distress, drainage failure, erosion, service disruption, and increased geotechnical and maintenance needs.
La Verkin	**Vulnerabilities:** La Verkin is vulnerable because homes, schools, roads, bridges, parks, businesses, utilities, and public facilities are built in a corridor setting where expansive, collapsible, saline, and variable alluvial soils can affect foundations, pavements, and buried infrastructure. As part of Washington County, which had an estimated 213,670 residents and 91,460 housing units in 2025, La Verkin shares regional exposure to clay-rich alluvial deposits and basin-margin soils that can change over short distances and react to irrigation, landscaping, leaking utilities, and stormwater infiltration. **Impacts:** Problem soils can cause foundation cracking, slab movement, pavement rutting, sidewalk displacement, drainage problems, and damage to buried water, wastewater, and utility lines. Soil-related failures may also affect corridor travel, increase maintenance costs for roads and public facilities, and create recurring repair needs where moisture-sensitive soils continue to settle or shrink and swell over time. Critical facilities and infrastructure potentially

Plan Participant	Vulnerabilities and Impacts
	impacted include La Verkin City offices and municipal facilities; La Verkin Police Department; La Verkin fire and emergency response facilities (Hurricane Valley Fire District Station 43 at 305 N Main St); Washington County School District schools and community facilities; public works, water, wastewater, stormwater, drainage, storage, pumping, treatment, and utility infrastructure; State Route 9, State Route 17, local roads, bridges, culverts, sidewalks, retaining walls, drainage crossings, evacuation routes, and Zion gateway access routes; La Verkin Creek, Ash Creek, Virgin River corridor, and adjacent terrace or slope infrastructure; overhead and underground electric, communications, fiber, cellular, and utility infrastructure; parks, trailheads, visitor-serving businesses, public buildings, neighborhoods, and river-, terrace-, or slope-adjacent facilities vulnerable to expansive or collapsible soil movement, foundation cracking, settlement, pavement damage, buried utility breaks, culvert and drainage failure, retaining wall movement, erosion, corrosive or saline soil effects, access disruption, and increased public works repair needs.
Enterprise	**Vulnerabilities:** Enterprise is vulnerable where homes, schools, agricultural buildings, corrals, local businesses, roads, utility systems, and farm infrastructure are located on or near valley-bottom, alluvial, shallow, or moisture-sensitive soils that can settle, crack, erode, or lose bearing strength when wet. Although smaller than the urban corridor communities, Enterprise shares Washington County's broader problem-soils setting and may face higher consequences where local roads, water systems, and agricultural support facilities have limited redundancy and are affected by expansive, saline, shallow, or collapsible soils. **Impacts:** Problem soils can crack foundations and slabs, damage roads, culverts, water lines, septic or irrigation systems, and create uneven pads or drainage problems for agricultural structures and equipment areas. Recovery may be prolonged where local staffing and budgets are limited, and repeated soil-related failures can increase long-term maintenance costs for both municipal infrastructure and agricultural operations. Critical facilities and infrastructure potentially impacted include Enterprise City offices and municipal facilities; Enterprise Police Department; Enterprise fire and emergency response facilities; Washington County School District schools and community facilities; public works, municipal and domestic water systems, wells, wastewater, drainage, stormwater, irrigation, storage, pumping, treatment, and agricultural water infrastructure; State Route 18, local roads, bridges, culverts, sidewalks, drainage crossings, rural access routes, and emergency routes; reservoirs, irrigation systems, canals, storage ponds, farms, ranches, barns, corrals, fields, livestock water supplies, and agricultural support facilities; power, communications, fiber, cellular, and utility infrastructure; parks, public buildings, maintenance yards, and rural development located on valley-fill, alluvial, saline, collapsible, expansive, shallow, rocky, or erodible soils vulnerable to foundation settlement, slab cracking, pavement failure, culvert misalignment, canal or irrigation leakage,

Plan Participant	Vulnerabilities and Impacts
	pipe breaks, drainage failure, erosion, road shoulder instability, agricultural infrastructure damage, utility interruption, delayed emergency response, and higher repair costs in a rural setting.
Toquerville	**Vulnerabilities:** Toquerville is vulnerable because growing residential areas, roads, utility systems, parks, and public facilities are being developed in an arid environment where expansive, collapsible, shallow, and variable alluvial soils can affect foundations, pavements, and buried infrastructure. Continued growth increases the number of homes, streets, and utility corridors that may be affected by shrink-swell movement, settlement, drainage limitations, and moisture-sensitive subgrades within Washington County's extensive problem-soils setting. **Impacts:** Problem soils can damage homes and public facilities through foundation cracking and uneven floors, deform roads, curbs, and sidewalks, and contribute to drainage and utility failures. Soil-related movement may also increase maintenance costs, affect neighborhood access, and require recurring geotechnical investigation, drainage improvements, and infrastructure repair as development expands. Critical facilities and infrastructure potentially impacted include Toquerville Town Hall and municipal facilities; Toquerville fire and emergency response facilities; public works and utility facilities; Washington County School District schools and community facilities serving the area; culinary water, irrigation, wastewater, stormwater, drainage, storage, pumping, treatment, and distribution infrastructure; State Route 17, Interstate 15 access routes, local roads, bridges, culverts, sidewalks, retaining walls, drainage crossings, evacuation routes, and developing neighborhood access roads; Ash Creek and La Verkin Creek watershed drainage infrastructure; power, communications, fiber, cellular, and utility infrastructure; parks, trails, public buildings, visitor-serving facilities, and neighborhoods near benches, alluvial fans, drainage corridors, basin-margin soils, clay-rich deposits, collapsible soils, and erodible terrain vulnerable to foundation movement, differential settlement, pavement and sidewalk cracking, buried utility breaks, irrigation or drainage leakage, culvert and stormwater system damage, retaining wall distress, soil collapse, erosion, neighborhood access disruption, and increased maintenance costs.
Leeds	**Vulnerabilities:** Leeds is vulnerable where homes, Interstate 15 access points, local roads, utility systems, and community facilities are located on or near shallow, rocky, erodible, expansive, or variable soils in a geologically constrained setting. The town's position near major transportation corridors and limited local infrastructure means even localized soil-related damage can affect roadway performance, drainage, utilities, and access, especially where subgrades are weak or moisture-sensitive.

Plan Participant	Vulnerabilities and Impacts
	Impacts: Problem soils can crack foundations and pavements, damage culverts and utility lines, reduce roadway and shoulder stability, and increase maintenance costs for roads and public facilities. Because of Leeds' connection to a major regional corridor, localized soil failures may also create wider transportation and safety consequences and require repeated repair or engineered stabilization. Critical facilities and infrastructure potentially impacted include Leeds Town Hall and public works facilities; Leeds fire and emergency response facilities; water, wastewater, stormwater, drainage, storage, pumping, treatment, and utility infrastructure; Interstate 15, Main Street, local roads, bridges, culverts, sidewalks, retaining walls, access ramps, drainage crossings, evacuation routes, and corridor transportation infrastructure; Leeds Creek, Quail Creek, and nearby drainage corridor infrastructure; overhead and underground electric, communications, fiber, cellular, and utility infrastructure; parks, public buildings, community facilities, and corridor-related development near steep slopes, shallow rocky soils, erodible soils, alluvial deposits, clay-rich soils, and drainage-sensitive terrain vulnerable to foundation settlement, pavement distress, bridge approach movement, culvert misalignment, utility breaks, drainage failure, erosion, retaining wall damage, interstate access disruption, service interruption, and delayed emergency response.
Virgin	**Vulnerabilities:** Virgin is vulnerable because homes, lodging, restaurants, roads, utilities, and visitor-serving businesses in the Zion gateway corridor may be built on variable alluvial, shallow, erodible, or moisture-sensitive soils that can affect foundations, roads, and buried infrastructure. The town's small size, heavy visitor use, and limited transportation and utility redundancy increase exposure where soil-related distress affects SR-9 access, drainage, or service reliability. **Impacts:** Problem soils can crack foundations, damage pavement and drainage systems, distort sidewalks and utility lines, and create recurring repair costs for businesses, residences, and corridor infrastructure. Even localized soil failures can disrupt visitor access, local commerce, and emergency response because the town depends on limited infrastructure and a single primary travel corridor. Critical facilities and infrastructure potentially impacted include Virgin Town Hall and municipal facilities; Virgin fire and emergency response facilities; public works, water, wastewater, drainage, storage, pumping, treatment, and utility infrastructure; State Route 9, local roads, bridges, culverts, sidewalks, retaining walls, drainage crossings, evacuation routes, and Zion gateway access routes; Virgin River corridor and adjacent terrace, alluvial fan, and slope infrastructure; overhead and underground electric, communications, fiber, cellular, and utility corridors; lodging, restaurants, visitor-serving businesses, parks, trailheads, campgrounds, recreation access points, public buildings, residential areas, and tourism-related facilities located on or near collapsible, expansive, saline, shallow, rocky, erodible, floodplain terrace, and basin-margin soils vulnerable to foundation and slab cracking, differential settlement, pavement distress,

Plan Participant	Vulnerabilities and Impacts
	buried utility failure, septic or wastewater limitations, drainage and irrigation-related soil movement, erosion, SR-9 access disruption, visitor service interruption, and recurring repair costs.
Springdale	**Vulnerabilities:** Springdale is vulnerable because hotels, restaurants, homes, employee housing, roads, utilities, and visitor facilities in the Zion gateway corridor may be built on variable alluvial, shallow, rocky, or erosion-prone soils that complicate construction and increase maintenance needs. Although Springdale is a much smaller community than the urban corridor, it shares Washington County's broader problem-soils setting and has added exposure because development is concentrated in a narrow corridor with limited transportation redundancy and high seasonal visitation. **Impacts:** Problem soils can crack foundations, damage roads, curbs, sidewalks, retaining features, and buried utilities, and increase costs for maintaining lodging, restaurants, public facilities, and corridor infrastructure. Even localized soil-related damage can disrupt tourism, visitor circulation, and emergency access because the town depends on limited transportation capacity and uninterrupted operation of visitor-serving businesses. Critical facilities and infrastructure potentially impacted include Springdale Town Hall (118 Lion Blvd) and municipal facilities; Springdale Police Department and emergency response facilities (Rockville/Springdale Fire Station at 1130 Zion Park Blvd, 188 W. Main); public works, water, wastewater, drainage, stormwater, storage, pumping, treatment, and utility infrastructure; State Route 9, Zion Canyon access routes, shuttle-related transportation facilities, local roads, bridges, culverts, sidewalks, retaining walls, drainage crossings, evacuation routes, and visitor access corridors; Virgin River corridor and canyon-slope infrastructure; overhead and underground electric, communications, fiber, cellular, and utility infrastructure; hotels, restaurants, lodging areas, employee housing, visitor facilities, parks, trailheads, public buildings, Zion gateway recreation assets, and public gathering areas in narrow canyon, terrace, slope, alluvial, collapsible, shallow, rocky, erodible, and drainage-sensitive soil settings vulnerable to foundation settlement, slab and wall cracking, pavement failure, retaining wall distress, buried utility and wastewater system damage, drainage failure, erosion, access disruption, visitor service disruption, and higher geotechnical design, maintenance, and repair costs.
New Harmony	**Vulnerabilities:** New Harmony is vulnerable where homes, roads, water infrastructure, agricultural lands, and community facilities are located on shallow, rocky, erodible, or variable mountain-valley soils that can limit excavation, reduce bearing capacity, and complicate drainage and utility installation. Its rural setting and limited alternate access can increase the consequences of localized soil-related damage where roads, water systems, or building sites are affected by erosion, settlement, or moisture-sensitive subgrades. **Impacts:** Problem soils can crack foundations, damage roads, culverts, and water infrastructure, affect septic and drainage performance, and increase

Plan Participant	Vulnerabilities and Impacts
	costs for site preparation and long-term maintenance. Recovery may be slower where staffing and resources are limited and where repeated repairs or engineering solutions are needed to maintain access and service reliability. Critical facilities and infrastructure potentially impacted include New Harmony Town Hall and municipal facilities; fire and emergency response facilities (Fire Station #1 at 133 E Center St, Fire Station #2 at 1388 S Old Hwy 91); public works, local and domestic water systems, wells, storage, pumping, wastewater, drainage, and utility infrastructure; Interstate 15, State Route 144, local roads, bridges, culverts, sidewalks, retaining walls, drainage crossings, evacuation routes, and rural access roads; Ash Creek watershed drainage crossings and nearby slope, valley-fill, and alluvial infrastructure; power, communications, fiber, cellular, and utility corridors; agricultural and open lands, irrigation systems, livestock water supplies, parks, community facilities, public buildings, public landscapes, and rural development near mountain-valley soils, shallow bedrock, erodible slopes, alluvial deposits, collapsible soils, and drainage-sensitive terrain vulnerable to foundation settlement, pavement cracking, pipe breaks, culvert and drainage misalignment, erosion, shallow bedrock excavation constraints, septic or wastewater limitations, utility interruption, isolation, and delayed emergency response.
Rockville	**Vulnerabilities:** Rockville is vulnerable because its small historic and residential development pattern along the Virgin River corridor includes homes, roads, utilities, public spaces, and historic resources that may be affected by shallow, variable, erosion-prone, or moisture-sensitive soils. Older structures and limited infrastructure redundancy increase sensitivity where foundations, roadbeds, and buried utilities are placed on soils that respond poorly to moisture changes, runoff, or constrained site conditions. **Impacts:** Problem soils can crack foundations, damage historic resources, roads, sidewalks, and utilities, and increase costs for maintenance, drainage improvements, and engineered site stabilization. Because Rockville is small and access is limited, even localized soil-related failures can disrupt community function, visitor access, and long-term preservation of historic and public assets. Critical facilities and infrastructure potentially impacted include Rockville Town Hall and municipal facilities; fire and emergency response facilities (Rockville/Springdale Fire Station at 1130 Zion Park Blvd); public works, water, wastewater, drainage, storage, pumping, treatment, and utility infrastructure; State Route 9, local roads, bridges, culverts, sidewalks, retaining walls, drainage crossings, evacuation routes, and Zion gateway access routes; Virgin River corridor and adjacent terrace, slope, and canyon infrastructure; overhead and underground electric, communications, fiber, cellular, and utility infrastructure; historic buildings, homes, parks, trailheads, visitor-serving facilities, public buildings, public spaces, and scenic or historic community resources located on or near alluvial, river terrace, shallow, rocky, erodible, collapsible, expansive, and drainage-sensitive soils vulnerable to foundation and wall cracking, slab movement, pavement distress, buried utility breaks, septic or wastewater limitations, drainage failure, erosion, retaining wall

Plan Participant	Vulnerabilities and Impacts
	movement, constrained emergency access, visitor disruption, and higher maintenance costs for historic and community assets.
Apple Valley	**Vulnerabilities:** Apple Valley is vulnerable where dispersed residential development, local roads, drainage crossings, water infrastructure, and utility systems are built on variable alluvial, shallow, erodible, or moisture-sensitive soils in a rural-residential setting. The town's dispersed layout and modest infrastructure systems increase exposure where settlement, cracking, poor drainage, or low-strength subgrades affect roads, homes, or buried utilities. **Impacts:** Problem soils can damage foundations, roads, culverts, water lines, septic or drainage systems, and increase maintenance costs for homes and community infrastructure. Recovery may be challenging if multiple dispersed neighborhoods experience recurring soil-related failures at once or if repairs require outside geotechnical and construction support. Critical facilities and infrastructure potentially impacted include Apple Valley Town Hall and municipal facilities; fire and emergency response facilities; public works, community water systems, wells, storage, pumping, wastewater, drainage, and utility infrastructure; State Route 59, local roads, bridges, culverts, washes, sidewalks, retaining walls, drainage crossings, evacuation routes, and rural access roads; power, communications, fiber, cellular, and utility corridors; parks, community facilities, dispersed residential water systems, public buildings, open-space resources, limited agricultural or livestock support infrastructure, maintenance facilities, and rural-residential development located on alluvial fan, basin-margin, shallow, rocky, erodible, collapsible, expansive, saline, or drainage-sensitive soils vulnerable to foundation settlement, slab cracking, pavement and road shoulder damage, culvert misalignment, pipe breaks, septic or wastewater limitations, erosion, utility disruption, delayed emergency access, and repair challenges across dispersed neighborhoods.
Hildale	**Vulnerabilities:** Hildale is vulnerable where homes, schools, roads, utility and water systems, and public facilities are located on variable, shallow, erodible, or moisture-sensitive soils in a rugged terrain setting with ongoing infrastructure needs. Limited infrastructure redundancy increases exposure where foundation movement, roadway distress, drainage problems, or utility instability occur on poor or changing subgrades.

Plan Participant	Vulnerabilities and Impacts
	Impacts: Problem soils can crack foundations, damage roads, sidewalks, culverts, water and utility infrastructure, and increase maintenance and repair demands for public facilities and neighborhoods. In a community with significant infrastructure needs, repeated soil-related failures may require outside technical and financial assistance and can prolong disruption to services, access, and public safety operations. Critical facilities and infrastructure potentially impacted include Hildale City Hall and municipal facilities; Hildale Police Department; Hildale fire and emergency response facilities; Water Canyon School and other community facilities; public works, culinary water, wastewater, stormwater, drainage, storage, pumping, treatment, and utility infrastructure; Utah State Route 59, local roads, bridges, culverts, washes, sidewalks, retaining walls, drainage crossings, community access routes, and evacuation routes; power, communications, fiber, cellular, and utility corridors; parks, public buildings, residential water systems, public landscapes, drainage-sensitive open areas, and structures in rugged terrain located on or near shallow, rocky, erodible, collapsible, expansive, saline, alluvial fan, and drainage-sensitive soils vulnerable to foundation and slab movement, pavement distress, pipe breaks, drainage and stormwater failure, culvert misalignment, erosion, utility and water service interruption, road damage, isolation, delayed emergency response, and increased need for outside technical and financial assistance.

Radon Gas

Table 170 summarizes radon vulnerabilities and potential impacts for Washington County participants.

Table 170: Radon Gas Vulnerability and Impact Assessment for Washington County

Plan Participant	Vulnerabilities and Impacts
Washington County	**Vulnerabilities:** Washington County is vulnerable to radon exposure because radon can accumulate in any occupied ground-contact structure where gas migrates from soil and rock into indoor spaces. The county is classified by EPA as Zone 2, with predicted average indoor screening levels between 2 and 4 pCi/L. Vulnerable assets include homes, apartments, schools, childcare facilities, health care and assisted living facilities, government buildings, commercial buildings, and lodging. Vulnerability is increased by rapid population growth, high housing density, and continued residential and commercial development in and around St. George, Washington, Hurricane, Santa Clara, and other communities, especially where buildings have

Plan Participant	Vulnerabilities and Impacts
	basements, crawlspaces, slab-on-grade construction, foundation cracks, utility penetrations, or limited ventilation.[266][267][268] **Impacts:** Radon does not cause visible structural damage, but long-term indoor exposure significantly increases lung cancer risk. The profile notes that radon is the second leading cause of lung cancer in the United States, the leading cause among nonsmokers, and is associated with about 21,000 lung cancer deaths nationally each year. EPA recommends mitigation at or above 4 pCi/L and suggests considering mitigation at 2.0–3.9 pCi/L. Countywide impacts therefore include chronic public health risk, testing and mitigation costs, potential delays in property transfers or facility use, and increased operational burdens for schools, health care facilities, local governments, and property owners if elevated levels are identified.[269][270] Critical facilities and infrastructure potentially impacted include Washington County Sheriff's Office; Washington County Emergency Management; St. George 911 Communications Center; Southwest Utah Public Health Department; St. George Regional Hospital; Washington County School District facilities; Utah Tech University facilities; Dixie Technical College facilities; county and municipal government buildings; public safety facilities; public works facilities; health care, assisted living, childcare, school, library, senior center, community center, emergency operations, and public-facing government buildings; homes, apartments, multifamily housing, rental units, employee housing, lodging, commercial buildings, offices, and other frequently occupied ground-contact structures; public health outreach systems, building inspection and permitting programs, property management systems, real estate transaction processes, facility maintenance programs, and radon testing and mitigation contractor networks vulnerable to elevated indoor radon concentrations, long-term occupant exposure, testing and follow-up testing needs, mitigation costs, delayed occupancy or property transfers, facility management burdens, communication needs, and disproportionate impacts for lower-income households, renters, older buildings, and structures without radon-resistant construction or adequate ventilation.
St. George	**Vulnerabilities:** St. George is highly vulnerable because radon can accumulate in any occupied ground-contact structure, and the city contains the county's largest concentration of homes, apartments, schools, childcare facilities, hospitals, offices, government buildings, lodging, and other

[266] EPA = U.S. Environmental Protection Agency
[267] pCi/L = picocuries per liter
[268] U.S. Environmental Protection Agency, Utah Map of Radon Zones (map developed in 1993). https://www.epa.gov/sites/default/files/2014-08/documents/utah.pdf. County zones do not predict individual-building levels; all homes should be tested.
[269] DEQ = Department of Environmental Quality
[270] U.S. Environmental Protection Agency, What is EPA's Action Level for Radon and What Does it Mean? https://www.epa.gov/radon/what-epas-action-level-radon-and-what-does-it-mean. Utah Department of Environmental Quality, Radon Program. https://deq.utah.gov/dwmrc/radon. Sources for action levels and the statewide one-in-three statistic; local test counts and building-specific costs require separate records.

Plan Participant	Vulnerabilities and Impacts
	frequently occupied buildings. Washington County is classified as EPA Zone 2, with predicted average indoor screening levels between 2 and 4 pCi/L. Rapid development, multifamily housing, older structures, and continued expansion into previously untested areas increase the number of buildings that may contain elevated radon if testing and radon-resistant construction are not consistently applied. **Impacts:** Radon creates chronic rather than sudden impacts, but long-term exposure can significantly increase lung cancer risk for residents, students, workers, patients, and visitors. EPA recommends mitigation at or above 4 pCi/L; mitigation costs vary with building and system design. In St. George, elevated radon could affect households and public-serving facilities where testing identifies elevated levels, create testing and mitigation costs for property owners and institutions, and complicate occupancy, leasing, property transfer, or facility management decisions if high indoor levels are identified. Critical facilities and infrastructure potentially impacted include St. George City Hall and municipal government facilities; St. George Police Department; St. George Fire Department stations; St. George 911 Communications Center; St. George Regional Hospital; Utah Tech University facilities; Dixie Technical College facilities; Washington County School District schools and support facilities; health care, assisted living, childcare, school, library, senior center, community center, emergency operations, and public-facing municipal buildings; homes, apartments, multifamily housing, rental units, employee housing, lodging, hotels, offices, commercial centers, medical offices, public buildings, and other frequently occupied ground-contact structures; building inspection and permitting programs, property management systems, real estate transaction processes, facility maintenance programs, public health education systems, and radon testing and mitigation contractor networks vulnerable to elevated indoor radon, cumulative lung cancer risk, testing and mitigation expenses, delayed leasing or property transfers, facility use decisions, tenant and occupant communication needs, and increased operational burdens in the county's largest residential, medical, education, lodging, and commercial center.
Washington City	**Vulnerabilities:** Washington City is vulnerable because radon can accumulate in homes, schools, childcare facilities, public buildings, and commercial spaces with direct ground contact, including slab-on-grade buildings, basements, crawlspaces, and structures with cracks or utility penetrations. As part of Washington County, the city shares the county's EPA Zone 2 classification and moderate predicted indoor screening range of 2 to 4 pCi/L, and continued residential growth increases the number of occupied buildings that may not yet have been tested or mitigated. **Impacts:** Radon can create long-term public health consequences by increasing lung cancer risk for residents, students, employees, and other building occupants, even when no visible warning signs are present. Because EPA recommends mitigation at or above 4 pCi/L, Washington City may face ongoing testing and mitigation costs, property management and disclosure

Plan Participant	Vulnerabilities and Impacts
	issues, and operational burdens for schools or public facilities if elevated indoor radon levels are found. Critical facilities and infrastructure potentially impacted include Washington City offices and municipal facilities; Washington City Police Department; Washington City Fire Department facilities; Washington County School District schools and community facilities; public works and public-facing municipal buildings; homes, apartments, multifamily housing, rental units, childcare facilities, schools, libraries, senior or community centers, commercial buildings, offices, lodging or short-term rental units, and other occupied ground-contact structures; building inspection and permitting programs, code enforcement and development review processes, property management systems, real estate transaction processes, facility maintenance programs, public health outreach systems, and radon testing and mitigation contractor networks vulnerable to elevated indoor radon concentrations, chronic occupant exposure, testing and mitigation costs, delayed occupancy, property disclosure or transfer issues, public education needs, and increased exposure as residential and commercial growth continues.
Hurricane	**Vulnerabilities:** Hurricane is vulnerable because radon can accumulate in any occupied ground-contact structure, including homes, schools, childcare facilities, businesses, public buildings, and lodging or rental units. The city shares Washington County's EPA Zone 2 classification, with predicted average indoor screening levels between 2 and 4 pCi/L, and continued residential and commercial growth expands the number of structures that may expose occupants if site-specific testing and mitigation are not completed. **Impacts:** Radon does not damage buildings directly, but prolonged exposure can increase long-term lung cancer risk for residents, students, workers, and visitors, especially in untested or poorly ventilated buildings. Elevated levels may also require follow-up testing and mitigation, and can create indirect burdens on homeowners, landlords, schools, and public agencies through added expense, occupancy concerns, and delayed corrective action. Critical facilities and infrastructure potentially impacted include Hurricane City Hall and municipal facilities; Hurricane Police Department; Hurricane Valley Fire District facilities; Washington County School District schools and community facilities; public works and public-facing municipal buildings; homes, apartments, rental units, childcare facilities, schools, libraries, senior or community centers, lodging, short-term rentals, commercial buildings, offices, recreation-support buildings, and other occupied ground-contact structures; building inspection and permitting programs, development review processes, property management systems, real estate transaction processes, facility maintenance programs, public health outreach systems, and radon testing and mitigation contractor networks vulnerable to elevated indoor radon, long-term occupant exposure, testing and mitigation expenses, property transfer or leasing delays, facility management burdens, occupant communication needs, and increased exposure as housing, recreation-related development, and visitor-serving uses expand.

Plan Participant	Vulnerabilities and Impacts
Santa Clara	**Vulnerabilities:** Santa Clara is vulnerable because radon can collect in homes, schools, parks buildings, community facilities, and other enclosed ground-contact structures in the greater St. George urban area. As part of Washington County, Santa Clara is within EPA Zone 2 with predicted average indoor screening levels between 2 and 4 pCi/L, and older buildings, slab-on-grade construction, crawlspaces, and limited ventilation can increase exposure if structures are not tested and mitigated. **Impacts:** Radon primarily affects human health by increasing cumulative lung cancer risk over time, especially for residents, children, older adults, smokers, and occupants of buildings that remain untested. If elevated indoor concentrations are found at or above EPA's 4 pCi/L action level, the city and property owners may face costs for testing, mitigation, and communication, as well as possible delays in property transfers or facility use until corrective actions are completed. Critical facilities and infrastructure potentially impacted include Santa Clara City Hall and municipal facilities; Santa Clara-Ivins Police Department facilities; Santa Clara fire and emergency response facilities; Washington County School District schools and community facilities; public works and public-facing municipal buildings; homes, apartments, rental units, childcare facilities, schools, libraries, senior or community centers, commercial buildings, offices, public buildings, lodging or short-term rental units, and other occupied ground-contact structures; building inspection and permitting programs, development review processes, property management systems, real estate transaction processes, facility maintenance programs, public health education systems, and radon testing and mitigation contractor networks vulnerable to elevated indoor radon, chronic health risk for building occupants, testing and mitigation expenses, delayed occupancy or property transfers, communication needs for residents and tenants, and facility management burdens where elevated indoor concentrations are identified.
Ivins	**Vulnerabilities:** Ivins is vulnerable because radon can accumulate in homes, public facilities, tourism-related buildings, and other enclosed structures with direct soil contact, including slab-on-grade and crawlspace construction common in expanding neighborhoods. The city shares Washington County's EPA Zone 2 classification and moderate predicted indoor screening levels of 2 to 4 pCi/L, and continued growth in residential and visitor-serving development increases the number of buildings that may require testing and mitigation. **Impacts:** Long-term exposure to indoor radon can increase lung cancer risk for residents, workers, and visitors even though there are no visible signs of the hazard. Elevated results can also generate testing and mitigation costs, and may affect occupancy decisions, property transactions, or facility management if mitigation is delayed. Critical facilities and infrastructure potentially impacted include Ivins City Hall and municipal facilities; Santa Clara-Ivins Police Department facilities serving Ivins; Ivins fire and emergency response facilities; Washington County School District schools and community facilities; public works and public-facing municipal buildings; homes,

Plan Participant	Vulnerabilities and Impacts
	apartments, rental units, childcare facilities, schools, libraries, senior or community centers, medical or assisted living facilities, tourism-related buildings, lodging, offices, commercial buildings, and other frequently occupied ground-contact structures; building inspection and permitting programs, development review processes, property management systems, real estate transaction processes, facility maintenance programs, public health outreach systems, and radon testing and mitigation contractor networks vulnerable to elevated indoor radon, long-term occupant exposure, testing and mitigation costs, property transfer or leasing delays, facility management burdens, and communication needs for residents, visitors, students, workers, and other occupants.
La Verkin	**Vulnerabilities:** La Verkin is vulnerable because radon can build up in homes, schools, public facilities, and commercial buildings with basements, crawlspaces, slab-on-grade construction, or other direct soil contact in a community where continued growth adds new occupied structures. As part of Washington County, La Verkin shares the county's EPA Zone 2 classification and moderate predicted indoor radon range of 2 to 4 pCi/L, but site-specific levels may exceed that range and cannot be identified without testing. **Impacts:** Radon can create chronic health consequences through long-term exposure, increasing lung cancer risk for residents, students, workers, and people spending extended time indoors. Elevated indoor levels may also require mitigation at or above EPA's 4 pCi/L action level, adding costs for homeowners and public agencies and potentially complicating property transfers, school operations, or building management if corrective action is delayed. Critical facilities and infrastructure potentially impacted include La Verkin City offices and municipal facilities; La Verkin Police Department; La Verkin fire and emergency response facilities; Washington County School District schools and community facilities; public works and public-facing municipal buildings; homes, apartments, rental units, childcare facilities, schools, libraries, senior or community centers, lodging, short-term rentals, visitor-serving businesses, offices, commercial buildings, and other occupied ground-contact structures; building inspection and permitting programs, development review processes, property management systems, real estate transaction processes, facility maintenance programs, public health outreach systems, and radon testing and mitigation contractor networks vulnerable to elevated indoor radon, chronic occupant exposure, testing and mitigation expenses, delayed property transfers or occupancy decisions, tenant and visitor communication needs, and operational burdens for public and visitor-serving facilities.
Enterprise	**Vulnerabilities:** Enterprise is vulnerable because radon can accumulate in homes, schools, agricultural support buildings used regularly by workers, public buildings, and other enclosed structures with direct soil contact in a rural community where testing and mitigation services may be less accessible. Although smaller than the urban corridor communities, Enterprise still shares Washington County's EPA Zone 2 classification and moderate predicted

Plan Participant	Vulnerabilities and Impacts
	indoor screening range of 2 to 4 pCi/L, and rural settlement patterns can prolong exposure where buildings remain untested for long periods. **Impacts:** Radon exposure can increase long-term lung cancer risk for residents, students, workers, and other occupants of frequently used buildings, particularly where the hazard remains undetected. Indirect impacts may include the cost of testing and mitigation, potential delays in home sales or occupancy decisions, and added burdens on households or public facilities if mitigation is needed and outside contractors must travel to the community. Critical facilities and infrastructure potentially impacted include Enterprise City offices and municipal facilities; Enterprise Police Department; Enterprise fire and emergency response facilities; Washington County School District schools and community facilities; public works and public-facing municipal buildings; homes, rental units, childcare facilities, schools, libraries, senior or community centers, agricultural support offices, commercial buildings, local businesses, public buildings, and other occupied ground-contact structures; rural housing, older buildings, dispersed properties, building inspection and permitting programs, property management systems, real estate transaction processes, facility maintenance programs, public health outreach systems, and radon testing and mitigation contractor networks vulnerable to elevated indoor radon, long-term occupant exposure, testing and mitigation costs, delayed property transfers, limited local contractor availability, communication challenges, and disproportionate burdens for lower-income households, renters, older structures, and dispersed rural properties.
Toquerville	**Vulnerabilities:** Toquerville is vulnerable because radon can occur in homes, schools, public buildings, and other occupied structures with direct ground contact as development continues in an arid, expanding residential setting. Like the rest of Washington County, Toquerville is in EPA Zone 2 with predicted average indoor screening levels between 2 and 4 pCi/L, but the hazard is site-specific and can exceed those averages where buildings are untested or have poor ventilation. **Impacts:** Radon creates long-term health impacts by increasing cumulative lung cancer risk for occupants of untested buildings, even though no immediate symptoms or visible damage occur. If elevated levels are identified, property owners and local facilities may face testing and mitigation expenses, along with added planning and communication needs to reduce exposure. Critical facilities and infrastructure potentially impacted include Toquerville Town Hall and municipal facilities; Toquerville fire and emergency response facilities; public works and public-facing municipal buildings; Washington County School District schools and community facilities serving the area; homes, apartments, rental units, childcare facilities, schools, libraries, senior or community centers, commercial buildings, visitor-serving facilities, offices, and other occupied ground-contact structures; building inspection and permitting programs, development review processes, property management systems, real estate transaction processes, facility maintenance programs, public health outreach systems, and radon testing and mitigation contractor networks

Plan Participant	Vulnerabilities and Impacts
	vulnerable to elevated indoor radon, chronic occupant exposure, testing and mitigation expenses, delayed occupancy or property transfers, tenant and resident communication needs, and increased exposure as new neighborhoods and public-serving facilities are developed.
Leeds	**Vulnerabilities:** Leeds is vulnerable because radon can accumulate in homes, community facilities, and other enclosed buildings with direct soil contact, especially where structures include slab-on-grade or crawlspace construction and where routine testing has not occurred. As part of Washington County, Leeds shares the county's EPA Zone 2 classification and moderate predicted screening range of 2 to 4 pCi/L, but localized indoor levels may be higher in individual buildings and can only be determined through testing. **Impacts:** Radon can increase long-term lung cancer risk for residents and other building occupants without producing visible structural effects, making delayed detection a key concern. Elevated test results may also create testing and mitigation costs for homeowners and local facilities, reduce housing marketability until corrected, and add burdens on a small community where radon service access may be more limited. Critical facilities and infrastructure potentially impacted include Leeds Town Hall and public works facilities; Leeds fire and emergency response facilities; public-facing municipal and community facilities; homes, rental units, childcare facilities, schools or community learning spaces, libraries, senior or community centers, commercial buildings, corridor-related businesses, lodging or short-term rental units, and other occupied ground-contact structures; building inspection and permitting programs, property management systems, real estate transaction processes, facility maintenance programs, public health outreach systems, and radon testing and mitigation contractor networks vulnerable to elevated indoor radon, long-term occupant exposure, testing and mitigation costs, delayed property transfers or occupancy decisions, limited local contractor availability, and communication needs for residents, business owners, travelers, and building occupants.
Virgin	**Vulnerabilities:** Virgin is vulnerable because radon can accumulate in homes, lodging, restaurants, public buildings, and other occupied structures with direct soil contact in a small Zion gateway community with limited infrastructure and high visitor use. Virgin shares Washington County's EPA Zone 2 classification and the county's moderate predicted indoor screening range of 2 to 4 pCi/L, but tourism-oriented buildings and rental units may be especially vulnerable where testing and mitigation are inconsistent. **Impacts:** Long-term radon exposure can increase lung cancer risk for residents, workers, renters, and visitors spending extended time indoors in untested buildings. Elevated indoor levels may also require mitigation, add operating costs for lodging and commercial property owners, and affect property transfer, rental, or occupancy decisions if testing identifies concentrations at or above EPA's 4 pCi/L action level. Critical facilities and infrastructure potentially impacted include Virgin Town Hall and municipal facilities; Virgin fire and emergency response facilities; public works and

Plan Participant	Vulnerabilities and Impacts
	public-facing municipal buildings; homes, rental units, childcare or community facilities, schools or community learning spaces, lodging, restaurants, visitor-serving businesses, short-term rentals, offices, and other occupied ground-contact structures in the Zion gateway corridor; building inspection and permitting programs, property management systems, real estate transaction processes, facility maintenance programs, public health outreach systems, lodging management systems, and radon testing and mitigation contractor networks vulnerable to elevated indoor radon, chronic occupant exposure, testing and mitigation expenses, visitor and employee communication needs, delayed leasing or property transfers, limited contractor availability, and operational burdens for lodging and visitor-serving facilities.
Springdale	**Vulnerabilities:** Springdale is vulnerable because radon can accumulate in homes, employee housing, hotels, restaurants, public facilities, and other frequently occupied enclosed buildings in a constrained Zion gateway corridor. Like all counties in the region, Washington County is EPA Zone 2 with predicted average indoor screening levels between 2 and 4 pCi/L, but site-specific radon levels may exceed 4 pCi/L and cannot be determined without testing. Because Springdale contains lodging and visitor-serving buildings with frequent occupancy, the consequences of unrecognized radon exposure may extend beyond permanent residents to employees and long-stay visitors. **Impacts:** Radon can increase long-term lung cancer risk for residents, workers, and visitors who spend extended time indoors, even though no visible warning signs are present. Elevated results can also create costs for testing and mitigation, and may affect building operations, visitor lodging decisions, and property management if mitigation is required to reduce indoor radon levels above EPA guidance. Critical facilities and infrastructure potentially impacted include Springdale Town Hall and municipal facilities; Springdale Police Department and emergency response facilities; public works and public-facing municipal buildings; homes, apartments, employee housing, rental units, childcare or community facilities, schools or community learning spaces, hotels, lodging areas, restaurants, visitor facilities, short-term rentals, offices, commercial buildings, and other occupied ground-contact structures in the Zion gateway corridor; building inspection and permitting programs, lodging and property management systems, real estate transaction processes, facility maintenance programs, public health outreach systems, tenant and visitor communication systems, and radon testing and mitigation contractor networks vulnerable to elevated indoor radon, long-term exposure for residents, workers, students, and visitors, testing and mitigation costs, delayed occupancy or lodging operations, property transfer or leasing complications, and facility management burdens in a high-visitor-use corridor.
New Harmony	**Vulnerabilities:** New Harmony is vulnerable because radon can build up in homes, community facilities, and other enclosed structures with direct soil contact in a rural mountain-valley setting where testing and mitigation resources may be less convenient to access. As part of Washington County,

Plan Participant	Vulnerabilities and Impacts
	the community shares the county's EPA Zone 2 classification and moderate predicted indoor screening levels of 2 to 4 pCi/L, but individual buildings may test above EPA's action level depending on local geology, construction, and ventilation. **Impacts:** Radon exposure can increase long-term lung cancer risk for residents and other occupants of untested buildings, particularly where people spend long periods indoors during colder months. Indirect impacts include testing and mitigation costs, potential delays in home sales or building use, and increased burdens on households or local facilities if certified mitigation services are limited and travel distances increase the cost of corrective work. Critical facilities and infrastructure potentially impacted include New Harmony Town Hall and municipal facilities; fire and emergency response facilities; public works and public-facing community buildings; homes, rental units, childcare or community facilities, schools or community learning spaces, libraries, senior or community centers, agricultural support buildings with occupied spaces, local businesses, and other occupied ground-contact structures; rural housing, older buildings, dispersed properties, building inspection and permitting programs, property management systems, real estate transaction processes, facility maintenance programs, public health outreach systems, and radon testing and mitigation contractor networks vulnerable to elevated indoor radon, chronic occupant exposure, testing and mitigation costs, limited local contractor availability, delayed property transfers, communication challenges, and disproportionate burdens for lower-income households, renters, older structures, and isolated rural properties.
Rockville	**Vulnerabilities:** Rockville is vulnerable because radon can accumulate in homes, historic structures, public buildings, and other enclosed ground-contact buildings in a small gateway community where older construction and limited infrastructure redundancy may delay detection and correction. Rockville shares Washington County's EPA Zone 2 classification and moderate predicted indoor screening range of 2 to 4 pCi/L, but localized conditions in older or less-ventilated structures could produce higher indoor concentrations without obvious warning signs. **Impacts:** Radon primarily affects health rather than structures, increasing long-term lung cancer risk for residents and occupants of untested historic and residential buildings. If elevated levels are found, mitigation and follow-up testing can create added costs and management burdens for a small community, and concerns about indoor air quality may also affect housing decisions, building use, and preservation planning for historic properties. Critical facilities and infrastructure potentially impacted include Rockville Town Hall and municipal facilities; fire and emergency response facilities; public works and public-facing municipal buildings; historic homes, residential structures, rental units, childcare or community facilities, visitor-serving buildings, short-term rentals, offices, public buildings, and other occupied ground-contact structures in the Zion gateway corridor; historic property management systems, building inspection and permitting programs, real

Plan Participant	Vulnerabilities and Impacts
	estate transaction processes, facility maintenance programs, public health outreach systems, lodging or rental management systems, and radon testing and mitigation contractor networks vulnerable to elevated indoor radon, chronic occupant exposure, testing and mitigation expenses, property transfer or leasing complications, visitor and resident communication needs, limited contractor availability, and added challenges where mitigation must be compatible with historic or older structures.
Apple Valley	**Vulnerabilities:** Apple Valley is vulnerable because radon can accumulate in dispersed homes, community facilities, and other enclosed structures with direct soil contact in a rural-residential setting where buildings may not be routinely tested. As part of Washington County, Apple Valley shares the county's EPA Zone 2 classification and moderate predicted indoor screening levels between 2 and 4 pCi/L, but actual indoor levels may exceed that range depending on site-specific geology, construction, and ventilation. **Impacts:** Radon can increase long-term lung cancer risk for residents and occupants of untested buildings, especially where exposure continues for years before discovery. Elevated results may also create mitigation expenses, reduce housing marketability until corrective action is completed, and create service challenges if households must rely on outside contractors to install mitigation systems in a dispersed rural community. Critical facilities and infrastructure potentially impacted include Apple Valley Town Hall and municipal facilities; fire and emergency response facilities; public works and public-facing community buildings; homes, rental units, childcare or community facilities, schools or community learning spaces, local businesses, dispersed residential structures, public buildings, and other occupied ground-contact structures; rural housing, older or self-built structures, dispersed properties, building inspection and permitting programs, property management systems, real estate transaction processes, facility maintenance programs, public health outreach systems, and radon testing and mitigation contractor networks vulnerable to elevated indoor radon, chronic occupant exposure, testing and mitigation costs, limited local contractor availability, delayed property transfers, communication challenges across dispersed neighborhoods, and disproportionate burdens for lower-income households, renters, and older or unmitigated structures.
Hildale	**Vulnerabilities:** Hildale is vulnerable because radon can accumulate in homes, schools, public facilities, and other occupied buildings with direct soil contact in a community with ongoing infrastructure needs and limited redundancy. Hildale shares Washington County's EPA Zone 2 classification and moderate predicted indoor screening levels of 2 to 4 pCi/L, but site-specific indoor concentrations can exceed the 4 pCi/L action level and remain undetected without testing. Older buildings, cracks, slab-on-grade construction, and limited ventilation can further increase exposure potential. **Impacts:** Radon can create chronic health impacts by increasing long-term lung cancer risk for residents, students, and staff in untested buildings, especially because there are no visible warning signs. If elevated levels are

Plan Participant	Vulnerabilities and Impacts
	identified, property owners and local agencies may face testing, mitigation, and communication costs, and may need outside technical and financial assistance to reduce exposure in homes, schools, and community facilities. Critical facilities and infrastructure potentially impacted include Hildale City Hall and municipal facilities; Hildale Police Department; Hildale fire and emergency response facilities; Water Canyon School and other community facilities; public works and public-facing municipal buildings; homes, rental units, childcare facilities, schools, community centers, public buildings, local businesses, and other occupied ground-contact structures; older buildings, structures with slab-on-grade construction, foundation cracks, utility penetrations, or limited ventilation, building inspection and permitting programs, property management systems, real estate transaction processes, facility maintenance programs, public health outreach systems, and radon testing and mitigation contractor networks vulnerable to elevated indoor radon, chronic occupant exposure, testing and mitigation costs, outside technical or financial assistance needs, delayed occupancy or property transfers, and communication burdens for residents, students, staff, and public facility users.

Thunderstorms and Lightning

Table 171 summarizes thunderstorm and lightning vulnerabilities and potential impacts for Washington County participants.

Table 171: Thunderstorms and Lightning Vulnerability and Impact Assessment for Washington County

Plan Participant	Vulnerabilities and Impacts
Washington County	**Vulnerabilities:** Washington County is highly vulnerable to thunderstorms and lightning because it contains the region's largest concentration of population, housing, critical facilities, businesses, transportation corridors, and recreation assets in areas regularly affected by monsoon storms. Selected documented Washington County examples include at least five thunderstorm wind events causing about $215,000 in property damage and one 2018 lightning-caused residential fire in St. George causing about $400,000 in damage, for roughly $615,000 in reported losses in those selected examples; these examples are not a complete county loss total. Vulnerable assets include homes, schools, health care facilities, utility infrastructure, major roads, public facilities, outdoor recreation areas, and wildland-urban interface locations exposed to cloud-to-ground lightning, damaging outflow winds, heavy rain, and localized flash flooding.[271]

[271] NOAA National Centers for Environmental Information, Storm Events Database, annual details CSV files, retrieved October 10, 2026. https://www.ncei.noaa.gov/pub/data/swdi/stormevents/csvfiles/. Selected examples summarized in

Plan Participant	Vulnerabilities and Impacts
	Impacts: Thunderstorms and lightning can damage roofs and siding, down trees and power lines, interrupt communications and utilities, create hazardous travel and flash flooding, and ignite structure or wildland fires. Countywide impacts may also include injuries, emergency response disruptions, school and business interruption, cleanup and repair costs, and cascading outages affecting water, wastewater, traffic control, and other critical services. Critical facilities and infrastructure potentially impacted include Washington County Sheriff's Office; Washington County Emergency Management; St. George 911 Communications Center; Southwest Utah Public Health Department; St. George Regional Hospital; Washington County School District facilities; Utah Tech University facilities; Dixie Technical College facilities; county and municipal government buildings; public safety facilities; public works facilities; Interstate 15, State Route 9, State Route 18, State Route 34, State Route 7/Southern Parkway, State Route 59, and other regional roadways, bridges, culverts, traffic signals, drainage crossings, evacuation routes, emergency response routes, and airport access routes; St. George Regional Airport; Washington County Water Conservancy District reservoirs, pipelines, pump stations, water storage, and distribution infrastructure; municipal water, wastewater, stormwater, drainage, power, communications, fiber, cellular, and utility systems; public buildings, schools, health care facilities, parks, trailheads, campgrounds, reservoir recreation facilities, tourism and visitor-serving infrastructure, agricultural buildings, sheds, fences, corrals, irrigation equipment, maintenance yards, utility poles, overhead lines, antennas, radio towers, rooftops, mechanical systems, and wildland-urban interface assets vulnerable to lightning strikes, power surges, fire ignition, wind-driven rain, localized flooding, downed lines, blocked roads, outages, and service disruptions.
St. George	**Vulnerabilities:** St. George is highly vulnerable because its dense residential and commercial development, schools, hospitals, major roads, airport-related infrastructure, utilities, and parks are exposed to recurring thunderstorm winds, cloud-to-ground lightning, and localized flash flooding. The thunderstorm profile identifies St. George as one of the county's most repeatedly affected communities, including documented thunderstorm wind property damage in 2005 and a 2018 lightning strike that caused a residential fire destroying a home and resulting in about $400,000 in damage. Large numbers of people, buildings, vehicles, and outdoor users increase exposure when storms move through the urban area. **Impacts:** Thunderstorms and lightning can damage roofs, trees, signs, vehicles, and utility systems; create dangerous travel conditions; interrupt airport, school, medical, business, and public services; and ignite structure fires. Because St. George is the region's primary service center, even localized storm damage can create broader cascading impacts through outages, roadway disruptions, emergency response delays, and costly repair and

the regional thunderstorms/lightning profile; Event 748262, 2018, reports a $400,000 lightning-caused residential fire in St. George.

Plan Participant	Vulnerabilities and Impacts
	cleanup needs affecting a large number of residents and visitors. Critical facilities and infrastructure potentially impacted include St. George City Hall and municipal government facilities; St. George Police Department; St. George Fire Department stations; St. George 911 Communications Center; St. George Regional Hospital; Utah Tech University facilities; Dixie Technical College facilities; Washington County School District schools and support facilities; St. George Regional Airport and airport access infrastructure; public works, water, wastewater, stormwater, irrigation, drainage, storage, pumping, and distribution facilities; Interstate 15, State Route 7/Southern Parkway, Bluff Street, River Road, St. George Boulevard, Riverside Drive, Red Hills Parkway, traffic signals, bridges, culverts, drainage crossings, and major arterials; Washington County Water Conservancy District facilities serving the St. George area; electric substations, overhead and underground power systems, communications, fiber, cellular, and utility infrastructure; hospitals, clinics, medical offices, commercial centers, hotels, warehouses, schools, parks, sports fields, trail systems, golf courses, recreation facilities, public buildings, signs, rooftops, mechanical systems, antennas, radio equipment, and wildland-urban interface neighborhoods vulnerable to lightning strikes, fire ignition, power surges, outages, downed lines, wind-driven debris, localized flooding, hazardous travel, airport access disruption, and emergency response delays.
Washington City	**Vulnerabilities:** Washington City is vulnerable because growing neighborhoods, schools, parks, commercial areas, roads, and utilities are exposed to thunderstorm winds, lightning, heavy rain, and occasional flash flooding across open urban and suburban terrain. The hazard profile identifies Washington as one of the county communities with documented thunderstorm wind damage, including a 2011 event contributing to the county's repeated loss history. Continued growth increases the number of people, structures, construction sites, and overhead systems that may be affected by severe weather. **Impacts:** Thunderstorms and lightning can damage roofs, fences, trees, signs, and utility infrastructure; interrupt power and communications; create unsafe travel conditions; and increase injury risk for people outdoors. City operations, schools, and daily travel may also be disrupted by debris, outages, localized flooding, and emergency response activity during and after severe storms. Critical facilities and infrastructure potentially impacted include Washington City offices and municipal facilities; Washington City Police Department; Washington City Fire Department facilities; Washington County School District schools and community facilities; public works facilities; culinary water, irrigation, wastewater, stormwater, drainage, storage, pumping, and distribution infrastructure; Interstate 15, State Route 9, Telegraph Street, Green Spring Drive, Washington Parkway, traffic signals, bridges, culverts, drainage crossings, and major access routes; Washington County Water Conservancy District facilities serving the Washington area; power, communications, fiber, cellular, and utility infrastructure; parks, trail systems, sports fields, commercial centers, public buildings, signs, rooftops, mechanical

Plan Participant	Vulnerabilities and Impacts
	systems, utility poles, overhead lines, antennas, radio equipment, construction sites, and developing neighborhoods vulnerable to lightning strikes, power surges, downed lines, outages, roof and siding damage, wind-driven debris, localized flooding, blocked roads, and interrupted emergency access.
Hurricane	**Vulnerabilities:** Hurricane is highly vulnerable because homes, schools, businesses, roads, utilities, and recreation traffic in the Hurricane Valley are exposed to thunderstorm winds, lightning, heavy rain, and occasional flash flooding. The community's expanding residential and commercial growth, overhead infrastructure, and proximity to outdoor recreation areas increase sensitivity to outflow winds, lightning strikes, and rapidly changing storm conditions. **Impacts:** Thunderstorms and lightning can damage roofs, fences, trees, and utility systems; create hazardous travel conditions; interrupt schools, businesses, and emergency access; and ignite wildland or structure fires. Severe storms may also produce localized flooding, debris cleanup needs, temporary outages, and recreation-related safety incidents affecting both residents and visitors. Critical facilities and infrastructure potentially impacted include Hurricane City Hall and municipal facilities; Hurricane Police Department; Hurricane Valley Fire District facilities; Washington County School District schools and community facilities; public works, water, wastewater, stormwater, drainage, irrigation, storage, pumping, and distribution infrastructure; Interstate 15 access routes, State Route 9, State Route 7/Southern Parkway, State Route 59, major local roads, traffic signals, bridges, culverts, drainage crossings, evacuation routes, and emergency routes; Sand Hollow Reservoir and Quail Creek Reservoir recreation-support, dam, spillway, access, and utility infrastructure; power, communications, fiber, cellular, and utility corridors; parks, trailheads, campgrounds, marinas, commercial areas, tourism businesses, public buildings, signs, rooftops, mechanical systems, overhead lines, antennas, radio equipment, utility poles, and expanding neighborhoods vulnerable to lightning strikes, fire ignition, power surges, downed lines, outages, wind-driven debris, localized flooding, recreation access disruption, and emergency response delays.
Santa Clara	**Vulnerabilities:** Santa Clara is vulnerable because homes, schools, parks, roads, public facilities, and utility systems are exposed to thunderstorm winds and lightning moving through the greater St. George urban area. The hazard profile identifies Santa Clara as one of the county communities with documented thunderstorm wind property damage, including a 2010 event contributing to the county's repeated severe-weather loss history. Trees, signs, overhead lines, and lightly built structures are especially susceptible to strong gusts and debris impacts. **Impacts:** Thunderstorms and lightning can damage buildings and landscapes, interrupt power and communications, create road obstructions, and increase public safety risks for residents and outdoor users. Severe storms may also elevate fire danger, require debris removal and infrastructure repair, and temporarily disrupt schools, city services, and neighborhood access. Critical

Plan Participant	Vulnerabilities and Impacts
	facilities and infrastructure potentially impacted include Santa Clara City Hall and municipal facilities; Santa Clara-Ivins Police Department facilities; Santa Clara fire and emergency response facilities; Washington County School District schools and community facilities; public works, water, irrigation, wastewater, stormwater, drainage, storage, pumping, and distribution systems; Old Highway 91, Santa Clara Drive, Pioneer Parkway, traffic signals, bridges, culverts, drainage crossings, and emergency routes; Santa Clara River corridor infrastructure; power, communications, fiber, cellular, and utility infrastructure; parks, trails, recreation areas, public buildings, commercial areas, neighborhoods, signs, rooftops, mechanical systems, overhead lines, utility poles, antennas, radio equipment, and slope- or river-adjacent facilities vulnerable to lightning strikes, fire ignition, power surges, downed lines, outages, roof and siding damage, wind-driven debris, localized flooding, road obstructions, and temporary disruption of city services and neighborhood access.
Ivins	**Vulnerabilities:** Ivins is vulnerable because neighborhoods, roads, public facilities, tourism-related amenities, trails, and utility systems are exposed to thunderstorm winds and lightning across open desert terrain and near slope transitions. The city's growth and reliance on limited transportation and utility connections increase sensitivity to downed lines, debris, wildfire ignition from lightning, and storm-related recreation safety concerns. **Impacts:** Thunderstorms and lightning can damage roofs, fences, trees, and utility components; disrupt power and communications; create hazardous travel conditions; and threaten people engaged in outdoor recreation or events. Lightning-caused fire, debris cleanup, and temporary service interruptions may also affect tourism amenities, city operations, and emergency response access. Critical facilities and infrastructure potentially impacted include Ivins City Hall and municipal facilities; Santa Clara-Ivins Police Department facilities serving Ivins; Ivins fire and emergency response facilities; Washington County School District schools and community facilities; public works, water, wastewater, stormwater, drainage, irrigation, storage, pumping, and distribution infrastructure; Old Highway 91, Center Street, Snow Canyon Parkway, local access routes, bridges, culverts, traffic-control devices, drainage crossings, and emergency routes; overhead and underground power, communications, fiber, cellular, and utility infrastructure; parks, trailheads, recreation facilities, tourism-related amenities, public buildings, signs, rooftops, mechanical systems, antennas, radio equipment, utility poles, and desert-edge neighborhoods vulnerable to lightning strikes, fire ignition, power surges, outages, downed lines, wind-driven debris, roof damage, hazardous travel, recreation access disruption, and temporary service interruptions.
La Verkin	**Vulnerabilities:** La Verkin is vulnerable because homes, roads, bridges, schools, utilities, and public facilities are located in a valley-and-river corridor setting where thunderstorm winds, lightning, brief heavy rain, and localized flash flooding can occur. The community's transportation connections,

Plan Participant	Vulnerabilities and Impacts
	overhead infrastructure, and proximity to canyon and recreation travel corridors increase sensitivity to debris, outages, and rapidly changing weather affecting residents and travelers. **Impacts:** Thunderstorms and lightning can damage property and utility systems, create hazardous travel on local roads and corridor routes, interrupt public services and school access, and increase wildfire ignition potential during dry storms. Localized flooding, debris, and power disruption may also raise public works and cleanup costs and affect tourism and traveler safety in the area. Critical facilities and infrastructure potentially impacted include La Verkin City offices and municipal facilities; La Verkin Police Department; La Verkin fire and emergency response facilities; Washington County School District schools and community facilities; public works, water, wastewater, stormwater, drainage, storage, pumping, and utility infrastructure; State Route 9, State Route 17, local bridges, culverts, traffic-control devices, drainage crossings, evacuation routes, and Zion gateway access routes; La Verkin Creek, Ash Creek, Virgin River corridor, and adjacent transportation and utility infrastructure; overhead and underground electric, communications, fiber, cellular, and utility infrastructure; parks, trailheads, visitor-serving businesses, public buildings, signs, rooftops, mechanical systems, antennas, radio equipment, utility poles, and river- or corridor-adjacent neighborhoods vulnerable to lightning strikes, fire ignition, power surges, downed lines, outages, wind-driven debris, localized flooding, road blockage, public service disruption, and visitor travel delays.
Enterprise	**Vulnerabilities:** Enterprise is vulnerable because homes, agricultural buildings, corrals, fences, roads, schools, utilities, and farm operations are exposed across open rural terrain where thunderstorms can produce lightning, microburst winds, brief heavy rain, and wildfire-starting dry lightning. Although smaller than the urban corridor communities, Enterprise's agricultural assets, overhead infrastructure, and limited route redundancy increase the proportion of the community that can be affected by a single storm. **Impacts:** Thunderstorms and lightning can damage outbuildings, fences, equipment, and utility systems; interrupt power and road access; threaten livestock, workers, and school operations; and ignite rangeland or interface fires. Recovery may be prolonged where local staffing and financial capacity are limited and where storm damage affects both public infrastructure and agricultural production at the same time. Critical facilities and infrastructure potentially impacted include Enterprise City offices and municipal facilities; Enterprise Police Department; Enterprise fire and emergency response facilities; Washington County School District schools and community facilities; public works, municipal and domestic water systems, wells, wastewater, drainage, stormwater, irrigation, storage, pumping, and agricultural water infrastructure; State Route 18, local roads, bridges, culverts, traffic-control devices, drainage crossings, rural access routes, and emergency routes; reservoirs, irrigation systems, canals, storage ponds, farms, ranches, barns,

Plan Participant	Vulnerabilities and Impacts
	sheds, corrals, fields, livestock water supplies, and agricultural support facilities; power, communications, fiber, cellular, and utility infrastructure; parks, public buildings, signs, maintenance yards, exposed vehicles and equipment, utility poles, overhead lines, antennas, and radio equipment vulnerable to lightning strikes, fire ignition, power surges, downed lines, outages, wind-driven debris, localized flooding, agricultural disruption, road blockage, and delayed emergency response.
Toquerville	**Vulnerabilities:** Toquerville is vulnerable because homes, roads, utilities, schools, and expanding residential areas are exposed on open terrain and near drainage corridors where thunderstorms can bring lightning, damaging outflow winds, and heavy rain. The hazard profile identifies Toquerville as one of the county communities with documented thunderstorm wind property damage, including a 2024 event contributing to the county's overall severe-weather loss history. Growth continues to add structures, overhead systems, and people in storm-exposed settings. **Impacts:** Thunderstorms and lightning can damage roofs, fences, trees, and utility lines; create road hazards and localized flooding; interrupt public services and school access; and increase wildfire risk during dry and windy storm conditions. Repeated storm impacts may also increase cleanup, repair, and maintenance costs for the town's transportation, drainage, and utility infrastructure. Critical facilities and infrastructure potentially impacted include Toquerville Town Hall and municipal facilities; Toquerville fire and emergency response facilities; public works and utility facilities; Washington County School District schools and community facilities serving the area; culinary water, irrigation, wastewater, stormwater, drainage, storage, pumping, and distribution infrastructure; State Route 17, Interstate 15 access routes, local roads, bridges, culverts, traffic-control devices, drainage crossings, evacuation routes, and developing neighborhood access roads; Ash Creek and La Verkin Creek watershed drainage infrastructure; power, communications, fiber, cellular, and utility infrastructure; parks, trails, public buildings, visitor-serving facilities, signs, rooftops, mechanical systems, antennas, radio equipment, overhead lines, utility poles, and expanding neighborhoods vulnerable to lightning strikes, fire ignition, power surges, outages, downed lines, wind-driven debris, localized flooding, road hazards, neighborhood access disruption, and increased maintenance needs.
Leeds	**Vulnerabilities:** Leeds is vulnerable because homes, Interstate 15 access points, local roads, utility systems, and community facilities are exposed to strong thunderstorm winds and lightning in a geologically constrained area influenced by open gaps and major travel corridors. Transportation links, overhead utilities, trees, and signs are especially susceptible to crosswinds, debris, and outage-causing electrical damage.

Plan Participant	Vulnerabilities and Impacts
	Impacts: Thunderstorms and lightning can cause roof and fence damage, down power lines, create hazardous driving conditions on local and interstate routes, and interrupt utility service and emergency access. Because Leeds is connected to major regional travel corridors, even localized storm impacts may create wider transportation and safety consequences beyond the town itself. Critical facilities and infrastructure potentially impacted include Leeds Town Hall and public works facilities; Leeds fire and emergency response facilities; water, wastewater, stormwater, drainage, storage, pumping, and utility infrastructure; Interstate 15, Main Street, local roads, bridges, culverts, traffic-control devices, access ramps, drainage crossings, evacuation routes, and corridor transportation infrastructure; Leeds Creek, Quail Creek, and nearby drainage corridor infrastructure; overhead and underground electric, communications, fiber, cellular, and utility infrastructure; parks, public buildings, community facilities, signs, rooftops, mechanical systems, antennas, radio equipment, utility poles, corridor businesses, and interstate-related infrastructure vulnerable to lightning strikes, fire ignition, power surges, outages, downed lines, wind-driven debris, localized flooding, hazardous travel, interstate access disruption, and delayed emergency response.
Virgin	**Vulnerabilities:** Virgin is vulnerable because homes, lodging, restaurants, SR-9, utility systems, and visitor-serving facilities are exposed in the Zion gateway corridor where thunderstorms can produce lightning, strong outflow winds, heavy rain, and dangerous rapidly changing conditions for residents and visitors. Limited access routes, tourism activity, and overhead infrastructure increase sensitivity to storm damage and travel disruption. **Impacts:** Thunderstorms and lightning can damage buildings and utilities, create hazardous travel on SR-9, interrupt business and lodging operations, and threaten people in outdoor settings. Severe storms may also produce localized flooding, wildfire ignition, and emergency response complications that affect both local commerce and visitor movement in the gateway corridor. Critical facilities and infrastructure potentially impacted include Virgin Town Hall and municipal facilities; Virgin fire and emergency response facilities; public works, water, wastewater, drainage, storage, pumping, and utility infrastructure; State Route 9, local roads, bridges, culverts, traffic-control devices, drainage crossings, evacuation routes, and Zion gateway access routes; Virgin River corridor and adjacent transportation and utility infrastructure; overhead and underground electric, communications, fiber, cellular, and utility corridors; lodging, restaurants, visitor-serving businesses, parks, trailheads, campgrounds, recreation access points, public buildings, signs, rooftops, mechanical systems, antennas, radio equipment, utility poles, and corridor neighborhoods vulnerable to lightning strikes, fire ignition, power surges, outages, downed lines, wind-driven debris, localized flooding, SR-9 travel disruption, visitor service interruption, and emergency response constraints.
Springdale	**Vulnerabilities:** Springdale is highly vulnerable because lodging, restaurants, homes, roads, utilities, and visitor facilities are concentrated in a narrow Zion

Plan Participant	Vulnerabilities and Impacts
	gateway corridor with constrained access, steep surrounding terrain, and high visitor volumes exposed to lightning, strong winds, and rapidly changing storm conditions. The town shares the elevated recreation and corridor exposure described for nearby gateway communities and is especially sensitive where outdoor users, employees, and travelers have limited shelter and transportation redundancy. **Impacts:** Thunderstorms and lightning can damage tourism infrastructure, interrupt utility service, create hazardous travel and evacuation conditions, threaten people outdoors, and cause temporary closure of recreation or visitor-serving sites. Even moderate storm impacts can create outsized life-safety and economic consequences because Springdale depends on tourism, a single constrained corridor, and uninterrupted access to Zion-area destinations. Critical facilities and infrastructure potentially impacted include Springdale Town Hall and municipal facilities; Springdale Police Department and emergency response facilities; public works, water, wastewater, drainage, stormwater, storage, pumping, and utility infrastructure; State Route 9, Zion Canyon access routes, shuttle-related transportation facilities, local roads, bridges, culverts, traffic-control devices, drainage crossings, evacuation routes, and visitor access corridors; Virgin River corridor and canyon-slope infrastructure; overhead and underground electric, communications, fiber, cellular, and utility infrastructure; hotels, restaurants, lodging areas, employee housing, visitor facilities, parks, trailheads, public buildings, Zion gateway recreation assets, public gathering areas, signs, rooftops, mechanical systems, antennas, radio equipment, and utility poles vulnerable to lightning strikes, fire ignition, power surges, outages, downed lines, wind-driven debris, localized flooding, visitor access disruption, evacuation constraints, tourism interruption, and emergency response delays.
New Harmony	**Vulnerabilities:** New Harmony is vulnerable because homes, roads, water systems, community facilities, and agricultural or open lands are exposed in a rural mountain-valley setting where thunderstorms can produce lightning, strong winds, and heavy rain. Limited alternate access, overhead infrastructure, and exposure of outdoor workers and travelers increase sensitivity to outages, road obstructions, and storm-related fire or flood concerns. **Impacts:** Thunderstorms and lightning can damage roofs, trees, power lines, and local infrastructure; interrupt emergency response and local travel; and raise wildfire ignition risk during dry storms. Recovery may be slower where staffing and resources are limited and where roads, water systems, or utilities are disrupted by debris, outages, or localized flooding. Critical facilities and infrastructure potentially impacted include New Harmony Town Hall and municipal facilities; fire and emergency response facilities; public works, local and domestic water systems, wells, storage, pumping, wastewater, drainage, and utility infrastructure; Interstate 15, State Route 144, local roads, bridges, culverts, traffic-control devices, drainage crossings, evacuation routes, and rural access roads; Ash Creek watershed drainage crossings and nearby

Plan Participant	Vulnerabilities and Impacts
	transportation and utility infrastructure; power, communications, fiber, cellular, and utility corridors; agricultural and open lands, irrigation systems, livestock water supplies, parks, community facilities, public buildings, public landscapes, sheds, fences, maintenance facilities, utility poles, overhead lines, antennas, and radio equipment vulnerable to lightning strikes, fire ignition, power surges, outages, downed lines, wind-driven debris, localized flooding, rural access disruption, utility interruption, and delayed emergency response.
Rockville	**Vulnerabilities:** Rockville is especially vulnerable because homes, historic resources, roads, bridges, utilities, and public spaces are concentrated in a small Zion gateway setting with limited access and repeated weather exposure. A 2021 NCEI wind record coded to Rockville describes property damage in Hildale; that record does not establish damage in Rockville. Outdoor users, older structures, and corridor infrastructure are particularly susceptible to lightning, wind, and heavy-rain-related hazards.[272] **Impacts:** Thunderstorms and lightning can damage historic and residential structures, block roads, interrupt utilities, and create dangerous conditions for residents and visitors. Because the community is small and transportation options are limited, even localized storm damage can significantly affect evacuation, emergency response, tourism activity, and recovery operations. Critical facilities and infrastructure potentially impacted include Rockville Town Hall and municipal facilities; fire and emergency response facilities; public works, water, wastewater, drainage, storage, pumping, and utility infrastructure; State Route 9, local roads, bridges, culverts, traffic-control devices, drainage crossings, evacuation routes, and Zion gateway access routes; Virgin River corridor and adjacent canyon-slope infrastructure; overhead and underground electric, communications, fiber, cellular, and utility infrastructure; historic buildings, homes, parks, trailheads, visitor-serving facilities, public buildings, public spaces, scenic or historic community resources, signs, rooftops, mechanical systems, antennas, radio equipment, and utility poles vulnerable to lightning strikes, fire ignition, power surges, outages, downed lines, wind-driven debris, localized flooding, constrained evacuation, visitor disruption, damage to older or historic structures, and emergency response delays.
Apple Valley	**Vulnerabilities:** Apple Valley is vulnerable where dispersed homes, local roads, water systems, and community facilities are exposed across open rural-residential terrain where thunderstorms can produce lightning, damaging winds, and heavy rain. The town's dispersed layout, overhead infrastructure, and distance from some services can increase sensitivity to outages, travel hazards, and delayed response during severe weather. **Impacts:** Thunderstorms and lightning can damage homes, outbuildings, fences, and utility systems; create hazardous travel; interrupt access to

[272] NOAA National Centers for Environmental Information, Storm Events Database, annual details CSV files, retrieved October 10, 2026. https://www.ncei.noaa.gov/pub/data/swdi/stormevents/csvfiles/ Event 974340, July 24, 2021. Database location label and damage narrative refer to different places.

Plan Participant	Vulnerabilities and Impacts
	essential services and emergency response; and increase wildfire ignition potential. Recovery may be challenging if multiple dispersed neighborhoods are affected at once or if repairs require outside contractors and extended restoration timelines. Critical facilities and infrastructure potentially impacted include Apple Valley Town Hall and municipal facilities; fire and emergency response facilities; public works, community water systems, wells, storage, pumping, wastewater, drainage, and utility infrastructure; State Route 59, local roads, bridges, culverts, washes, traffic-control devices, drainage crossings, evacuation routes, and rural access roads; power, communications, fiber, cellular, and utility corridors; parks, community facilities, dispersed residential water systems, public buildings, open-space resources, limited agricultural or livestock support infrastructure, maintenance facilities, homes, outbuildings, fences, utility poles, overhead lines, antennas, radio equipment, and exposed vehicles or equipment vulnerable to lightning strikes, fire ignition, power surges, outages, downed lines, wind-driven debris, localized flooding, delayed emergency access, and service challenges across dispersed neighborhoods.
Hildale	**Vulnerabilities:** Hildale is vulnerable because homes, schools, roads, utility and water systems, and public facilities are exposed in rugged terrain and drainage-sensitive areas where thunderstorms can bring lightning, strong winds, and sudden heavy rain. Limited infrastructure redundancy, overhead utilities, and constrained access routes increase sensitivity to outages, debris, hazardous travel, and wildfire ignition during dry storm conditions. **Impacts:** Thunderstorms and lightning can damage buildings and utility systems, interrupt water and electric service, block roads, threaten people outdoors, and disrupt emergency response and public safety operations. In a community with ongoing infrastructure needs, repeated storm impacts may increase recovery demands and require outside technical and financial assistance to restore services and access. Critical facilities and infrastructure potentially impacted include Hildale City Hall and municipal facilities; Hildale Police Department; Hildale fire and emergency response facilities; Water Canyon School and other community facilities; public works, culinary water, wastewater, stormwater, drainage, storage, pumping, and utility infrastructure; Utah State Route 59, local roads, bridges, culverts, washes, traffic-control devices, drainage crossings, community access routes, and evacuation routes; power, communications, fiber, cellular, and utility corridors; parks, public buildings, residential water systems, public landscapes, drainage-sensitive open areas, homes, outbuildings, signs, rooftops, mechanical systems, antennas, radio equipment, utility poles, and overhead lines vulnerable to lightning strikes, fire ignition, power surges, outages, downed lines, wind-driven debris, localized flooding, road blockage, water and electric service interruption, isolation, delayed emergency response, and increased need for outside technical and financial assistance.

Tornadoes

Table 172 summarizes tornado vulnerabilities and potential impacts for Washington County participants.

Table 172: Tornadoes Vulnerability and Impact Assessment for Washington County

Plan Participant	Vulnerabilities and Impacts
Washington County	**Vulnerabilities:** Washington County is vulnerable to tornadoes because it contains the region's largest concentration of population, housing, schools, medical services, businesses, utilities, transportation corridors, and visitor-serving development in areas that may be affected by localized tornado wind damage. The tornado profile identifies two Washington County tornado records during 2000–2025, rated EF0 in 2011 and EFU (unknown intensity) in 2017. Countywide planning context includes 213,670 residents and 91,460 housing units in 2025 and 69,786 households in the 2020–2024 ACS; these totals do not quantify tornado exposure. Additional vulnerable populations include 23.8% of residents under age 18, 22.4% age 65 or older, and 9.0% of residents under age 65 with a disability. Critical facilities at risk include schools, St. George Regional Hospital River Road Emergency Department, major corridors such as Interstate 15, State Route 9, and State Route 18, and concentrations of manufactured housing, older housing, and visitor-serving facilities where shelter options may be limited.[273] **Impacts:** Tornadoes in Washington County are expected to be infrequent but can still cause meaningful localized consequences where paths intersect dense neighborhoods, schools, commercial areas, utilities, and major travel routes. Regionally, NOAA/NCEI records show 10 tornado records on 10 distinct dates across the five counties during 2000–2025 causing about $300,000 in property damage with no reported deaths or injuries; a tornado affecting Washington County could damage roofs, siding, windows, signs, vehicles, power lines, communications equipment, and trees. Potential impacts include structural damage, debris-blocked roads, utility outages, temporary business interruption, school disruption, reduced access to medical care, and cascading effects on emergency response, visitor travel, and essential community services.[274] Critical facilities and infrastructure potentially impacted include Washington County Sheriff's Office; Washington County Emergency Management; St. George 911 Communications Center; Southwest Utah Public Health Department; St. George Regional Hospital and emergency

[273] U.S. Census Bureau, QuickFacts: Washington County, Utah; July 1, 2025 population and housing estimates (V2025), 2020 Census, and 2020–2024 American Community Survey, as applicable. Age percentages are those reported in QuickFacts. https://www.census.gov/quickfacts/fact/table/washingtoncountyutah/PST045225. Accessed October 10, 2026. NOAA National Centers for Environmental Information, Storm Events Database, annual details CSV files, retrieved October 10, 2026. https://www.ncei.noaa.gov/pub/data/swdi/stormevents/csvfiles/ Washington County tornado Events 346603 (2011) and 715693 (2017).

[274] NOAA National Centers for Environmental Information, Storm Events Database, annual details CSV files, retrieved October 10, 2026. https://www.ncei.noaa.gov/pub/data/swdi/stormevents/csvfiles/ Tornado records, county-based selection for Beaver, Garfield, Iron, Kane, and Washington counties, 2000–2025. Ten records on ten dates; $300,000 reported property damage; no reported deaths or injuries.

Plan Participant	Vulnerabilities and Impacts
	care sites; Washington County School District schools, transportation, and support facilities; Utah Tech University facilities; Dixie Technical College facilities; county and municipal government buildings; public safety facilities; EMS[275] resources; public works facilities; Interstate 15, State Route 9, State Route 18, State Route 34, State Route 7/Southern Parkway, State Route 59, and other regional roads, bridges, culverts, traffic-control devices, signs, evacuation routes, airport access routes, and emergency response routes; St. George Regional Airport; electric distribution lines, substations, communications towers, fiber, cellular, internet, dispatch, and radio systems; water, wastewater, stormwater, drainage, fuel, and utility systems; hospitals, clinics, schools, public buildings, retail centers, lodging, tourism-oriented businesses, parks, recreation sites, outdoor venues, manufactured housing, older housing, apartments, large-span commercial or institutional buildings, agricultural buildings, barns, outbuildings, fencing, irrigation systems, equipment, rooftops, mechanical systems, antennas, utility poles, overhead lines, vehicles, and trees vulnerable to tornado winds, windborne debris, roof or structural damage, broken windows, downed power and communications lines, blocked roads, utility disruption, loss of emergency access, school disruption, medical access interruption, visitor sheltering needs, and short-term interruption of essential services.
St. George	**Vulnerabilities:** St. George is highly vulnerable because it contains the county's largest concentration of homes, apartments, schools, hospitals, businesses, utilities, and regional transportation infrastructure that could be affected by a localized tornado path. Within Washington County, St. George includes dense neighborhoods, manufactured and older housing, high-value commercial property, and heavily used lifeline systems that can be disrupted even by weak to moderate EF0 to EF2 tornadoes. The reviewed 2000–2025 county records include an EF0 tornado in 2011 and an EFU tornado in 2017; they do not establish a tornado footprint over the city. **Impacts:** Tornadoes can damage roofs, windows, siding, signs, vehicles, utility poles, and trees; interrupt power and communications; and create dangerous roadway debris and short-term service disruption. Because St. George is the regional service hub, even localized tornado damage could affect hospitals, schools, commerce, emergency response, and major travel routes, creating broader cascading impacts across Washington County while generating costly repair and cleanup needs. Critical facilities and infrastructure potentially impacted include St. George City Hall and municipal government facilities; St. George Police Department; St. George Fire Department stations; St. George 911 Communications Center; St. George Regional Hospital and emergency care facilities; Utah Tech University facilities; Dixie Technical College facilities; Washington County School District schools and support facilities; St. George Regional Airport and airport access infrastructure; public works, water, wastewater, stormwater, drainage, storage, pumping, and distribution facilities; Interstate 15, State Route 7/Southern Parkway, Bluff Street, River

[275] EMS = emergency medical services

Plan Participant	Vulnerabilities and Impacts
	Road, St. George Boulevard, Riverside Drive, Red Hills Parkway, traffic signals, bridges, culverts, signs, and major arterials; Washington County Water Conservancy District facilities serving the St. George area; electric substations, overhead and underground power systems, communications, fiber, cellular, internet, radio, and dispatch infrastructure; hospitals, clinics, medical offices, commercial centers, hotels, warehouses, schools, parks, sports fields, trail systems, golf courses, recreation facilities, public buildings, manufactured or older housing, apartments, large-span buildings, rooftops, windows, signs, vehicles, mechanical systems, antennas, utility poles, overhead lines, and trees vulnerable to tornado winds, windborne debris, roof and siding damage, broken windows, downed lines, roadway debris, airport access disruption, emergency response delays, business interruption, school disruption, and short-term interruption of regional services.
Washington City	**Vulnerabilities:** Washington City is vulnerable because growing neighborhoods, schools, parks, commercial areas, roads, and utility systems could be affected if a tornado path crosses developed portions of the city. The broader county has documented EF0 and EFU tornado reports during 2000–2025, and Washington City's continued growth increases the number of homes, public facilities, and overhead systems that may be exposed to localized wind damage, flying debris, and short warning times. **Impacts:** Tornadoes can damage homes and community facilities, break windows, strip roofing, overturn or damage lighter structures, down trees and utility lines, and create roadway blockages. Even a short-lived tornado could interrupt schools, city operations, utilities, and neighborhood access, while generating repair costs and temporary disruptions to emergency response and daily travel. Critical facilities and infrastructure potentially impacted include Washington City offices and municipal facilities; Washington City Police Department; Washington City Fire Department facilities; Washington County School District schools and community facilities; public works facilities; culinary water, irrigation, wastewater, stormwater, drainage, storage, pumping, and distribution infrastructure; Interstate 15, State Route 9, Telegraph Street, Green Spring Drive, Washington Parkway, traffic signals, bridges, culverts, signs, and major access routes; Washington County Water Conservancy District facilities serving the Washington area; power, communications, fiber, cellular, internet, radio, and utility infrastructure; parks, trail systems, sports fields, commercial centers, public buildings, neighborhoods, manufactured or older housing, rooftops, windows, signs, vehicles, mechanical systems, antennas, utility poles, overhead lines, trees, and developing areas vulnerable to tornado winds, windborne debris, roof and siding damage, broken windows, downed power and communications lines, blocked roads, utility disruption, city service interruption, school disruption, and interrupted emergency access.
Hurricane	**Vulnerabilities:** Hurricane is vulnerable because homes, schools, businesses, roads, utilities, and public facilities in the Hurricane Valley may be affected by localized tornado wind damage associated with severe thunderstorms.

Plan Participant	Vulnerabilities and Impacts
	Continued residential and commercial growth increases the number of people and structures exposed, especially where manufactured housing, older buildings, overhead utilities, and heavily traveled local roads could be affected by an EF0 to EF2 event. **Impacts:** Tornadoes can damage roofs, windows, garages, fences, signs, vehicles, and utility infrastructure; create debris-blocked roads; and interrupt power, communications, and emergency access. Even a weak tornado can create costly property damage and short-term disruption to schools, businesses, and city services, while stronger localized winds may increase repair needs for public infrastructure and private development. Critical facilities and infrastructure potentially impacted include Hurricane City Hall and municipal facilities; Hurricane Police Department; Hurricane Valley Fire District facilities; Washington County School District schools and community facilities; public works, water, wastewater, stormwater, drainage, irrigation, storage, pumping, and distribution infrastructure; Interstate 15 access routes, State Route 9, State Route 7/Southern Parkway, State Route 59, traffic signals, bridges, culverts, signs, evacuation routes, and major local roads; Sand Hollow Reservoir and Quail Creek Reservoir recreation-support, access, marina, campground, dam, spillway, and utility infrastructure; power, communications, fiber, cellular, internet, radio, and utility corridors; parks, trailheads, campgrounds, marinas, commercial areas, tourism businesses, public buildings, manufactured or older housing, lightweight structures, rooftops, garages, windows, fences, signs, vehicles, mechanical systems, antennas, utility poles, overhead lines, and trees vulnerable to tornado winds, windborne debris, roof and structural damage, downed lines, utility outages, roadway blockage, recreation access disruption, school and business interruption, and emergency response delays.
Santa Clara	**Vulnerabilities:** Santa Clara is vulnerable where residential neighborhoods, schools, parks, roads, and utility systems are exposed to highly localized tornado winds that may occur with severe thunderstorms. The community shares Washington County's documented tornado history and includes homes, older structures, trees, signs, and overhead lines that can be damaged even by lower-intensity EF0 to EF1 events. **Impacts:** Tornadoes can damage buildings, vehicles, fencing, roofs, and utility systems; down trees and poles; and create hazardous debris and temporary access problems. A localized tornado could also interrupt schools, neighborhood services, and city operations while increasing emergency response and cleanup demands in affected areas. Critical facilities and infrastructure potentially impacted include Santa Clara City Hall and municipal facilities; Santa Clara-Ivins Police Department facilities; Santa Clara fire and emergency response facilities; Washington County School District schools and community facilities; public works, water, irrigation, wastewater, stormwater, drainage, storage, pumping, and distribution systems; Old Highway 91, Santa Clara Drive, Pioneer Parkway, traffic signals, bridges, culverts, signs, local access routes, and emergency routes; Santa Clara River corridor infrastructure;

Plan Participant	Vulnerabilities and Impacts
	power, communications, fiber, cellular, internet, radio, and utility infrastructure; parks, trails, recreation facilities, public buildings, commercial areas, neighborhoods, older structures, rooftops, windows, fences, signs, vehicles, mechanical systems, antennas, utility poles, overhead lines, and trees vulnerable to tornado winds, windborne debris, roof and siding damage, broken windows, downed trees or limbs, downed power and communications lines, utility interruption, temporary road closures, city service disruption, and increased emergency response and cleanup demands.
Ivins	**Vulnerabilities:** Ivins is vulnerable where homes, roads, public facilities, tourism-related amenities, and utility systems are exposed to localized tornadoes and severe thunderstorm winds moving across open desert terrain and developing neighborhoods. Although tornado occurrence is relatively low, even weak events can affect lightweight structures, older homes, overhead utilities, and places where shelter options are limited during outdoor activities or public events. **Impacts:** Tornadoes can damage roofs, windows, fences, vehicles, signs, and utility infrastructure; create short-term road obstructions; and disrupt public services, recreation access, and emergency response. Localized tornado damage may also increase repair and stabilization costs for city facilities and private properties and complicate operations in areas with limited transportation redundancy. Critical facilities and infrastructure potentially impacted include Ivins City Hall and municipal facilities; Santa Clara-Ivins Police Department facilities serving Ivins; Ivins fire and emergency response facilities; Washington County School District schools and community facilities; public works, water, wastewater, stormwater, drainage, irrigation, storage, pumping, and distribution infrastructure; Old Highway 91, Center Street, Snow Canyon Parkway, local access routes, bridges, culverts, traffic-control devices, signs, and emergency routes; overhead and underground power, communications, fiber, cellular, internet, radio, and utility infrastructure; parks, trailheads, recreation facilities, tourism-related amenities, public buildings, neighborhoods, lightweight structures, older homes, rooftops, windows, fences, signs, vehicles, mechanical systems, antennas, utility poles, overhead lines, and trees vulnerable to tornado winds, windborne debris, roof damage, broken windows, downed lines, utility outages, short-term road obstructions, recreation access disruption, neighborhood isolation, public service disruption, and emergency response delays.
La Verkin	**Vulnerabilities:** La Verkin is vulnerable because homes, schools, roads, bridges, utility systems, and public facilities are concentrated in a corridor setting where a localized tornado could affect both residents and travelers. Overhead infrastructure, older or lighter buildings, and transportation connections increase sensitivity to wind damage, flying debris, and short-term service disruption even if tornadoes remain infrequent. **Impacts:** Tornadoes can damage roofs, windows, utility lines, vehicles, and public facilities; create debris-blocked roads and bridge approaches; and interrupt power, communications, and emergency access. Because La Verkin

Plan Participant	Vulnerabilities and Impacts
	supports nearby corridor travel, even localized damage could affect daily commerce, school access, and connections to neighboring communities while generating repair and cleanup costs. Critical facilities and infrastructure potentially impacted include La Verkin City offices and municipal facilities; La Verkin Police Department; La Verkin fire and emergency response facilities; Washington County School District schools and community facilities; public works, water, wastewater, stormwater, drainage, storage, pumping, and utility infrastructure; State Route 9, State Route 17, local roads, bridges, culverts, traffic-control devices, signs, evacuation routes, and Zion gateway access routes; La Verkin Creek, Ash Creek, Virgin River corridor, and adjacent transportation and utility infrastructure; overhead and underground electric, communications, fiber, cellular, internet, radio, and utility infrastructure; parks, trailheads, visitor-serving businesses, public buildings, neighborhoods, older or lighter structures, rooftops, windows, signs, vehicles, mechanical systems, antennas, utility poles, overhead lines, and trees vulnerable to tornado winds, windborne debris, roof and window damage, downed lines, power and communications outages, blocked roads and bridge approaches, utility disruption, emergency access delays, school access disruption, daily commerce interruption, and Zion gateway travel delays.
Enterprise	**Vulnerabilities:** Enterprise is vulnerable because homes, schools, agricultural buildings, corrals, barns, local businesses, roads, utility systems, and farm infrastructure could be affected by a localized tornado path crossing open rural terrain. While tornado occurrence is relatively low, even weak to moderate EF0 to EF1 tornadoes can damage manufactured homes, older buildings, agricultural structures, fences, irrigation equipment, and overhead utilities, and the community's limited route redundancy can increase consequences if a tornado damages key local roads or service lines. **Impacts:** Tornadoes can damage roofs, windows, outbuildings, utility lines, fences, and agricultural support facilities; create debris-blocked roads; interrupt power and communications; and threaten workers, students, and residents with limited shelter options. Recovery may be prolonged where local staffing, equipment, and financial resources are limited, and a single localized event could disrupt both municipal services and agricultural operations at the same time. Critical facilities and infrastructure potentially impacted include Enterprise City offices and municipal facilities; Enterprise Police Department; Enterprise fire and emergency response facilities; Washington County School District schools and community facilities; public works, municipal and domestic water systems, wells, wastewater, drainage, stormwater, irrigation, storage, pumping, and agricultural water infrastructure; State Route 18, local roads, bridges, culverts, traffic-control devices, signs, rural access routes, and emergency routes; reservoirs, irrigation systems, canals, storage ponds, farms, ranches, barns, sheds, corrals, fencing, fields, livestock water supplies, and agricultural support facilities; power, communications, fiber, cellular, internet, radio, and utility infrastructure; parks, public buildings, maintenance yards, exposed vehicles and equipment, manufactured or older housing,

Plan Participant	Vulnerabilities and Impacts
	outbuildings, rooftops, windows, mechanical systems, antennas, utility poles, and overhead lines vulnerable to tornado winds, windborne debris, roof and structural damage, downed lines, blocked rural roads, utility interruption, agricultural disruption, limited sheltering, delayed emergency response, and prolonged recovery where local staffing, equipment, and financial resources are limited.
Toquerville	**Vulnerabilities:** Toquerville is vulnerable because growing residential areas, schools, roads, utilities, and public facilities could be affected if a localized tornado crosses the community or nearby developed corridors. Continued growth increases the number of homes, lighter structures, overhead utilities, and transportation links exposed to tornado wind damage, and the town's setting near open terrain and drainage corridors can increase debris and access problems even during lower-intensity EF0 to EF1 events. **Impacts:** Tornadoes can damage roofs, windows, fences, signs, vehicles, and utility systems; down trees and poles; and create roadway obstructions that interrupt emergency response, school access, and neighborhood travel. Even a short-duration tornado could generate costly repair needs for public and private property, disrupt utilities and city services, and create temporary safety concerns for residents and travelers. Critical facilities and infrastructure potentially impacted include Toquerville Town Hall and municipal facilities; Toquerville fire and emergency response facilities; public works and utility facilities; Washington County School District schools and community facilities serving the area; culinary water, irrigation, wastewater, stormwater, drainage, storage, pumping, and distribution infrastructure; State Route 17, Interstate 15 access routes, local roads, bridges, culverts, traffic-control devices, signs, evacuation routes, and developing neighborhood access roads; Ash Creek and La Verkin Creek watershed drainage infrastructure; power, communications, fiber, cellular, internet, radio, and utility infrastructure; parks, trails, public buildings, visitor-serving facilities, neighborhoods, lighter structures, rooftops, windows, fences, signs, vehicles, mechanical systems, antennas, utility poles, overhead lines, and trees vulnerable to tornado winds, windborne debris, roof damage, broken windows, downed lines, outages, blowing debris, road obstructions, neighborhood access disruption, school and city service interruption, and temporary safety concerns for residents and travelers.
Leeds	**Vulnerabilities:** Leeds is vulnerable because homes, Interstate 15 access points, local roads, utility systems, and community facilities could be affected by a localized tornado crossing a geologically constrained area tied to major travel corridors. Even relatively weak tornadoes can damage roofs, signs, vehicles, overhead utilities, and lighter structures, while the town's transportation dependence and limited local redundancy increase sensitivity to debris, outages, and temporary isolation. **Impacts:** Tornadoes can damage residences and infrastructure, down trees and utility lines, create hazardous driving conditions on local and interstate routes, and interrupt electric, communications, and emergency access.

Plan Participant	Vulnerabilities and Impacts
	Because Leeds is tied to a major regional corridor, even a short-lived tornado could create wider transportation and safety consequences beyond the town itself while increasing repair and cleanup costs for public works and utility systems. Critical facilities and infrastructure potentially impacted include Leeds Town Hall and public works facilities; Leeds fire and emergency response facilities; water, wastewater, stormwater, drainage, storage, pumping, and utility infrastructure; Interstate 15, Main Street, local roads, bridges, culverts, traffic-control devices, signs, access ramps, evacuation routes, and corridor transportation infrastructure; Leeds Creek, Quail Creek, and nearby drainage corridor infrastructure; overhead and underground electric, communications, fiber, cellular, internet, radio, and utility infrastructure; parks, public buildings, community facilities, corridor businesses, lighter structures, rooftops, windows, signs, vehicles, mechanical systems, antennas, utility poles, overhead lines, and trees vulnerable to tornado winds, windborne debris, roof damage, broken windows, downed lines, power interruptions, hazardous driving conditions, debris on local and interstate routes, access disruption, temporary isolation, and delayed emergency response.
Virgin	**Vulnerabilities:** Virgin is vulnerable because homes, lodging, restaurants, SR-9, utility systems, and visitor-serving facilities in the Zion gateway corridor could be affected by a localized tornado or landspout-type event. Although tornadoes remain infrequent, the town's corridor setting, high seasonal visitation, limited access routes, and concentration of exposed roofs, signs, windows, vehicles, and overhead utilities increase sensitivity where a tornado path intersects developed areas or travel corridors. **Impacts:** Tornadoes can damage tourism-related businesses, residences, vehicles, windows, roofing, signs, and utilities; create debris-blocked roads and hazardous travel on SR-9; and interrupt power, communications, and visitor access. Even a weak tornado could produce outsized economic and operational impacts in a small gateway town because the community depends on tourism, limited transportation redundancy, and uninterrupted access for residents and visitors. Critical facilities and infrastructure potentially impacted include Virgin Town Hall and municipal facilities; Virgin fire and emergency response facilities; public works, water, wastewater, drainage, storage, pumping, and utility infrastructure; State Route 9, local roads, bridges, culverts, traffic-control devices, signs, evacuation routes, and Zion gateway access routes; Virgin River corridor and adjacent transportation and utility infrastructure; overhead and underground electric, communications, fiber, cellular, internet, radio, and utility corridors; lodging, restaurants, visitor-serving businesses, parks, trailheads, campgrounds, recreation access points, public buildings, homes, short-term rentals, rooftops, windows, signs, vehicles, mechanical systems, antennas, utility poles, overhead lines, and trees vulnerable to tornado winds, windborne debris, roof damage, broken windows, downed lines, power and communications outages, SR-9 roadway

Plan Participant	Vulnerabilities and Impacts
	debris, visitor access disruption, tourism business interruption, limited sheltering, and emergency response constraints.
Springdale	**Vulnerabilities:** Springdale is vulnerable because homes, hotels, restaurants, employee housing, roads, utilities, and visitor facilities are concentrated in a narrow Zion gateway corridor where even a weak tornado or landspout-type event could affect a high share of exposed assets. The town's small but concentrated population, constrained SR-9 access, high visitor volumes, and limited shelter and transportation redundancy increase sensitivity to localized tornado wind damage, especially to roofs, windows, vehicles, signs, and utility systems. **Impacts:** Tornadoes can damage lodging, businesses, homes, roads, and utilities; create debris-blocked travel routes; interrupt evacuation and emergency response; and threaten residents, employees, and visitors in exposed buildings or outdoor areas. Even a short-duration tornado could create outsized life-safety and economic consequences because Springdale depends on tourism, visitor circulation, and a single constrained access corridor serving Zion-area destinations. Critical facilities and infrastructure potentially impacted include Springdale Town Hall and municipal facilities; Springdale Police Department and emergency response facilities; public works, water, wastewater, drainage, stormwater, storage, pumping, and utility infrastructure; State Route 9, Zion Canyon access routes, shuttle-related transportation facilities, local roads, bridges, culverts, traffic-control devices, signs, evacuation routes, and visitor access corridors; Virgin River corridor and canyon transportation and utility infrastructure; overhead and underground electric, communications, fiber, cellular, internet, radio, and utility infrastructure; hotels, restaurants, lodging areas, employee housing, visitor facilities, short-term rentals, parks, trailheads, public buildings, Zion gateway recreation assets, public gathering areas, homes, rooftops, windows, signs, vehicles, mechanical systems, antennas, utility poles, overhead lines, and trees vulnerable to tornado winds, windborne debris, roof and window damage, downed lines, power outages, debris-blocked SR-9 access, evacuation constraints, visitor sheltering needs, tourism interruption, and emergency response delays in the constrained canyon corridor.
New Harmony	**Vulnerabilities:** New Harmony is vulnerable because homes, roads, water systems, agricultural buildings, and community facilities in a rural mountain-valley setting could be affected by a localized tornado crossing developed areas or nearby travel corridors. Older structures, outbuildings, overhead utilities, and limited alternate access increase sensitivity to debris, service disruption, and emergency response delays even when tornado intensity remains in the EF0 to EF1 range. **Impacts:** Tornadoes can damage roofs, windows, fences, sheds, water and utility systems, and local roads; create blocked access; and interrupt emergency response, school travel, and local services. Recovery may be slower where staffing and repair resources are limited, and even a brief tornado could create disproportionate disruption if it affects transportation or

Plan Participant	Vulnerabilities and Impacts
	utility lifelines in this small rural community. Critical facilities and infrastructure potentially impacted include New Harmony Town Hall and municipal facilities; fire and emergency response facilities; public works, local and domestic water systems, wells, storage, pumping, wastewater, drainage, and utility infrastructure; Interstate 15, State Route 144, local roads, bridges, culverts, traffic-control devices, signs, evacuation routes, and rural access roads; Ash Creek watershed transportation and utility crossings; power, communications, fiber, cellular, internet, radio, and utility corridors; agricultural and open lands, irrigation systems, livestock water supplies, parks, community facilities, public buildings, homes, older structures, barns, sheds, fences, outbuildings, exposed vehicles and equipment, rooftops, windows, mechanical systems, antennas, utility poles, overhead lines, and trees vulnerable to tornado winds, windborne debris, roof damage, broken windows, downed lines, blocked rural access, utility interruption, school travel disruption, local service interruption, isolation, and delayed emergency response.
Rockville	**Vulnerabilities:** Rockville is vulnerable because of its small historic and residential development pattern along the Virgin River corridor, constrained access routes, and concentration of exposed homes, historic buildings, roads, bridges, and utilities in a narrow gateway setting. Although tornadoes are infrequent, even weak EF0 to EF1 events can damage older or lighter structures, break windows, remove roof materials, and create debris hazards where shelter options and transportation redundancy are limited. **Impacts:** Tornadoes can damage historic and residential structures, utility systems, vehicles, and public spaces; block roads with debris; and interrupt emergency response and visitor access. Because Rockville is small and access is constrained, even localized tornado damage could have outsized effects on life safety, preservation of historic resources, tourism activity, and long-term recovery operations. Critical facilities and infrastructure potentially impacted include Rockville Town Hall and municipal facilities; fire and emergency response facilities; public works, water, wastewater, drainage, storage, pumping, and utility infrastructure; State Route 9, local roads, bridges, culverts, traffic-control devices, signs, evacuation routes, and Zion gateway access routes; Virgin River corridor and adjacent transportation and utility infrastructure; overhead and underground electric, communications, fiber, cellular, internet, radio, and utility infrastructure; historic buildings, homes, parks, trailheads, visitor-serving facilities, public buildings, public spaces, scenic or historic community resources, older or lighter structures, rooftops, windows, signs, vehicles, mechanical systems, antennas, utility poles, overhead lines, and trees vulnerable to tornado winds, windborne debris, roof and structural damage, broken windows, downed lines, blocked roads, emergency access disruption, visitor access disruption, impacts to historic resources, tourism interruption, and extended recovery needs in a constrained gateway corridor.

Plan Participant	Vulnerabilities and Impacts
Apple Valley	**Vulnerabilities:** Apple Valley is vulnerable where dispersed homes, local roads, water systems, utility lines, and community facilities in a rural-residential setting could be intersected by a localized tornado path. The community's modest infrastructure systems, overhead utilities, outbuildings, and distance from some services increase sensitivity to damage and service disruption, particularly where residents may have limited immediate shelter options or where debris blocks access roads. **Impacts:** Tornadoes can damage homes, vehicles, sheds, fences, utility systems, and nearby public facilities; create hazardous travel conditions; and interrupt access to emergency response and essential services. Recovery may be challenging if multiple dispersed neighborhoods are affected at once or if repairs require outside contractors and extended restoration timelines for roads, utilities, and private property. Critical facilities and infrastructure potentially impacted include Apple Valley Town Hall and municipal facilities; fire and emergency response facilities; public works, community water systems, wells, storage, pumping, wastewater, drainage, and utility infrastructure; State Route 59, local roads, bridges, culverts, washes, traffic-control devices, signs, evacuation routes, and rural access roads; power, communications, fiber, cellular, internet, radio, and utility corridors; parks, community facilities, dispersed residential water systems, public buildings, open-space resources, limited agricultural or livestock support infrastructure, maintenance facilities, homes, outbuildings, sheds, fences, exposed vehicles and equipment, rooftops, windows, mechanical systems, antennas, utility poles, and overhead lines vulnerable to tornado winds, windborne debris, roof damage, broken windows, downed lines, road debris, utility interruption, delayed emergency access, service challenges across dispersed neighborhoods, and extended repair timelines requiring outside contractors or assistance.
Hildale	**Vulnerabilities:** Hildale is vulnerable because homes, schools, roads, utility and water systems, and public facilities are concentrated in a rugged terrain setting with limited infrastructure redundancy and a mix of housing types that can be sensitive to localized tornado wind damage. Even though tornadoes remain infrequent, weaker EF0 to EF1 events can still damage roofs, windows, older structures, overhead utilities, and lighter buildings, while constrained access routes may complicate sheltering and response. **Impacts:** Tornadoes can damage homes, schools, utility infrastructure, roads, and community facilities; create debris-blocked access; and interrupt public safety operations, water service, and emergency response. In a community with ongoing infrastructure needs, even a localized tornado could add substantial repair demands and require outside technical and financial assistance to restore services and stabilize affected areas. Critical facilities and infrastructure potentially impacted include Hildale City Hall and municipal facilities; Hildale Police Department; Hildale fire and emergency response facilities; Water Canyon School and other community facilities; public works, culinary water, wastewater, stormwater, drainage, storage, pumping, and

Plan Participant	Vulnerabilities and Impacts
	utility infrastructure; Utah State Route 59, local roads, bridges, culverts, washes, traffic-control devices, signs, community access routes, and evacuation routes; power, communications, fiber, cellular, internet, radio, and utility corridors; parks, public buildings, residential water systems, public landscapes, drainage-sensitive open areas, homes, older structures, lightweight buildings, outbuildings, rooftops, windows, mechanical systems, antennas, utility poles, overhead lines, and vehicles vulnerable to tornado winds, windborne debris, roof and structural damage, broken windows, downed power and communications lines, blocked roads, water and electric service interruption, public safety disruption, school disruption, isolation, delayed emergency response, and increased need for outside technical and financial assistance.

Wildfire

Table 173 summarizes wildfire vulnerabilities and potential impacts for Washington County participants.

Table 173: Wildfire Vulnerability and Impact Assessment for Washington County

Plan Participant	Vulnerabilities and Impacts
Washington County	**Vulnerabilities:** Washington County is highly vulnerable to wildfire because rapid population growth, extensive development in wildland-urban interface areas, fire-prone vegetation, and recurring hot, dry, and windy conditions combine to expose people, property, infrastructure, and natural resources to significant wildfire risk. The county includes rapidly growing communities such as St. George, Washington City, Hurricane, Santa Clara, and Ivins, along with smaller communities such as Pine Valley, Diamond Valley, Veyo, Gunlock, Brookside, and Central where homes, businesses, transportation corridors, utilities, recreation assets, and public facilities interface with grass, shrub, and pinyon-juniper fuels. The 2025 Forsyth Fire burned 15,563 acres and affected the Pine Valley area. For countywide planning context, the county had an estimated 213,670 residents on July 1, 2025, and about 91,460 housing units in 2025 across roughly 2,427.6 square miles, providing inventory context rather than a count of people or housing within the wildland-urban interface.[276][277] **Impacts:** Wildfire can threaten life safety, destroy homes and outbuildings, damage utilities, roads, schools, and critical facilities, force evacuations, and

[276] WUI = wildland-urban interface

[277] U.S. Census Bureau, QuickFacts: Washington County, Utah; July 1, 2025 population and housing estimates (V2025), 2020 Census, and 2020–2024 American Community Survey, as applicable. Age percentages are those reported in QuickFacts. https://www.census.gov/quickfacts/fact/table/washingtoncountyutah/PST045225. Accessed October 10, 2026. NOAA National Centers for Environmental Information, Storm Events Database, annual details CSV files, retrieved October 10, 2026. https://www.ncei.noaa.gov/pub/data/swdi/stormevents/csvfiles/ Event 1278611, Forsyth Fire, June 2025, Southern Mountains forecast zone.

Plan Participant	Vulnerabilities and Impacts
	create prolonged smoke and air quality impacts. Countywide impacts may also include power and communications outages, interruption of tourism and daily travel, loss of business activity, and long-term watershed degradation, erosion, post-fire flooding, and debris-flow risk. The hazard profile notes multiple federal wildfire declarations in Washington County, including the 2025 Forsyth Fire, 2020 Veyo West Fire, 2016 Saddle Fire, 2009 Mill Flat Fire, 2005 Blue Springs Fire, and 2004 Brookside Fire.[278] Critical facilities and infrastructure potentially impacted include Washington County Sheriff's Office; Washington County Emergency Management; St. George 911 Communications Center; Southwest Utah Public Health Department; St. George Regional Hospital; Washington County School District facilities; Utah Tech University facilities; Dixie Technical College facilities; county and municipal government buildings; public safety facilities; fire stations and EMS resources; public works facilities; Interstate 15, State Route 9, State Route 18, State Route 34, State Route 7/Southern Parkway, State Route 59, and other regional roadways, bridges, culverts, evacuation routes, emergency response routes, airport access routes, traffic-control systems, and fuel supply points; St. George Regional Airport; Washington County Water Conservancy District reservoirs, pipelines, pump stations, water storage, treatment, and distribution infrastructure; municipal water, wastewater, stormwater, drainage, irrigation, power, substations, overhead electric distribution lines, communications towers, fiber, cellular, internet, dispatch, and radio systems; parks, trailheads, campgrounds, reservoir recreation facilities, tourism and visitor-serving infrastructure, public buildings, schools, hospitals, clinics, commercial centers, residential neighborhoods, WUI communities, agricultural buildings, sheds, barns, fences, corrals, irrigation equipment, maintenance yards, watershed areas, open space, desert shrubland, pinyon-juniper areas, and public lands vulnerable to direct flame exposure, ember intrusion, smoke, evacuation constraints, structure loss, power and communications outages, road closures, water system damage, utility interruption, recreation closures, tourism disruption, post-fire erosion, sedimentation, flooding, debris flows, and long-term watershed degradation.
St. George	**Vulnerabilities:** St. George is highly vulnerable because of its rapid growth, large population, extensive housing and commercial development, major transportation corridors, utility systems, schools, hospitals, parks, and recreation facilities located at the urban edge where neighborhoods interface with burnable vegetation. As the county's principal urban center, St. George includes a high concentration of exposed structures, public facilities, and lifeline systems that can be threatened by wind-driven wildfire, ember exposure, smoke, and evacuation pressure. The countywide 2025 inventory of 213,670 residents and 91,460 housing units provides planning context; it does not quantify St. George's wildfire or WUI exposure.

[278] FEMA, OpenFEMA Disaster Declarations Summaries, version 2, Utah records, retrieved October 10, 2026. https://www.fema.gov/openfema-data-page/disaster-declarations-summaries-v2 FM declarations 5591, 5321, 5130, 2831, 2564, and 2521, respectively.

Plan Participant	Vulnerabilities and Impacts
	Impacts: Wildfire can damage homes, businesses, schools, medical facilities, roads, utilities, parks, and public infrastructure; force evacuations; degrade air quality; and disrupt emergency response, health care access, commerce, and daily travel. Because St. George functions as the region's main service center, wildfire could also create broader cascading impacts through utility outages, transportation disruption, school and facility closures, and interruption of regional tourism and visitor activity. Post-fire erosion, flooding, and watershed impacts may continue to affect roads, drainage systems, and downstream developed areas after the flames are out. Critical facilities and infrastructure potentially impacted include St. George City Hall (61 S Main St.) and municipal government facilities; St. George Police Department; St. George Fire Department stations (Winchester Hills Station at 5297 N Winchester Hills Dr, Fire Station #5 at 140 N Dixie Dr); St. George 911 Communications Center; St. George Regional Hospital; Hillside Health medical facility (1841 E Riverside Dr, Suite 201); Utah Tech University facilities; Dixie Technical College facilities; Washington County School District schools and support facilities; St. George Regional Airport and airport access infrastructure; public works, water, wastewater, stormwater, drainage, storage, pumping, treatment, and distribution facilities; Interstate 15, State Route 7/Southern Parkway, Bluff Street, River Road, St. George Boulevard, Riverside Drive, Red Hills Parkway, traffic signals, bridges, culverts, evacuation routes, emergency response routes, and major arterials; Washington County Water Conservancy District facilities serving the St. George area; electric substations, overhead and underground power systems, communications, fiber, cellular, internet, radio, and dispatch infrastructure; hospitals, clinics, medical offices, commercial centers, hotels, warehouses, schools, parks, sports fields, trail systems, golf courses, recreation facilities, public buildings, hillside and desert-edge neighborhoods, WUI subdivisions, airport-related facilities, utility corridors, signs, rooftops, mechanical systems, vehicles, and open-space edges vulnerable to direct flame exposure, ember intrusion, smoke, roof and structure loss, downed utility lines, power and communications outages, transportation disruption, airport access disruption, school and medical service interruption, evacuation pressure, business interruption, post-fire erosion, drainage damage, flooding, debris flows, and regional service disruption.
Washington City	**Vulnerabilities:** Washington City is highly vulnerable because growing neighborhoods, schools, parks, commercial areas, roads, utility systems, and public facilities continue to expand into or near fire-prone desert and wildland-urban interface settings. The city's rapid development increases the number of homes, landscaped areas, transportation links, and public assets exposed to fast-moving grass, shrub, and pinyon-juniper fires, especially where communities connect to open space and drainage corridors that can carry fire. Washington County's 2025 totals of 213,670 residents and 91,460 housing units provide countywide planning context, not an estimate of Washington City's WUI population or exposed infrastructure.

Plan Participant	Vulnerabilities and Impacts
	Impacts: Wildfire can threaten homes and community facilities, force evacuations, damage utilities and transportation routes, reduce air quality, and interrupt schools, businesses, and city operations. Even when direct fire damage is localized, smoke, road closures, utility disruption, and post-fire flooding or erosion can create longer-duration impacts for residents and public services while increasing maintenance and recovery costs. Washington City offices (111 N 100 E) and municipal facilities; Washington City Police Department; Washington City Fire Department facilities (250 Buena Vista Blvd); Washington County School District schools and community facilities; public works facilities; culinary water, irrigation, wastewater, stormwater, drainage, storage, pumping, treatment, and distribution infrastructure; Interstate 15, State Route 9, Telegraph Street, Green Spring Drive, Washington Parkway, bridges, culverts, traffic-control devices, evacuation routes, emergency response routes, and major access routes; Washington County Water Conservancy District facilities serving the Washington area; power, communications, fiber, cellular, internet, radio, and utility infrastructure; parks, trail systems, sports fields, commercial centers, public buildings, residential neighborhoods, developing areas, WUI subdivisions, open-space edges, drainage corridors, utility corridors, signs, rooftops, vehicles, mechanical systems, and landscaped areas vulnerable to direct flame exposure, ember intrusion, smoke, structure and roof damage, utility outages, road closures, evacuation constraints, school and business interruption, drainage system damage, post-fire flooding, erosion, debris movement, and increased public works maintenance and recovery costs.
Hurricane	**Vulnerabilities:** Hurricane is highly vulnerable because expanding residential and commercial growth in the Hurricane Valley places more homes, schools, parks, roads, utilities, and public facilities near burnable vegetation and WUI conditions. The city's location near recreation access routes, open space, and foothill terrain increases exposure to fast-moving grass and shrub fires, smoke, and evacuation pressure, especially where neighborhoods and transportation corridors connect directly to wildland fuels. **Impacts:** Wildfire can damage homes, roads, drainage and utility infrastructure, schools, and public facilities; force evacuations; reduce visibility and air quality; and disrupt business activity, recreation travel, and emergency access. Post-fire erosion and debris-flow risk may also affect channels, roads, and stormwater systems after a burn, creating costly recovery and mitigation needs in addition to direct fire suppression and property loss. Critical facilities and infrastructure potentially impacted include Hurricane City Hall and municipal facilities; Hurricane Police Department; Hurricane Valley Fire District facilities (Hurricane City Fire Station #41 202 E State St); Washington County School District schools and community facilities; public works, water, wastewater, stormwater, drainage, irrigation, storage, pumping, treatment, and distribution infrastructure; Interstate 15 access routes, State Route 9, State Route 7/Southern Parkway, State Route 59, local roads, bridges, culverts, traffic-control devices, evacuation routes, emergency response routes, and

Plan Participant	Vulnerabilities and Impacts
	major access corridors; Sand Hollow Reservoir and Quail Creek Reservoir recreation-support, dam, spillway, access, marina, campground, and utility infrastructure; power, communications, fiber, cellular, internet, radio, and utility corridors; parks, trailheads, campgrounds, marinas, commercial areas, tourism businesses, public buildings, developing neighborhoods, WUI subdivisions, open-space edges, utility corridors, signs, rooftops, vehicles, mechanical systems, and recreation assets vulnerable to direct flame exposure, ember intrusion, smoke, evacuation pressure, roof and structure loss, road closures, utility outages, water system disruption, recreation closures, visitor service interruption, post-fire erosion, sedimentation, flooding, debris flows, and emergency response delays.
Santa Clara	**Vulnerabilities:** Santa Clara is highly vulnerable because developed neighborhoods, parks, roads, utilities, public facilities, and open-space edges are exposed to wildfire in a community where homes interface with desert vegetation, benches, and nearby WUI terrain. The city's location within the greater St. George urban area means that even a localized fire can threaten a substantial number of homes, community facilities, and transportation links while smoke and evacuation demands affect surrounding jurisdictions as well. **Impacts:** Wildfire can damage homes, parks, roads, public facilities, utilities, and nearby open-space assets; trigger evacuations; and degrade air quality for residents and schools. Fire may also disrupt local travel, city services, and neighborhood access, while post-fire erosion and runoff can create longer-term impacts to drainageways, roads, and public infrastructure in and around affected slopes or open lands. Critical facilities and infrastructure potentially impacted include Santa Clara City Hall and municipal facilities; Santa Clara-Ivins Police Department facilities; Santa Clara fire and emergency response facilities; Washington County School District schools and community facilities; public works, water, irrigation, wastewater, stormwater, drainage, storage, pumping, treatment, and distribution systems; Old Highway 91, Santa Clara Drive, Pioneer Parkway, local roads, bridges, culverts, traffic-control devices, evacuation routes, emergency response routes, and neighborhood access roads; Santa Clara River corridor infrastructure; power, communications, fiber, cellular, internet, radio, and utility infrastructure; parks, trails, recreation areas, public buildings, commercial areas, neighborhoods, WUI edges, open-space areas, slope-adjacent development, drainage corridors, utility corridors, rooftops, signs, vehicles, mechanical systems, and landscaped areas vulnerable to direct flame exposure, ember intrusion, smoke, structure loss, roof damage, utility outages, road closures, evacuation constraints, neighborhood access disruption, city service interruption, post-fire erosion, runoff, drainage damage, and increased stabilization and cleanup needs.
Ivins	**Vulnerabilities:** Ivins is highly vulnerable because homes, roads, parks, tourism-related amenities, public facilities, and utility systems are situated near desert-edge vegetation, open-space recreation areas, and wildland-urban interface conditions. Continued growth places more structures and visitors in fire-prone settings near foothills and open lands, increasing

Plan Participant	Vulnerabilities and Impacts
	exposure to wind-driven wildfire, smoke, evacuation challenges, and limited transportation redundancy. **Impacts:** Wildfire can damage homes, roads, parks, trails, utilities, and public facilities; interrupt access to neighborhoods and recreation amenities; and create smoke and air quality impacts for residents and visitors. Because Ivins supports tourism, parks, and public events, even localized fire can disrupt community life and visitor activity while post-fire erosion and runoff create longer-term infrastructure and maintenance burdens. Critical facilities and infrastructure potentially impacted include Ivins City Hall (65 West 350 North) and municipal facilities; Santa Clara-Ivins Police Department facilities serving Ivins; Ivins fire and emergency response facilities; Washington County School District schools and community facilities; public works, water, wastewater, stormwater, drainage, irrigation, storage, pumping, treatment, and distribution infrastructure; Old Highway 91, Center Street, Snow Canyon Parkway, local access routes, bridges, culverts, traffic-control devices, evacuation routes, emergency response routes, and neighborhood access roads; overhead and underground power, communications, fiber, cellular, internet, radio, and utility infrastructure; parks, trailheads, recreation facilities, tourism-related amenities, public buildings, desert-edge neighborhoods, WUI subdivisions, open-space edges, foothill areas, utility corridors, rooftops, signs, vehicles, mechanical systems, and trail systems vulnerable to direct flame exposure, ember intrusion, smoke, structure and roof damage, utility outages, road closures, limited access, recreation closures, visitor disruption, neighborhood isolation, post-fire erosion, runoff, debris movement, and public service interruption.
La Verkin	**Vulnerabilities:** La Verkin is highly vulnerable because homes, schools, roads, bridges, utility systems, and public facilities are located in a corridor setting near the Virgin River, steep terrain, and vegetated slopes that can support WUI wildfire spread. Its transportation role, nearby recreation traffic, and proximity to canyon and bench terrain increase sensitivity where fire, smoke, or protective closures affect neighborhoods, roads, or utility corridors. **Impacts:** Wildfire can damage homes, roads, bridges, utility systems, and public facilities; force evacuations; interrupt corridor travel and emergency response; and reduce air quality for residents and travelers. Post-fire runoff, erosion, and debris-flow potential may further damage drainage systems and transportation infrastructure after a burn, creating extended public works and recovery costs. Critical facilities and infrastructure potentially impacted include La Verkin City offices and municipal facilities; La Verkin Police Department; La Verkin fire and emergency response facilities; Washington County School District schools and community facilities; public works, water, wastewater, stormwater, drainage, storage, pumping, treatment, and utility infrastructure; State Route 9, State Route 17, local roads, bridges, culverts, traffic-control devices, evacuation routes, emergency response routes, and Zion gateway access routes; La Verkin Creek, Ash Creek, Virgin River corridor, and adjacent transportation and utility infrastructure; overhead and

Plan Participant	Vulnerabilities and Impacts
	underground electric, communications, fiber, cellular, internet, radio, and utility infrastructure; parks, trailheads, visitor-serving businesses, public buildings, neighborhoods, WUI edges, river- and slope-adjacent facilities, utility corridors, signs, rooftops, vehicles, mechanical systems, and open-space areas vulnerable to direct flame exposure, ember intrusion, smoke, road closures, utility outages, evacuation constraints, Zion gateway travel disruption, public service interruption, post-fire erosion, sedimentation, flooding, debris flows, drainage damage, and emergency access delays.
Enterprise	**Vulnerabilities:** Enterprise is highly vulnerable because of its rural setting, dependence on local roads and utility systems, agricultural lands, livestock operations, irrigated fields, outbuildings, and homes located near fire-prone grass, shrub, and pinyon-juniper vegetation. Limited route redundancy, dispersed development, and the town's reliance on local water, agricultural, and emergency response systems increase exposure where wildfire threatens homes, farms, and travel corridors in or near WUI conditions. **Impacts:** Wildfire can damage homes, barns, corrals, fences, grazing lands, crops, utility systems, and local roads; force evacuations; interrupt school and business access; and reduce air quality for residents and workers. Post-fire impacts may include loss of forage, increased erosion, drainage damage, and prolonged recovery challenges where local staffing and financial resources are limited and restoration depends on outside assistance. Critical facilities and infrastructure potentially impacted include Enterprise City offices and municipal facilities; Enterprise Police Department; Enterprise fire and emergency response facilities; Washington County School District schools and community facilities; public works, municipal and domestic water systems, wells, wastewater, drainage, stormwater, irrigation, storage, pumping, treatment, and agricultural water infrastructure; State Route 18, local roads, bridges, culverts, traffic-control devices, rural access routes, evacuation routes, and emergency response routes; reservoirs, irrigation systems, canals, storage ponds, farms, ranches, barns, sheds, corrals, fencing, fields, livestock water supplies, grazing lands, and agricultural support facilities; power, communications, fiber, cellular, internet, radio, and utility infrastructure; parks, public buildings, maintenance yards, WUI areas, grass, shrub, and pinyon-juniper edges, utility corridors, exposed vehicles, equipment, rooftops, outbuildings, and rural homes vulnerable to direct flame exposure, ember intrusion, smoke, structure and outbuilding loss, fence and agricultural infrastructure damage, utility outages, blocked rural roads, evacuation challenges, livestock and forage impacts, post-fire erosion, drainage damage, and prolonged recovery where local resources are limited.
Toquerville	**Vulnerabilities:** Toquerville is highly vulnerable because growing residential areas, roads, utilities, parks, and public facilities are expanding near fire-prone open land, benches, and drainage corridors that can support fast-moving grass and shrub fires. Continued development increases the number of homes and local infrastructure exposed to wildfire, smoke, and evacuation pressure,

Plan Participant	Vulnerabilities and Impacts
	while limited roadway redundancy may complicate emergency access and reentry. **Impacts:** Wildfire can damage homes, roads, utility systems, public facilities, and open-space assets; force evacuations; interrupt city services; and reduce air quality for residents and nearby communities. Fire may also be followed by erosion, runoff, and debris impacts in drainage corridors, increasing the need for slope, drainage, and roadway repair after suppression activities end. Critical facilities and infrastructure potentially impacted include Toquerville Town Hall and municipal facilities; Toquerville fire and emergency response facilities; public works and utility facilities; Washington County School District schools and community facilities serving the area; culinary water, irrigation, wastewater, stormwater, drainage, storage, pumping, treatment, and distribution infrastructure; State Route 17, Interstate 15 access routes, local roads, bridges, culverts, traffic-control devices, evacuation routes, emergency response routes, and developing neighborhood access roads; Ash Creek and La Verkin Creek watershed drainage infrastructure; power, communications, fiber, cellular, internet, radio, and utility infrastructure; parks, trails, public buildings, visitor-serving facilities, neighborhoods, developing WUI areas, open-space edges, drainage corridors, utility corridors, signs, rooftops, vehicles, mechanical systems, and landscaped areas vulnerable to direct flame exposure, ember intrusion, smoke, roof and structure damage, downed utility lines, outages, road closures, evacuation constraints, neighborhood access disruption, school and city service interruption, post-fire erosion, flooding, debris impacts, and increased public works repair needs.
Leeds	**Vulnerabilities:** Leeds is highly vulnerable because homes, Interstate 15 access, local roads, utility systems, and community facilities are located near steep terrain, desert vegetation, and open travel corridors where wildfire can spread quickly and disrupt regional movement. The town's small size and dependence on a limited number of roadway and utility connections increase sensitivity where fire, smoke, or protective closures affect local access and interstate-related travel. **Impacts:** Wildfire can damage homes, roads, utility infrastructure, and nearby open-space assets; force evacuations; reduce visibility and air quality; and interrupt local and interstate travel. Because Leeds is tied to a major regional transportation corridor, even localized wildfire can create wider safety, transportation, and public works consequences while post-fire erosion and runoff may continue to affect roads and drainage infrastructure. Critical facilities and infrastructure potentially impacted include Leeds Town Hall and public works facilities; Leeds fire and emergency response facilities; water, wastewater, stormwater, drainage, storage, pumping, treatment, and utility infrastructure; Interstate 15, Main Street, local roads, bridges, culverts, traffic-control devices, access ramps, evacuation routes, emergency response routes, and corridor transportation infrastructure; Leeds Creek, Quail Creek, and nearby drainage corridor infrastructure; overhead and underground electric, communications, fiber, cellular, internet, radio, and utility infrastructure; parks,

Plan Participant	Vulnerabilities and Impacts
	public buildings, community facilities, corridor businesses, WUI edges, steep terrain, open-space areas, utility corridors, signs, rooftops, vehicles, mechanical systems, and interstate-related infrastructure vulnerable to direct flame exposure, ember intrusion, smoke, road closures, interstate access disruption, power and communications outages, evacuation constraints, public service interruption, post-fire erosion, runoff, culvert blockage, drainage damage, and delayed emergency response.
Virgin	**Vulnerabilities:** Virgin is highly vulnerable because homes, lodging, restaurants, SR-9, utility systems, and visitor-serving facilities are located in the Zion gateway corridor near fire-prone vegetation, steep slopes, and limited transportation options. The town's small population, heavy visitor use, and reliance on a single primary corridor increase exposure where wildfire or smoke affects local businesses, nearby open lands, and access for residents and travelers. **Impacts:** Wildfire can damage tourism-related businesses, residences, roads, and utilities; force evacuations; interrupt SR-9 access and emergency response; and reduce air quality for residents, workers, and visitors. Economic losses may also extend beyond direct fire damage through lost visitation, temporary closure of tourism services, and the cost of cleanup, slope stabilization, and infrastructure repair after the fire. Critical facilities and infrastructure potentially impacted include Virgin Town Hall and municipal facilities; Virgin fire (Hurricane Valley Fire District at 361 N Pocketville Rd) and emergency response facilities; public works, water, wastewater, drainage, storage, pumping, treatment, and utility infrastructure; State Route 9, local roads, bridges, culverts, traffic-control devices, evacuation routes, emergency response routes, and Zion gateway access routes; Virgin River corridor and adjacent transportation and utility infrastructure; overhead and underground electric, communications, fiber, cellular, internet, radio, and utility corridors; lodging, restaurants, visitor-serving businesses, parks, trailheads, campgrounds, recreation access points, public buildings, homes, short-term rentals, WUI edges, steep terrain, open-space areas, utility corridors, signs, rooftops, vehicles, and mechanical systems vulnerable to direct flame exposure, ember intrusion, smoke, road closures, utility outages, evacuation constraints, SR-9 travel disruption, visitor service interruption, tourism business losses, post-fire erosion, flooding, debris flows, drainage damage, and emergency response constraints.
Springdale	**Vulnerabilities:** Springdale is highly vulnerable because development is concentrated in a narrow Zion gateway corridor with steep slopes, high visitor volumes, constrained transportation access, and direct adjacency to burnable vegetation. Homes, hotels, restaurants, employee housing, roads, bridges, utilities, and visitor facilities are exposed where wildfire can spread through WUI conditions and where smoke, ember intrusion, and protective closures can affect both the community and Zion-related travel. Although Springdale is small, its exposure is amplified by its dependence on SR-9, one of the county's key gateway corridors.

Plan Participant	Vulnerabilities and Impacts
	Impacts: Wildfire can damage lodging, businesses, homes, roads, bridges, and utilities; force evacuations; interrupt Zion access and emergency response; and create major smoke and air quality impacts for residents and visitors. Even a localized wildfire can produce outsized life-safety and economic consequences because the town depends on tourism, a single constrained corridor, and uninterrupted operation of visitor-serving businesses. Post-fire erosion, debris flows, and flooding can also threaten the corridor after the fire is contained. Critical facilities and infrastructure potentially impacted include Springdale Town Hall and municipal facilities; Springdale Police Department and emergency response facilities; public works, water, wastewater, drainage, stormwater, storage, pumping, treatment, and utility infrastructure; State Route 9, Zion Canyon access routes, shuttle-related transportation facilities, local roads, bridges, culverts, traffic-control devices, evacuation routes, emergency response routes, and visitor access corridors; Virgin River corridor and canyon transportation and utility infrastructure; overhead and underground electric, communications, fiber, cellular, internet, radio, and utility infrastructure; hotels, restaurants, lodging areas, employee housing, visitor facilities, short-term rentals, parks, trailheads, public buildings, Zion gateway recreation assets, public gathering areas, homes, WUI edges, canyon slopes, open-space areas, utility corridors, signs, rooftops, vehicles, and mechanical systems vulnerable to direct flame exposure, ember intrusion, smoke, evacuation constraints, SR-9 closure, shuttle and visitor access disruption, power and communications outages, lodging and business interruption, public safety response delays, post-fire erosion, flooding, debris flows, drainage damage, and major tourism-related economic impacts.
New Harmony	**Vulnerabilities:** New Harmony is highly vulnerable because homes, roads, water systems, agricultural lands, and community facilities are located in a rural mountain-valley setting with nearby vegetated slopes and limited alternate access. Wildfire can threaten homes and infrastructure directly and also create smoke, evacuation, and service challenges where local roads, utilities, and emergency response capacity are limited and where post-fire runoff can affect drainageways and transportation links. **Impacts:** Wildfire can damage homes, roads, utility and water infrastructure, agricultural lands, and community facilities; force evacuations; reduce air quality; and interrupt emergency response, school access, and local travel. Post-fire erosion, flooding, and debris can further damage roads, culverts, and water systems, extending recovery timelines and increasing the need for outside technical and financial assistance. Critical facilities and infrastructure potentially impacted include New Harmony Town Hall and municipal facilities; fire and emergency response facilities; public works, local and domestic water systems, wells, storage, pumping, wastewater, drainage, and utility infrastructure; Interstate 15, State Route 144, local roads, bridges, culverts, traffic-control devices, evacuation routes, emergency response routes, and rural access roads; Ash Creek watershed drainage crossings and nearby

Plan Participant	Vulnerabilities and Impacts
	transportation and utility infrastructure; power, communications, fiber, cellular, internet, radio, and utility corridors; agricultural and open lands, irrigation systems, livestock water supplies, parks, community facilities, public buildings, public landscapes, homes, rural WUI areas, mountain-valley slopes, outbuildings, barns, sheds, fences, equipment, utility poles, and overhead lines vulnerable to direct flame exposure, ember intrusion, smoke, structure and outbuilding loss, water system damage, utility outages, blocked rural access, evacuation challenges, post-fire erosion, flooding, debris movement, isolation, and delayed emergency response.
Rockville	**Vulnerabilities:** Rockville is highly vulnerable because of its small historic and residential development pattern along the Virgin River corridor, constrained evacuation routes, and direct proximity to steep slopes and burnable vegetation in the Zion gateway area. Homes, historic resources, roads, bridges, utilities, and public spaces are exposed where wildfire, ember intrusion, smoke, and post-fire runoff can affect both the community and corridor travel. The town's small size and limited infrastructure redundancy increase sensitivity even when a fire affects only a small geographic area. **Impacts:** Wildfire can damage homes, historic resources, roads, bridges, utilities, and public spaces; force evacuations; reduce air quality; and interrupt access for residents and visitors. Because Rockville is small and transportation options are limited, even localized fire can significantly affect life safety, tourism activity, emergency response, and long-term recovery, while post-fire flooding and debris-flow potential may continue to threaten the community after suppression ends. Critical facilities and infrastructure potentially impacted include Rockville Town Hall and municipal facilities; fire and emergency response facilities; public works, water, wastewater, drainage, storage, pumping, treatment, and utility infrastructure; State Route 9, local roads, bridges, culverts, traffic-control devices, evacuation routes, emergency response routes, and Zion gateway access routes; Virgin River corridor and adjacent canyon transportation and utility infrastructure; overhead and underground electric, communications, fiber, cellular, internet, radio, and utility infrastructure; historic buildings, homes, parks, trailheads, visitor-serving facilities, public buildings, public spaces, scenic or historic community resources, WUI edges, canyon slopes, open-space areas, utility corridors, signs, rooftops, vehicles, and mechanical systems vulnerable to direct flame exposure, ember intrusion, smoke, structure loss, impacts to historic resources, power and communications outages, SR-9 travel disruption, constrained evacuation, emergency access disruption, visitor service interruption, post-fire flooding, debris flows, erosion, and extended recovery needs in a constrained gateway corridor.
Apple Valley	**Vulnerabilities:** Apple Valley is highly vulnerable where dispersed residential development, local roads, water systems, utilities, and community facilities are exposed in a rural-residential setting near open land and fire-prone vegetation. The town's modest infrastructure systems, limited access redundancy, and distance from some services increase sensitivity to wildfire,

Plan Participant	Vulnerabilities and Impacts
	smoke, evacuation challenges, and post-fire erosion or flooding affecting roads and utility connections. **Impacts:** Wildfire can damage homes, roads, utility systems, and nearby open-space assets; interrupt access to essential services and emergency response; and degrade air quality for residents. Recovery may be challenging if multiple dispersed neighborhoods are affected at once or if post-fire runoff and erosion further damage roads, drainage crossings, and infrastructure after the initial fire event. Critical facilities and infrastructure potentially impacted include Apple Valley Town Hall and municipal facilities; fire and emergency response facilities; public works, community water systems, wells, storage, pumping, wastewater, drainage, and utility infrastructure; State Route 59, local roads, bridges, culverts, washes, traffic-control devices, evacuation routes, emergency response routes, and rural access roads; power, communications, fiber, cellular, internet, radio, and utility corridors; parks, community facilities, dispersed residential water systems, public buildings, open-space resources, rural-residential neighborhoods, WUI edges, limited agricultural or livestock support infrastructure, maintenance facilities, homes, outbuildings, sheds, fences, exposed vehicles, equipment, utility poles, and overhead lines vulnerable to direct flame exposure, ember intrusion, smoke, structure and outbuilding loss, utility outages, road closures, delayed emergency access, dispersed evacuation challenges, water system interruption, post-fire erosion, flooding, drainage damage, service challenges across dispersed neighborhoods, and extended repair timelines.
Hildale	**Vulnerabilities:** Hildale is highly vulnerable because homes, schools, roads, utility and water systems, and public facilities are located in rugged terrain and drainage-sensitive areas with nearby burnable vegetation and limited infrastructure redundancy. Wildfire can threaten structures, community services, and transportation access directly, while smoke and evacuation demands can be especially difficult in a community with ongoing infrastructure needs and constrained access routes. **Impacts:** Wildfire can damage homes, schools, utility and water infrastructure, roads, and community facilities; force evacuations; interrupt public safety operations; and degrade air quality for residents. Post-fire flooding, erosion, and debris-flow potential may further threaten drainageways, roads, and public infrastructure, creating prolonged recovery demands and a likely need for outside technical and financial assistance. Critical facilities and infrastructure potentially impacted include Hildale City Hall and municipal facilities; Hildale Police Department; Hildale fire (350 Newel Avenue) and emergency response facilities; Water Canyon School and other community facilities; public works, culinary water, wastewater, stormwater, drainage, storage, pumping, treatment, and utility infrastructure; Utah State Route 59, local roads, bridges, culverts, washes, traffic-control devices, community access routes, evacuation routes, and emergency response routes; power, communications, fiber, cellular, internet, radio, and utility corridors; parks, public buildings, residential water systems, public landscapes, drainage-

Plan Participant	Vulnerabilities and Impacts
	sensitive open areas, homes, older structures, rugged terrain, WUI edges, outbuildings, utility poles, overhead lines, vehicles, and equipment vulnerable to direct flame exposure, ember intrusion, smoke, structure loss, school disruption, road blockage, power and communications outages, water and wastewater service interruption, evacuation constraints, post-fire flooding, erosion, debris flows, isolation, delayed emergency response, and increased need for outside technical and financial assistance.

Winter Storms

Table 174 summarizes winter storm vulnerabilities and potential impacts for Washington County participants.

Table 174: Winter Storms Vulnerability and Impact Assessment for Washington County

Plan Participant	Vulnerabilities and Impacts
Washington County	**Vulnerabilities:** Washington County is vulnerable to winter storms because it combines rapidly growing lower-elevation population centers with higher-elevation mountain areas and transportation corridors that are susceptible to snowfall, icy conditions, and cold weather disruption. Although communities such as St. George, Washington, and Hurricane experience less frequent snow accumulation than the higher-elevation counties in the region, even minor winter weather events can create disproportionate impacts because road systems, travel behavior, and infrastructure are less routinely exposed to snow and ice. For countywide planning context, the county has an estimated population of about 213,670 residents, approximately 69,786 households, and roughly 91,460 housing units. These totals are not mapped winter-storm exposure estimates; icy roads, freezing temperatures, localized snowfall, and winter travel disruption can affect different areas during severe events. About 22.4% of the county population is age 65 or older, increasing sensitivity to outages, heating interruptions, and delayed access to medical care. **Impacts:** Winter storms in Washington County are most likely to produce minor to moderate impacts countywide and localized moderate impacts in higher-elevation areas and along major travel corridors, especially during snowfall, freezing temperatures, black ice, and brief but disruptive winter weather events. The most consequential impacts are expected along Interstate 15, State Route 9, State Route 18, and routes connecting lower-elevation communities to higher terrain, where icy roads and reduced visibility can cause crashes, travel delays, freight disruption, delayed emergency response, and interruption of commuter and visitor traffic. Power outages and communications interruptions can affect homes, businesses, schools, public safety facilities, St. George Regional Hospital, and utility systems. Regional winter-weather records may cover forecast zones spanning several counties and do not establish Washington County event or loss totals. Critical facilities

Plan Participant	Vulnerabilities and Impacts
	and infrastructure potentially impacted include Washington County Sheriff's Office; Washington County Emergency Management; St. George 911 Communications Center; Southwest Utah Public Health Department; St. George Regional Hospital; Washington County School District facilities; Utah Tech University facilities; Dixie Technical College facilities; county and municipal government buildings; public safety facilities; fire stations and EMS resources; public works facilities; Interstate 15, State Route 9, State Route 18, State Route 34, State Route 7/Southern Parkway, State Route 59, and other regional roadways, bridges, culverts, traffic-control devices, evacuation routes, emergency response routes, airport access routes, and routes connecting lower-elevation communities to the Pine Valley Mountains and other higher terrain; St. George Regional Airport; electric distribution lines, substations, communications towers, fiber, cellular, internet, dispatch, radio, fuel supply, water, wastewater, stormwater, drainage, and utility systems; schools, hospitals, clinics, public buildings, shelters, senior-serving facilities, parks, trailheads, campgrounds, reservoir recreation facilities, visitor-serving infrastructure, agricultural buildings, barns, sheds, fences, corrals, irrigation systems, livestock water supplies, maintenance yards, exposed vehicles, equipment, utility poles, overhead lines, and rural access routes vulnerable to snow accumulation, black ice, freezing rain, reduced visibility, crashes, road closures, delayed emergency response, power and communications outages, frozen or burst pipes, heating interruption, roof stress in higher-elevation areas, tree limb damage, fuel delivery delays, school and business interruption, tourism disruption, and reduced access to medical care and essential services.
St. George	**Vulnerabilities:** St. George is vulnerable because even though it is a lower-elevation desert city, minor winter weather events can create disproportionate impacts on roads, utilities, schools, hospitals, businesses, and public services that are not routinely exposed to snow and ice. The city contains the county's largest concentration of population, critical facilities, and transportation activity, including major arterials, medical services, airport-related infrastructure, and public facilities that depend on reliable travel conditions and power. The county profile indicates Washington County has about 213,670 residents and 91,460 housing units, providing countywide inventory context rather than a mapped exposure estimate for St. George. **Impacts:** Winter storms can create black ice, hazardous travel, crashes, delayed emergency response, frozen pipes, localized power outages, and disruptions to schools, businesses, hospitals, and regional services centered in St. George. Even short-duration snow or freezing events can interrupt commuter travel, medical access, and commercial activity, while cold temperatures can increase heating demand and create public health concerns for older adults, medically vulnerable residents, and people without reliable shelter or backup power. Critical facilities and infrastructure potentially impacted include St. George City Hall and municipal government facilities; St. George Police Department; St. George Fire Department stations; St. George

Plan Participant	Vulnerabilities and Impacts
	911 Communications Center; St. George Regional Hospital and emergency care facilities; Utah Tech University facilities; Dixie Technical College facilities; Washington County School District schools and support facilities; St. George Regional Airport and airport access infrastructure; public works, water, wastewater, stormwater, drainage, storage, pumping, treatment, and distribution facilities; Interstate 15, State Route 7/Southern Parkway, Bluff Street, River Road, St. George Boulevard, Riverside Drive, Red Hills Parkway, bridges, culverts, traffic signals, evacuation routes, emergency response routes, and major arterials; Washington County Water Conservancy District facilities serving the St. George area; electric substations, overhead and underground power systems, communications, fiber, cellular, internet, radio, dispatch, and fuel supply infrastructure; hospitals, clinics, medical offices, schools, commercial centers, hotels, warehouses, public buildings, parks, sports fields, trail systems, golf courses, recreation facilities, fleet vehicles, maintenance yards, signs, rooftops, mechanical systems, utility poles, overhead lines, and trees vulnerable to black ice, brief snowfall, freezing temperatures, crashes, airport access disruption, delayed emergency response, frozen pipes, localized outages, heating demand spikes, school and business closures, medical access disruption, visitor travel delays, and short-term interruption of regional services.
Washington City	**Vulnerabilities:** Washington City is vulnerable because growing neighborhoods, schools, parks, commercial areas, roads, utility systems, and public facilities can be disrupted by brief snow, freezing temperatures, and black ice even though the city is at lower elevation than the region's mountain communities. Continued growth increases the number of commuters, school routes, and public facilities affected when winter weather reduces road safety or interrupts power and communications. **Impacts:** Winter storms can create dangerous travel on local roads and regional corridors, interrupt schools and city operations, damage landscaping and exposed infrastructure, and increase heating and utility demands. Localized icing or snowfall may also delay emergency response, affect neighborhood access, and create repair and maintenance needs for roads, pipes, and public facilities. Critical facilities and infrastructure potentially impacted include Washington City offices and municipal facilities; Washington City Police Department; Washington City Fire Department facilities; Washington County School District schools and community facilities; public works facilities; culinary water, irrigation, wastewater, stormwater, drainage, storage, pumping, treatment, and distribution infrastructure; Interstate 15, State Route 9, Telegraph Street, Green Spring Drive, Washington Parkway, bridges, culverts, traffic-control devices, evacuation routes, emergency response routes, and major access roads; Washington County Water Conservancy District facilities serving the Washington area; power, communications, fiber, cellular, internet, radio, fuel supply, and utility infrastructure; parks, trail systems, sports fields, commercial centers, public buildings, neighborhoods, developing areas, school routes, fleet vehicles,

Plan Participant	Vulnerabilities and Impacts
	maintenance yards, exposed plumbing, irrigation components, utility poles, overhead lines, signs, landscaped areas, and trees vulnerable to black ice, freezing temperatures, light snow, crashes, delayed emergency response, frozen pipes, localized utility outages, school and city service interruption, neighborhood access disruption, increased heating demand, road treatment needs, and temporary impacts to commerce and public services.
Hurricane	**Vulnerabilities:** Hurricane is vulnerable because homes, schools, businesses, roads, utilities, and public facilities in the Hurricane Valley can be affected by episodic winter weather, especially where freezing temperatures, brief snow, and black ice affect travel to and from higher terrain. The city's growth, school activity, recreation travel, and dependence on roadway connections increase sensitivity to even short-duration winter events. **Impacts:** Winter storms can create hazardous driving conditions, crashes, delayed emergency response, frozen pipes, localized utility disruption, and temporary interruption of schools, businesses, and public services. Cold temperatures and icy roads may also affect recreation travel, increase heating demand, and create added risks for older adults, medically vulnerable residents, and travelers moving between valley and higher-elevation routes. Critical facilities and infrastructure potentially impacted include Hurricane City Hall and municipal facilities; Hurricane Police Department; Hurricane Valley Fire District facilities; Washington County School District schools and community facilities; public works, water, wastewater, stormwater, drainage, irrigation, storage, pumping, treatment, and distribution infrastructure; Interstate 15 access routes, State Route 9, State Route 7/Southern Parkway, State Route 59, local roads, bridges, culverts, traffic-control devices, evacuation routes, emergency response routes, and higher-terrain access routes; Sand Hollow Reservoir and Quail Creek Reservoir recreation-support, dam, spillway, access, marina, campground, and utility infrastructure; power, communications, fiber, cellular, internet, radio, fuel supply, and utility corridors; parks, trailheads, campgrounds, marinas, commercial areas, tourism businesses, public buildings, schools, neighborhoods, recreation access roads, fleet vehicles, maintenance yards, exposed plumbing and irrigation systems, utility poles, overhead lines, signs, and trees vulnerable to icy roads, black ice, freezing temperatures, brief snow, crashes, delayed emergency response, recreation travel disruption, frozen pipes, power or communications outages, increased heating demand, school and business interruption, visitor access disruption, and road treatment and recovery costs.

Plan Participant	Vulnerabilities and Impacts
Santa Clara	**Vulnerabilities:** Santa Clara is vulnerable because homes, schools, parks, roads, utility systems, and public facilities in the greater St. George urban area may be affected by freezing temperatures, black ice, and occasional snow or sleet despite the city's lower-elevation setting. Because winter driving conditions are less common, even minor icing can quickly affect road safety, school transportation, and access to community services. **Impacts:** Winter storms can create dangerous local travel conditions, interrupt schools and city functions, damage exposed irrigation or plumbing systems, and increase heating demand and utility stress. Even brief winter weather events may also affect neighborhood access, slow emergency response, and create maintenance burdens for roads, public facilities, and landscaping. Critical facilities and infrastructure potentially impacted include Santa Clara City Hall and municipal facilities; Santa Clara-Ivins Police Department facilities; Santa Clara fire and emergency response facilities; Washington County School District schools and community facilities; public works, water, irrigation, wastewater, stormwater, drainage, storage, pumping, treatment, and distribution systems; Old Highway 91, Santa Clara Drive, Pioneer Parkway, local roads, bridges, culverts, traffic-control devices, evacuation routes, emergency response routes, and neighborhood access roads; Santa Clara River corridor infrastructure; power, communications, fiber, cellular, internet, radio, fuel supply, and utility infrastructure; parks, trails, recreation areas, public buildings, commercial areas, neighborhoods, school routes, fleet vehicles, maintenance yards, exposed plumbing, irrigation systems, landscaped areas, utility poles, overhead lines, signs, and trees vulnerable to freezing temperatures, black ice, brief snow or sleet, crashes, delayed emergency response, frozen pipes, irrigation system damage, localized outages, school and city service interruption, neighborhood access disruption, increased heating demand, and short-term maintenance burdens for roads, public facilities, and landscaping.
Ivins	**Vulnerabilities:** Ivins is vulnerable because homes, roads, parks, public facilities, tourism-related amenities, and utility systems can be affected by episodic winter weather, especially when freezing temperatures, ice, or light snow affect travel to and from higher terrain and exposed desert-edge roads. Although snowfall is less frequent than in higher-elevation communities, the city's growing population, public events, and recreation-related travel can amplify disruption when winter conditions occur. **Impacts:** Winter storms can create icy roads, travel delays, localized utility and communications interruptions, frozen pipes, and temporary disruption to public services, schools, and recreation access. Cold conditions may also increase heating demand and create public health risks for older adults, residents without reliable heating, and people engaged in outdoor activities or travel during sudden weather changes. Critical facilities and infrastructure potentially impacted include Ivins City Hall and municipal facilities; Santa Clara-Ivins Police Department facilities serving Ivins; Ivins fire and emergency response facilities; Washington County School District schools and community

Plan Participant	Vulnerabilities and Impacts
	facilities; public works, water, wastewater, stormwater, drainage, irrigation, storage, pumping, treatment, and distribution infrastructure; Old Highway 91, Center Street, Snow Canyon Parkway, local access routes, bridges, culverts, traffic-control devices, evacuation routes, emergency response routes, and desert-edge roads; overhead and underground power, communications, fiber, cellular, internet, radio, fuel supply, and utility infrastructure; parks, trailheads, recreation facilities, tourism-related amenities, public buildings, neighborhoods, school routes, fleet vehicles, maintenance yards, exposed plumbing, irrigation systems, utility poles, overhead lines, signs, rooftops, mechanical systems, and trees vulnerable to freezing temperatures, black ice, light snow, travel delays, recreation access disruption, frozen pipes, localized power or communications outages, public service interruption, neighborhood access constraints, increased heating demand, and risks to older adults, residents without reliable heating, and outdoor recreation users during sudden winter weather changes.
La Verkin	**Vulnerabilities:** La Verkin is vulnerable because homes, schools, roads, bridges, utilities, and public facilities are located in a corridor setting where freezing temperatures, black ice, and occasional snow can affect travel between lower and higher-elevation portions of the county. The community's transportation connections, bridge crossings, and overhead infrastructure increase sensitivity to winter driving hazards and service disruption during cold or icy events. **Impacts:** Winter storms can create hazardous travel on local roads and corridor routes, delay emergency response, disrupt schools and public services, and damage exposed plumbing, utilities, and outdoor infrastructure. Even brief periods of snow or ice can affect commuter travel, visitor movement, and access to neighboring communities while increasing maintenance and response costs. Critical facilities and infrastructure potentially impacted include La Verkin City offices and municipal facilities; La Verkin Police Department; La Verkin fire and emergency response facilities; Washington County School District schools and community facilities; public works, water, wastewater, stormwater, drainage, storage, pumping, treatment, and utility infrastructure; State Route 9, State Route 17, local roads, bridges, culverts, traffic-control devices, evacuation routes, emergency response routes, and Zion gateway access routes; La Verkin Creek, Ash Creek, Virgin River corridor, and adjacent transportation and utility infrastructure; overhead and underground electric, communications, fiber, cellular, internet, radio, fuel supply, and utility infrastructure; parks, trailheads, visitor-serving businesses, public buildings, neighborhoods, school routes, fleet vehicles, maintenance yards, exposed plumbing, drainage components, utility poles, overhead lines, signs, and trees vulnerable to black ice, freezing temperatures, brief snow, reduced visibility, crashes, bridge or corridor access disruption, delayed emergency response, frozen pipes, power and communications outages, school and public service disruption, visitor travel delays, and increased maintenance and road treatment demands.

Plan Participant	Vulnerabilities and Impacts
Enterprise	**Vulnerabilities:** Enterprise is highly vulnerable because of its higher-elevation rural setting, dependence on local roads and utility systems, agricultural lands, schools, and homes exposed to snowfall, prolonged cold, and icy travel conditions. As in the winter storms profile, Washington County's higher-elevation communities experience the county's most significant winter storm effects, and Enterprise's limited route redundancy, rural infrastructure, and smaller service base increase sensitivity when snow or ice disrupts access and operations. **Impacts:** Winter storms can create snow-covered and icy roads, delayed emergency response, frozen pipes, localized power outages, disruption to schools and businesses, and hazardous conditions for agricultural operations and livestock care. Recovery may be prolonged where local staffing and equipment are limited, and even short-duration closures or outages can affect a large share of the community's travel, utility service, and continuity of operations. Critical facilities and infrastructure potentially impacted include Enterprise City offices and municipal facilities; Enterprise Police Department; Enterprise fire and emergency response facilities; Washington County School District schools and community facilities; public works, municipal and domestic water systems, wells, wastewater, drainage, stormwater, irrigation, storage, pumping, treatment, and agricultural water infrastructure; State Route 18, local roads, bridges, culverts, traffic-control devices, snow-removal routes, rural access routes, evacuation routes, and emergency response routes; reservoirs, irrigation systems, canals, storage ponds, farms, ranches, barns, sheds, corrals, fencing, fields, livestock water supplies, and agricultural support facilities; power, communications, fiber, cellular, internet, radio, fuel supply, and utility infrastructure; parks, public buildings, maintenance yards, exposed vehicles, equipment, school buses, utility poles, overhead lines, antennas, rooftops, plumbing, and water or sewer components vulnerable to snow accumulation, prolonged cold, black ice, freezing rain, reduced visibility, road closures, delayed emergency response, frozen or burst pipes, heating interruptions, localized power and communications outages, livestock care challenges, agricultural disruption, school and business closures, isolation, and prolonged recovery where local staffing, equipment, and financial resources are limited.
Toquerville	**Vulnerabilities:** Toquerville is vulnerable because growing residential areas, roads, utility systems, and public facilities can be affected by winter weather that creates black ice, occasional snow, and freezing temperatures along local and regional travel routes. Even though snowfall is less frequent than in higher-elevation communities, the town's roads, expanding neighborhoods, and limited route redundancy can make short-duration winter weather events disruptive.

Plan Participant	Vulnerabilities and Impacts
	Impacts: Winter storms can create hazardous road conditions, delayed emergency response, school and commuter disruption, frozen pipes, and temporary outages or communications interruption. Cold weather may also increase heating demand and maintenance needs for roads, drainage crossings, and public facilities while creating public safety concerns for residents and travelers. Critical facilities and infrastructure potentially impacted include Toquerville Town Hall and municipal facilities; Toquerville fire and emergency response facilities; public works and utility facilities; Washington County School District schools and community facilities serving the area; culinary water, irrigation, wastewater, stormwater, drainage, storage, pumping, treatment, and distribution infrastructure; State Route 17, Interstate 15 access routes, local roads, bridges, culverts, traffic-control devices, evacuation routes, emergency response routes, and developing neighborhood access roads; Ash Creek and La Verkin Creek watershed drainage infrastructure; power, communications, fiber, cellular, internet, radio, fuel supply, and utility infrastructure; parks, trails, public buildings, visitor-serving facilities, neighborhoods, school routes, fleet vehicles, maintenance yards, exposed plumbing, irrigation components, utility poles, overhead lines, signs, and trees vulnerable to black ice, freezing temperatures, occasional snow, crashes, delayed emergency response, frozen pipes, temporary outages, communications interruption, school and commuter disruption, neighborhood access disruption, increased heating demand, and added maintenance needs for roads, drainage crossings, and public facilities.
Leeds	**Vulnerabilities:** Leeds is vulnerable because homes, Interstate 15 access, local roads, utility systems, and community facilities are exposed to episodic winter weather in a terrain-constrained corridor where black ice, light snow, and reduced visibility can quickly affect travel safety. The town's connection to Interstate 15 and limited local redundancy means even minor winter weather can create outsized transportation and access consequences. **Impacts:** Winter storms can create dangerous local and interstate travel, crashes, utility disruption, frozen pipes, and delayed emergency access. Because Leeds is tied to a major regional corridor, even brief icing or snowfall can affect commuter movement, freight travel, and public safety beyond the town itself while increasing maintenance and incident response demands. Critical facilities and infrastructure potentially impacted include Leeds Town Hall and public works facilities; Leeds fire and emergency response facilities; water, wastewater, stormwater, drainage, storage, pumping, treatment, and utility infrastructure; Interstate 15, Main Street, local roads, bridges, culverts, traffic-control devices, access ramps, evacuation routes, emergency response routes, and corridor transportation infrastructure; Leeds Creek, Quail Creek, and nearby drainage corridor infrastructure; overhead and underground electric, communications, fiber, cellular, internet, radio, fuel supply, and utility infrastructure; parks, public buildings, community facilities, corridor businesses, school routes, fleet vehicles, maintenance yards, exposed plumbing, drainage components, utility poles, overhead lines, signs, and trees

Plan Participant	Vulnerabilities and Impacts
	vulnerable to black ice, light snow, freezing temperatures, reduced visibility, crashes, interstate and local access disruption, delayed emergency response, frozen pipes, power or communications outages, freight and commuter delays, public service interruption, and increased maintenance and incident response demands.
Virgin	**Vulnerabilities:** Virgin is vulnerable because homes, lodging, restaurants, SR-9, utility systems, and visitor-serving facilities in the Zion gateway corridor depend on a limited transportation network that can be disrupted by snow, black ice, freezing temperatures, and reduced visibility. Although lower elevations receive less snow than mountain communities, even brief winter weather can affect visitor travel, local access, and emergency response in this small corridor town. **Impacts:** Winter storms can create hazardous travel on SR-9, delay emergency response, interrupt visitor access and local commerce, and cause localized utility outages or plumbing issues during freezing conditions. Because Virgin depends on tourism and limited roadway redundancy, even short-lived winter weather can create outsized economic and operational consequences for residents, businesses, and travelers. Critical facilities and infrastructure potentially impacted include Virgin Town Hall and municipal facilities; Virgin fire and emergency response facilities; public works, water, wastewater, drainage, storage, pumping, treatment, and utility infrastructure; State Route 9, local roads, bridges, culverts, traffic-control devices, evacuation routes, emergency response routes, and Zion gateway access routes; Virgin River corridor and adjacent transportation and utility infrastructure; overhead and underground electric, communications, fiber, cellular, internet, radio, fuel supply, and utility corridors; lodging, restaurants, visitor-serving businesses, parks, trailheads, campgrounds, recreation access points, public buildings, homes, short-term rentals, school routes, fleet vehicles, maintenance yards, exposed plumbing, utility poles, overhead lines, signs, and trees vulnerable to black ice, freezing temperatures, brief snow, reduced visibility, SR-9 travel disruption, crashes, delayed emergency response, frozen pipes, localized power and communications outages, visitor access disruption, business interruption, limited sheltering needs, and increased maintenance and road treatment demands.
Springdale	**Vulnerabilities:** Springdale is highly vulnerable because development is concentrated in a narrow Zion gateway corridor with constrained SR-9 access, steep terrain, high visitor volumes, and dependency on uninterrupted travel and utility service. Even brief snow, black ice, or freezing rain can have outsized consequences because hotels, restaurants, homes, roads, bridges, utilities, and visitor facilities all rely on limited transportation redundancy and year-round park access. **Impacts:** Winter storms can create dangerous or impossible travel on SR-9, delay evacuations and emergency response, interrupt tourism activity and local commerce, and affect utilities, plumbing, and facility operations. Because Springdale serves as a Zion gateway, even minor winter weather can produce

Plan Participant	Vulnerabilities and Impacts
	major economic and operational disruption for residents, employees, and visitors while increasing snow removal, treatment, and recovery costs. Critical facilities and infrastructure potentially impacted include Springdale Town Hall and municipal facilities; Springdale Police Department and emergency response facilities; public works, water, wastewater, drainage, stormwater, storage, pumping, treatment, and utility infrastructure; State Route 9, Zion Canyon access routes, shuttle-related transportation facilities, local roads, bridges, culverts, traffic-control devices, evacuation routes, emergency response routes, and visitor access corridors; Virgin River corridor and canyon transportation and utility infrastructure; overhead and underground electric, communications, fiber, cellular, internet, radio, fuel supply, and utility infrastructure; hotels, restaurants, lodging areas, employee housing, visitor facilities, short-term rentals, parks, trailheads, public buildings, Zion gateway recreation assets, public gathering areas, fleet vehicles, shuttle stops, maintenance yards, exposed plumbing, utility poles, overhead lines, signs, rooftops, and trees vulnerable to snow, freezing rain, black ice, reduced visibility, SR-9 closure or restriction, shuttle and visitor access disruption, crashes, delayed emergency response, frozen pipes, heating interruption, power and communications outages, lodging and business interruption, visitor sheltering needs, evacuation constraints, and major tourism-related economic impacts.
New Harmony	**Vulnerabilities:** New Harmony is highly vulnerable because of its higher-elevation rural mountain-valley setting, limited alternate access, homes, roads, water systems, agricultural lands, and community facilities exposed to snow, prolonged cold, and icy travel conditions. Winter storms can affect both local residents and through-travelers, and the town's smaller infrastructure base increases sensitivity when road or utility disruptions occur. **Impacts:** Winter storms can create snow-covered and icy roads, delayed emergency response, disruption to schools and local services, frozen pipes, and localized power or communications outages. Cold conditions may also affect livestock and agricultural operations, increase heating demand, and prolong recovery where road treatment, snow removal, and repair resources are limited. Critical facilities and infrastructure potentially impacted include New Harmony Town Hall and municipal facilities; fire and emergency response facilities; public works, local and domestic water systems, wells, storage, pumping, wastewater, drainage, and utility infrastructure; Interstate 15, State Route 144, local roads, bridges, culverts, traffic-control devices, snow-removal routes, evacuation routes, emergency response routes, and rural access roads; Ash Creek watershed drainage crossings and nearby transportation and utility infrastructure; power, communications, fiber, cellular, internet, radio, fuel supply, and utility corridors; agricultural and open lands, irrigation systems, livestock water supplies, parks, community facilities, public buildings, homes, rural development, barns, sheds, fences, exposed vehicles, equipment, plumbing, utility poles, overhead lines, antennas, and maintenance facilities vulnerable to snow accumulation, prolonged cold, black

Plan Participant	Vulnerabilities and Impacts
	ice, reduced visibility, road closures, delayed emergency response, frozen or burst pipes, power and communications outages, heating interruption, livestock and agricultural impacts, school and service disruption, isolation, and prolonged recovery where road treatment, snow removal, and repair resources are limited.
Rockville	**Vulnerabilities:** Rockville is vulnerable because of its small residential and historic development pattern along the Virgin River corridor, constrained transportation access, and dependence on limited local utilities and road connections in the Zion gateway area. Even brief snow, black ice, or freezing temperatures can affect the town's narrow road network, visitor movement, and access for emergency services, especially where older buildings and exposed infrastructure are less resilient to cold and freezing conditions. **Impacts:** Winter storms can create hazardous travel, delay emergency response, interrupt access for residents and visitors, and affect roads, bridges, utilities, and plumbing in older structures. Because Rockville is small and transportation options are limited, even a minor winter weather event can disrupt tourism, daily activity, and local services while increasing maintenance and recovery needs. Critical facilities and infrastructure potentially impacted include Rockville Town Hall and municipal facilities; fire and emergency response facilities; public works, water, wastewater, drainage, storage, pumping, treatment, and utility infrastructure; State Route 9, local roads, bridges, culverts, traffic-control devices, evacuation routes, emergency response routes, and Zion gateway access routes; Virgin River corridor and adjacent transportation and utility infrastructure; overhead and underground electric, communications, fiber, cellular, internet, radio, fuel supply, and utility infrastructure; historic buildings, homes, parks, trailheads, visitor-serving facilities, public buildings, public spaces, scenic or historic community resources, older structures, short-term rentals, school routes, fleet vehicles, maintenance yards, exposed plumbing, utility poles, overhead lines, signs, and trees vulnerable to black ice, freezing temperatures, brief snow, reduced visibility, hazardous travel, delayed emergency response, frozen pipes, localized outages, damage to older plumbing or buildings, constrained evacuation or access, visitor disruption, tourism interruption, and increased maintenance and recovery needs.
Apple Valley	**Vulnerabilities:** Apple Valley is vulnerable because dispersed homes, local roads, water systems, utility lines, and community facilities in a rural-residential setting can be affected by freezing temperatures, ice, and occasional winter precipitation. The town's distance from some services, limited roadway redundancy, and modest infrastructure systems increase sensitivity when black ice, road closure, or utility disruption occurs. **Impacts:** Winter storms can create hazardous road conditions, delay emergency response, interrupt access to essential services, freeze plumbing or water infrastructure, and cause localized power or communications outages. Recovery may be challenging if multiple dispersed neighborhoods are affected at once or if road treatment and utility repair require outside support

Plan Participant	Vulnerabilities and Impacts
	and extended response time. Critical facilities and infrastructure potentially impacted include Apple Valley Town Hall and municipal facilities; fire and emergency response facilities; public works, community water systems, wells, storage, pumping, wastewater, drainage, and utility infrastructure; State Route 59, local roads, bridges, culverts, washes, traffic-control devices, evacuation routes, emergency response routes, and rural access roads; power, communications, fiber, cellular, internet, radio, fuel supply, and utility corridors; parks, community facilities, dispersed residential water systems, public buildings, open-space resources, limited agricultural or livestock support infrastructure, maintenance facilities, rural-residential neighborhoods, school routes, exposed vehicles, equipment, plumbing, utility poles, overhead lines, antennas, signs, and drainage crossings vulnerable to freezing temperatures, black ice, occasional winter precipitation, road closures, delayed emergency access, frozen pipes, water system interruption, localized power or communications outages, service challenges across dispersed neighborhoods, increased heating demand, and extended response or repair timelines requiring outside support.
Hildale	**Vulnerabilities:** Hildale is vulnerable because homes, schools, roads, utility and water systems, and public facilities are located in rugged terrain and drainage-sensitive areas where freezing temperatures, ice, and occasional snow can affect travel and service delivery. Limited infrastructure redundancy and constrained access routes increase sensitivity to winter weather, especially where residents rely on local systems with less backup capacity. **Impacts:** Winter storms can create icy roads, delayed emergency response, utility and water service interruptions, frozen pipes, and disruption to schools and public safety operations. In a community with ongoing infrastructure needs, even brief winter weather can increase repair demands, isolate neighborhoods, and require outside technical and financial assistance to restore access and services. Critical facilities and infrastructure potentially impacted include Hildale City Hall and municipal facilities; Hildale Police Department; Hildale fire and emergency response facilities; Water Canyon School and other community facilities; public works, culinary water, wastewater, stormwater, drainage, storage, pumping, treatment, and utility infrastructure; Utah State Route 59, local roads, bridges, culverts, washes, traffic-control devices, community access routes, evacuation routes, and emergency response routes; power, communications, fiber, cellular, internet, radio, fuel supply, and utility corridors; parks, public buildings, residential water systems, public landscapes, drainage-sensitive open areas, homes, older structures, school routes, fleet vehicles, maintenance yards, exposed plumbing, utility poles, overhead lines, antennas, signs, and water or sewer components vulnerable to freezing temperatures, black ice, occasional snow, reduced visibility, road blockage, delayed emergency response, frozen or burst pipes, water and wastewater service interruption, power and communications outages, school and public safety disruption, neighborhood

Plan Participant	Vulnerabilities and Impacts
	isolation, increased repair demands, and need for outside technical and financial assistance.

Changes in Development

Changes in development include recent and planned development, including population changes and future conditions, which may affect the risks and vulnerabilities of the plan participants. Understanding how development can be impacted by the natural hazards profiled in this plan can help participants make sound development decisions, identify necessary mitigation actions, and reduce risk to both new and existing structures.

Washington County has experienced substantial population growth between the 2020 Census and the July 1, 2025 estimate. Growth may increase exposure when new people, structures, infrastructure, or visitor-serving uses are located within documented hazard-prone areas. Population or construction growth alone does not establish increased vulnerability; the determination must consider development location, hazard extent, design and land-use controls, infrastructure capacity, completed mitigation, and whether expected consequences changed.

Table 175 distinguishes potential effects of future development from observed changes since the previous plan. The available records do not identify development locations, jurisdiction-owned assets outside the planning area, or completed mitigation by participant sufficiently to determine increased, unchanged, or decreased vulnerability. An indeterminate finding is not a finding of unchanged vulnerability.

Table 175: Vulnerability Changes in Washington County

Plan Participant	Increased	Stayed the Same	Decreased
All Washington County participants	Potential added exposure to flooding, wildfire, drought, extreme heat, damaging winds, problem soils, earthquakes, and other applicable hazards if development adds people or assets in hazard-prone settings. Participant-specific observed increases are not established.	Indeterminate: available participant-specific development and mitigation records do not establish whether vulnerability stayed the same.	No decrease is established by the available participant-specific records.

Capability Assessment

The **capability assessment** defines the resources available to support mitigation. A thorough assessment of current mitigation capabilities helps outline who will be responsible for implementing mitigation actions, what current programs, policies, and funding sources could support action implementation, and

what new capacity building actions could benefit the community. The local capability inventory describes the planning and administrative framework reported in the annex. Dated ordinance, staffing, and implementation records are not available to independently establish each entry's current status; the inventory does not demonstrate NFIP enforcement or completion of individual mitigation actions.

Washington County Capability Assessment

Table 176 describes the mitigation capabilities for Washington County.

Table 176: Washington County Capability Assessment

Capability	Description
Plans and Regulations	General Plan -Amended August 2012, Public Lands portion approved on Nov. 16, 2010 Capital Improvement Plan – 2024–2029 Washington County supports mitigation through its General Plan, community plans for unincorporated areas, zoning and subdivision regulations, building permitting, transportation planning, and adopted ordinances that guide growth in hazard-prone areas. These tools provide a framework for incorporating hazard information into land use decisions, capital improvements, infrastructure siting, and development review.
Administrative and Technical	Administrative and technical capability is provided through county leadership, emergency management, planning and zoning, building services, public works and road functions, GIS[279] and mapping support, coordination with special service districts, and relationships with state and federal partners. The county can convene multiple jurisdictions, maintain hazard information, support project scoping, and coordinate mitigation activities across unincorporated communities and regional service providers.
Financial	Financial capability includes annual budgeting, capital improvement programming, utility and service district investments, grant administration capacity, and the ability to pursue federal and state assistance such as FEMA mitigation programs, state emergency management grants, transportation funds, and other infrastructure and resilience funding sources. County resources are finite, but the county can often combine local funds with outside grants for higher-cost projects.
Education and Outreach	Washington County has education and outreach capability through emergency notifications, public meetings, website content, social media, coordination with local jurisdictions and fire districts, preparedness campaigns, and public information shared during hazard events. Outreach can support wildfire preparedness, flood awareness, drought conservation,

[279] GIS = geographic information system

Capability	Description
	earthquake readiness, radon education, and other community risk-reduction measures.
National Flood Insurance Program	FEMA lists Washington County as an NFIP-participating community (Community 490224). The effective-map field is recorded as 04/02/09; this is not a local ordinance-adoption date. No CRS class is reported in this entry. The status book establishes program status, not local permitting, enforcement, or substantial-improvement/substantial-damage implementation. Participant-specific implementation records and repetitive-loss/severe-repetitive-loss building counts and types are not established by the available evidence; no zero count or finding of compliance is inferred.[280]

The hazard mitigation plan must describe the opportunities to expand and improve upon the capabilities described in the plan. For Washington County, this includes:

- **Plans and Regulations:** Continue integrating hazard information into county land use decisions, update ordinances as needed to address development in hazard-prone areas, and strengthen links between the mitigation plan, transportation planning, capital improvements, and community plans.
- **Administrative and Technical:** Expand geographic information system (GIS)-based risk analysis, maintain updated inventories of critical facilities and infrastructure, improve coordination with participating jurisdictions, and continue training staff and partners on mitigation project development and implementation.
- **Financial:** Identify local match strategies, pursue additional FEMA and state grants, coordinate regional applications where appropriate, and prioritize mitigation projects in capital planning and annual budgeting.
- **Education and Outreach:** Formalize recurring outreach on high-priority hazards, improve multilingual and accessible risk communication where feasible, and coordinate public messaging with municipalities, utilities, fire districts, and school partners.
- **National Flood Insurance Program:** Maintain floodplain management compliance in applicable areas, support map updates and local ordinance review, and improve coordination with participating communities on repetitive flood risk reduction and public flood awareness.

[280] FEMA, OpenFEMA NFIP Community Status Book, Utah records, retrieved October 10, 2026; dataset refresh August 25, 2026. https://www.fema.gov/api/open/v1/NfipCommunityStatusBook. Map dates are FEMA effective-map entries, not evidence of local adoption or implementation.

St. George Capability Assessment

Table 177 describes the mitigation capabilities for St. George.

Table 177: St. George Capability Assessment

Capability	Description
Plans and Regulations	General Plan -June 19, 2025 St. George has strong planning and regulatory capability through its adopted General Plan, zoning and subdivision regulations, building and construction codes, development review procedures, and city ordinances that guide growth, infrastructure, and public safety. These tools support hazard mitigation by helping the city evaluate development in flood-prone drainage corridors, erosion areas, hillside and wildfire-interface locations, and other hazard-sensitive areas; coordinate land use with water, transportation, and utility planning; and apply standards that reduce risk as the city continues to grow.
Administrative and Technical	Administrative and technical capability is supported by city leadership; community development, planning and zoning, engineering, and building functions; public works, utilities, and stormwater management; emergency management and public safety coordination; and access to GIS, hazard mapping, consultant support, and regional, state, and federal technical resources. St. George can evaluate hazard information, review site-specific development constraints, maintain and use drainage and flood risk information, scope mitigation projects, and coordinate implementation across departments and partner agencies.
Financial	Financial capability includes annual budgeting, capital improvement planning, utility and stormwater investments, development-related revenues where applicable, and the ability to pursue state and federal grants and other outside funding for drainage, transportation, public safety, water conservation, wildfire risk reduction, and resilience projects. As a fast-growing regional center with significant infrastructure demands, St. George can support mitigation through phased local investment and by combining city funds with external grant resources for larger projects.
Education and Outreach	St. George has robust education and outreach capability through city websites and public information, emergency alerts, public meetings, social media, utility and conservation messaging, development and permitting guidance, and coordination with community organizations and regional partners. These outreach tools can support flood safety, storm preparedness, drought and water conservation, wildfire defensible space, extreme heat awareness, and household preparedness for residents, businesses, and visitors.
National Flood Insurance Program	FEMA lists St. George as an NFIP-participating community (Community 490177). The effective-map field is recorded as 04/02/09; this is not a local ordinance-adoption date. FEMA reports CRS Class 6, with original entry on

Capability	Description
	1994-10-01 and the current class effective 2024-10-01. The status book establishes program status, not local permitting, enforcement, or substantial-improvement/substantial-damage implementation. Participant-specific implementation records and repetitive-loss/severe-repetitive-loss building counts and types are not established by the available evidence; no zero count or finding of compliance is inferred.[281]

The hazard mitigation plan must describe the opportunities to expand and improve upon the capabilities described in the plan. For St. George, this includes:

- **Plans and Regulations:** Continue integrating hazard data into development review, update ordinances and design standards as needed for drainage corridors, hillside development, wildfire-interface areas, and other hazard-prone locations, and align mitigation priorities with the city's general plan, capital improvement programming, utility planning, and transportation planning.
- **Administrative and Technical:** Expand GIS-based risk analysis, maintain updated inventories of critical facilities, stormwater assets, and other vulnerable infrastructure, improve interdepartmental coordination among planning, engineering, utilities, public works, and emergency management, and continue staff training on mitigation project development, benefit-cost considerations, and hazard-informed planning.
- **Financial:** Develop project-ready mitigation concepts for grant opportunities, identify local match strategies, continue incorporating resilience improvements into capital, drainage, transportation, water, and public safety investments, and prioritize projects that can leverage city funds with state and federal assistance.
- **Education and Outreach:** Expand recurring public communication on flood safety, flash flooding, wildfire defensible space, drought and water conservation, extreme heat, and household preparedness; improve outreach to new residents and businesses; and ensure public messaging remains timely, accessible, and coordinated across city departments and regional partners.
- **National Flood Insurance Program:** Maintain local floodplain management compliance, improve floodplain documentation and public information, continue coordinating on map updates, drainage planning, and erosion hazard management, and identify opportunities to reduce repetitive flood risk and improve resilience in mapped flood hazard areas and along drainage corridors.

[281] FEMA, OpenFEMA NFIP Community Status Book, Utah records, retrieved October 10, 2026; dataset refresh August 25, 2026. https://www.fema.gov/api/open/v1/NfipCommunityStatusBook. Map dates are FEMA effective-map entries, not evidence of local adoption or implementation.

Washington City Capability Assessment

Table 68 describes the mitigation capabilities for Washington City.

Table 178: Washington City Capability Assessment

Capability	Description
Plans and Regulations	General Plan – July 14, 1997 Washington City has planning and regulatory capability through its general plan, zoning and subdivision ordinances, building permitting, development review, and infrastructure planning. These mechanisms allow the city to guide growth, apply construction standards, and consider hazard exposure in land use and capital improvement decisions.
Administrative and Technical	Administrative and technical capability is supported by city leadership, planning and zoning, building and engineering functions, public works, emergency response coordination, and access to GIS, consultant, county, and state technical support. The city can review development proposals, manage infrastructure needs, and coordinate mitigation projects with regional partners.
Financial	Financial capability includes annual budgeting, impact fees or development-related financing where applicable, capital improvement planning, utility revenues, and the ability to pursue state and federal grant funding for drainage, transportation, public safety, and other mitigation-related projects. Local funds may not be sufficient for all needs, so outside funding remains important.
Education and Outreach	Washington City has education and outreach capability through city meetings, website and social media communications, emergency alerts, utility and conservation messaging, and coordination with community partners. Outreach can help residents understand flood, wildfire, heat, drought, and other local risks and support household preparedness.
National Flood Insurance Program	FEMA lists Washington City as an NFIP-participating community (Community 490182). The effective-map field is recorded as 04/02/09; this is not a local ordinance-adoption date. No CRS class is reported in this entry. The status book establishes program status, not local permitting, enforcement, or substantial-improvement/substantial-damage implementation. Participant-specific implementation records and repetitive-loss/severe-repetitive-loss building counts and types are not established by the available evidence; no zero count or finding of compliance is inferred.[282]

[282] FEMA, OpenFEMA NFIP Community Status Book, Utah records, retrieved October 10, 2026; dataset refresh August 25, 2026. https://www.fema.gov/api/open/v1/NfipCommunityStatusBook. Map dates are FEMA effective-map entries, not evidence of local adoption or implementation.

The hazard mitigation plan must describe the opportunities to expand and improve upon the capabilities described in the plan. For Washington City, this includes:

- **Plans and Regulations:** Continue integrating hazard data into development review, update ordinances as growth expands into risk-prone areas, and align mitigation priorities with the city's general plan and capital improvements.
- **Administrative and Technical:** Improve asset inventories, drainage and infrastructure risk assessments, and coordination between planning, public works, emergency response, and regional partners on mitigation implementation.
- **Financial:** Develop project-ready mitigation concepts for grant opportunities, identify local match strategies, and continue including resilience improvements in routine infrastructure and utility investments.
- **Education and Outreach:** Expand recurring outreach on flood safety, wildfire defensible space, water conservation, and heat preparedness, and ensure public messaging is timely and accessible.
- **National Flood Insurance Program:** Maintain ordinance compliance, improve floodplain recordkeeping and public information, and continue coordinating on map updates, drainage planning, and repetitive flood risk reduction.

Hurricane Capability Assessment

Table 179 describes the mitigation capabilities for Hurricane.

Table 179: Hurricane Capability Assessment

Capability	Description
Plans and Regulations	General Plan – March 30, 2025 Hurricane has planning and regulatory capability through its general plan, zoning and subdivision regulations, building permitting, development review, and infrastructure planning. Because the city continues to grow and includes areas influenced by river corridors, alluvial fans, steep terrain, and wildland-urban interface conditions, these tools are important for guiding safe development.
Administrative and Technical	Administrative and technical capability includes city leadership, planning and building staff, public works, utility functions, emergency response coordination, and access to county, state, engineering, and GIS support. The city can support project scoping, development review, drainage and infrastructure planning, and mitigation coordination with regional partners.
Financial	Financial capability includes local budgeting, utility and capital project financing, development-related revenues where applicable, and the ability to seek outside funding for flood control, transportation, public safety, and other mitigation projects. Major infrastructure and hazard-reduction needs may require phased implementation and grant support.

Capability	Description
Education and Outreach	Hurricane has education and outreach capability through city communications, emergency messaging, public meetings, social media, and partnerships with local agencies and community organizations. Outreach can address flash flooding, wildfire, drought, heat, and preparedness for both residents and visitors.
National Flood Insurance Program	FEMA lists Hurricane as an NFIP-participating community (Community 490172). The effective-map field is recorded as 04/02/09; this is not a local ordinance-adoption date. No CRS class is reported in this entry. The status book establishes program status, not local permitting, enforcement, or substantial-improvement/substantial-damage implementation. Participant-specific implementation records and repetitive-loss/severe-repetitive-loss building counts and types are not established by the available evidence; no zero count or finding of compliance is inferred.[283][284]

The hazard mitigation plan must describe the opportunities to expand and improve upon the capabilities described in the plan. For Hurricane, this includes:

- **Plans and Regulations:** Continue using land use and development regulations to reduce exposure in flood-prone, erosion-prone, and wildfire-prone areas, and strengthen integration with transportation and utility planning.
- **Administrative and Technical:** Improve drainage, slope, and infrastructure risk assessments, maintain updated critical asset data, and continue staff coordination and training for project development and hazard-informed decision-making.
- **Financial:** Prioritize shovel-ready mitigation projects for grant opportunities, identify local match options, and continue incorporating resilience improvements into routine capital and utility investments.
- **Education and Outreach:** Expand public communication on flash flooding, evacuation awareness, wildfire defensible space, and household preparedness, especially in growing neighborhoods and visitor-serving areas.
- **National Flood Insurance Program:** Maintain local compliance, improve floodplain documentation and public awareness, and coordinate on map interpretation, drainage planning, and flood mitigation project opportunities.

[283] CFR = Code of Federal Regulations

[284] FEMA, OpenFEMA NFIP Community Status Book, Utah records, retrieved October 10, 2026; dataset refresh August 25, 2026. https://www.fema.gov/api/open/v1/NfipCommunityStatusBook. Map dates are FEMA effective-map entries, not evidence of local adoption or implementation.

Santa Clara Capability Assessment

Table 180 describes the mitigation capabilities for Santa Clara.

Table 180: Santa Clara Capability Assessment

Capability	Description
Plans and Regulations	General Plan – November 12, 2025 Santa Clara has planning and regulatory capability through its general plan, zoning and subdivision ordinances, building permitting, development review, and coordination of infrastructure and utility planning. These tools help the city guide continued growth, manage development near flood- and wildfire-prone areas, and incorporate hazard considerations into land use and capital improvement decisions.
Administrative and Technical	Administrative and technical capability is supported by city leadership, planning and zoning functions, building and engineering review, public works, emergency response coordination, and access to county, consultant, GIS, and state technical support. Santa Clara can review development proposals, identify infrastructure needs, coordinate mitigation activities, and work with regional partners on project development and implementation.
Financial	Financial capability includes annual budgeting, capital improvement planning, utility revenues, development-related financing where applicable, and the ability to pursue state and federal grants for drainage, transportation, public safety, defensible space, and other mitigation-related projects. Like many growing communities, Santa Clara may need to combine local funding with outside grant support to implement larger resilience projects.
Education and Outreach	Santa Clara has education and outreach capability through city meetings, website and social media communications, emergency alerts, utility and conservation messaging, and coordination with community partners. Outreach can help residents understand local risks related to flash flooding, wildfire, drought, extreme heat, radon, and household preparedness.
National Flood Insurance Program	FEMA lists Santa Clara as an NFIP-participating community (Community 490178). The effective-map field is recorded as 04/02/09; this is not a local ordinance-adoption date. FEMA reports CRS Class 10, with original entry on 1995-10-01 and the current class effective 2023-04-01. Class 10 provides no CRS premium discount. The status book establishes program status, not local permitting, enforcement, or substantial-improvement/substantial-damage implementation. Participant-specific implementation records and repetitive-loss/severe-repetitive-loss building counts and types are not

Capability	Description
	established by the available evidence; no zero count or finding of compliance is inferred.[285]

The hazard mitigation plan must describe the opportunities to expand and improve upon the capabilities described in the plan. For Santa Clara, this includes:

- **Plans and Regulations:** Continue integrating hazard data into development review, update ordinances as needed to address growth in hazard-prone areas, and align mitigation priorities with the city's general plan and capital improvement programming.
- **Administrative and Technical:** Improve asset inventories, drainage and wildfire risk assessments, and coordination among planning, public works, emergency response, and regional partners on mitigation implementation.
- **Financial:** Develop project-ready mitigation concepts for grant opportunities, identify local match strategies, and continue incorporating resilience improvements into routine infrastructure, drainage, and utility investments.
- **Education and Outreach:** Expand recurring public communication on flood safety, wildfire defensible space, water conservation, extreme heat, and household preparedness, and ensure messaging is timely and accessible.
- **National Flood Insurance Program:** Maintain ordinance compliance, improve floodplain documentation and public information, and continue coordinating on map updates, drainage planning, and repetitive flood risk reduction where applicable.

Ivins Capability Assessment

Table 181 describes the mitigation capabilities for Ivins.

Table 181: Ivins Capability Assessment

Capability	Description
Plans and Regulations	General Plan – November 2024 Ivins has planning and regulatory capability through its general plan, zoning and subdivision ordinances, building permitting, development review, and infrastructure planning. These tools help the city manage continued growth, guide development near steep slopes and drainage corridors, and incorporate hazard considerations into land use decisions, utilities, transportation, and capital improvements.

[285] FEMA, OpenFEMA NFIP Community Status Book, Utah records, retrieved October 10, 2026; dataset refresh August 25, 2026. https://www.fema.gov/api/open/v1/NfipCommunityStatusBook. Map dates are FEMA effective-map entries, not evidence of local adoption or implementation.

Capability	Description
Administrative and Technical	Administrative and technical capability is supported by city leadership, planning and zoning, building and engineering review, public works, emergency response coordination, and access to county, consultant, GIS, and state technical support. Ivins can review development proposals, identify infrastructure and service needs, coordinate mitigation projects, and work with regional partners on project planning and implementation.
Financial	Financial capability includes annual budgeting, capital improvement planning, utility revenues, development-related financing where applicable, and the ability to pursue state and federal grants for drainage, transportation, public safety, defensible space, and other mitigation-related projects. As a growing community, Ivins may need to combine local resources with outside grant support to implement larger resilience and infrastructure improvements.
Education and Outreach	Ivins has education and outreach capability through city meetings, website and social media communications, emergency alerts, utility and conservation messaging, and coordination with community partners. Outreach can help residents understand local risks related to flash flooding, wildfire, drought, extreme heat, radon, and household preparedness.
National Flood Insurance Program	FEMA lists Ivins as an NFIP-participating community (Community 490173). The effective-map field is recorded as 04/02/09; this is not a local ordinance-adoption date. No CRS class is reported in this entry. The status book establishes program status, not local permitting, enforcement, or substantial-improvement/substantial-damage implementation. Participant-specific implementation records and repetitive-loss/severe-repetitive-loss building counts and types are not established by the available evidence; no zero count or finding of compliance is inferred.[286]

The hazard mitigation plan must describe the opportunities to expand and improve upon the capabilities described in the plan. For Ivins, this includes:

- **Plans and Regulations:** Continue integrating hazard data into development review, update ordinances as needed to address growth in hazard-prone areas, and align mitigation priorities with the city's general plan, transportation planning, and capital improvement programming.
- **Administrative and Technical:** Improve asset inventories, drainage and wildfire risk assessments, and coordination among planning, public works, emergency response, and regional partners on mitigation implementation.

[286] FEMA, OpenFEMA NFIP Community Status Book, Utah records, retrieved October 10, 2026; dataset refresh August 25, 2026. https://www.fema.gov/api/open/v1/NfipCommunityStatusBook. Map dates are FEMA effective-map entries, not evidence of local adoption or implementation.

- **Financial:** Develop project-ready mitigation concepts for grant opportunities, identify local match strategies, and continue incorporating resilience improvements into routine infrastructure, drainage, and utility investments.
- **Education and Outreach:** Expand recurring public communication on flood safety, wildfire defensible space, water conservation, extreme heat, and household preparedness, and ensure messaging is timely and accessible.
- **National Flood Insurance Program:** Maintain floodplain management compliance where applicable, improve documentation and public information, and continue coordinating on map updates, drainage planning, and flood risk reduction opportunities.

La Verkin Capability Assessment

Table 182 describes the mitigation capabilities for La Verkin.

Table 182: La Verkin Capability Assessment

Capability	Description
Plans and Regulations	General Plan – 2018 La Verkin has planning and regulatory capability through its general plan, zoning and subdivision regulations, building permitting, development review, and capital facilities and utility planning. These tools are important for guiding growth in a community influenced by drainage corridors, steep terrain, geologic constraints, and wildfire exposure, and they provide a framework for incorporating hazard considerations into land use, infrastructure, and development decisions.
Administrative and Technical	Administrative and technical capability is supported by city leadership, planning and zoning, building and engineering review, public works, utility operations, emergency response coordination, and access to county, consultant, GIS, and state technical support. La Verkin can review development proposals, evaluate local drainage and infrastructure needs, coordinate mitigation priorities, and work with regional partners on project planning, hazard information, and implementation.
Financial	Financial capability includes annual budgeting, capital facilities planning, utility revenues, development-related financing where applicable, and the ability to pursue state and federal grants for drainage, transportation, public safety, water system improvements, and other mitigation-related projects. As a smaller but growing community, La Verkin may need to phase higher-cost projects and combine local resources with outside grant support to implement larger resilience and infrastructure improvements.
Education and Outreach	La Verkin has education and outreach capability through city meetings, website and social media communications, emergency alerts, newsletters and public notices, utility and conservation messaging, and coordination with community partners. Outreach can help residents understand local

Capability	Description
	risks related to flash flooding, wildfire, drought, extreme heat, geologic hazards, and household preparedness.
National Flood Insurance Program	FEMA lists La Verkin as an NFIP-participating community (Community 490174). The effective-map field is recorded as 04/02/09; this is not a local ordinance-adoption date. No CRS class is reported in this entry. The status book establishes program status, not local permitting, enforcement, or substantial-improvement/substantial-damage implementation. Participant-specific implementation records and repetitive-loss/severe-repetitive-loss building counts and types are not established by the available evidence; no zero count or finding of compliance is inferred.[287]

The hazard mitigation plan must describe the opportunities to expand and improve upon the capabilities described in the plan. For La Verkin, this includes:

- **Plans and Regulations:** Continue integrating hazard data into development review, update ordinances and design standards as needed for drainage corridors, steep slopes, geologic hazard areas, and wildfire-prone locations, and align mitigation priorities with the city's general plan, capital facilities planning, utility planning, and transportation decisions.
- **Administrative and Technical:** Expand GIS-based risk analysis, maintain updated inventories of critical facilities, drainage assets, transportation links, and other vulnerable infrastructure, improve coordination among planning, public works, utilities, emergency response, and regional partners, and continue staff training on mitigation project development and hazard-informed planning.
- **Financial:** Develop project-ready mitigation concepts for grant opportunities, identify local match strategies, continue incorporating resilience improvements into drainage, transportation, water system, and public safety investments, and prioritize projects that can combine city resources with state and federal funding.
- **Education and Outreach:** Expand recurring public communication on flash flooding, wildfire defensible space, drought and water conservation, extreme heat, geologic hazards, and household preparedness; improve outreach to new residents and businesses; and ensure public messaging remains timely, accessible, and coordinated across city departments and partner agencies.
- **National Flood Insurance Program:** Maintain local floodplain management compliance, improve floodplain documentation and public information, continue coordinating on map updates, drainage planning, and erosion hazard management, and identify opportunities to reduce repetitive flood risk and improve resilience in mapped flood hazard areas and along drainage corridors.

[287] FEMA, OpenFEMA NFIP Community Status Book, Utah records, retrieved October 10, 2026; dataset refresh August 25, 2026. https://www.fema.gov/api/open/v1/NfipCommunityStatusBook. Map dates are FEMA effective-map entries, not evidence of local adoption or implementation.

Enterprise Capability Assessment

Table 183 describes the mitigation capabilities for Enterprise.

Table 183: Enterprise Capability Assessment

Capability	Description
Plans and Regulations	General Plan – November 16, 2023; contains current local plan and ordinances guide land use, subdivision, and development review Enterprise has planning and regulatory capability through its general plan, zoning and subdivision ordinances, building and zoning review, and city ordinances that guide growth, land use, and infrastructure decisions. These tools are important in a rural community with agricultural land, open space, wildfire exposure, drainage concerns, and weather-related risks, and they provide a framework for incorporating hazard considerations into future development and community investment decisions.
Administrative and Technical	Administrative and technical capability is supported by city leadership, planning commission and zoning functions, building and public works coordination, utility operations, emergency response and fire protection coordination, and access to county, consultant, GIS, and state technical resources. Enterprise can review development proposals, identify local infrastructure and service needs, coordinate mitigation priorities, and work with regional and state partners on project planning, wildfire preparedness, and hazard-informed decision-making.
Financial	Financial capability includes annual budgeting, utility and service revenues, capital improvement needs planning, and the ability to pursue state and federal grants and other outside funding for wildfire mitigation, drainage, transportation, public safety, water system improvements, and resilience projects. As a smaller rural community, Enterprise may need to phase larger projects over time and combine local resources with outside assistance to implement higher-cost mitigation and infrastructure improvements.
Education and Outreach	Enterprise has education and outreach capability through city meetings, website and public notices, emergency alerts, wildfire preparedness messaging, utility and conservation communication, and coordination with local fire, county, and community partners. Outreach can help residents understand local risks related to wildfire, drought, winter weather, wind, flooding, and household preparedness in a rural setting.

Capability	Description
National Flood Insurance Program	FEMA lists Enterprise as an NFIP-participating community (Community 490169). The effective-map field is recorded as 04/02/09; this is not a local ordinance-adoption date. No CRS class is reported in this entry. The status book establishes program status, not local permitting, enforcement, or substantial-improvement/substantial-damage implementation. Participant-specific implementation records and repetitive-loss/severe-repetitive-loss building counts and types are not established by the available evidence; no zero count or finding of compliance is inferred.[288]

The hazard mitigation plan must describe the opportunities to expand and improve upon the capabilities described in the plan. For Enterprise, this includes:

- **Plans and Regulations:** Continue integrating hazard data into development review, update ordinances and design standards as needed for wildfire-prone areas, drainage concerns, agricultural-residential interfaces, and other hazard-sensitive locations, and align mitigation priorities with the city's general plan, capital improvement needs, utility planning, and future growth decisions.
- **Administrative and Technical:** Expand GIS-based risk analysis, maintain updated inventories of critical facilities, water and utility assets, road access, and other vulnerable infrastructure, improve coordination among planning, public works, fire protection, emergency response, and regional partners, and continue staff training on mitigation project development and hazard-informed planning.
- **Financial:** Develop project-ready mitigation concepts for grant opportunities, identify local match strategies, continue incorporating resilience improvements into wildfire mitigation, drainage, transportation, water system, and public safety investments, and prioritize projects that can combine local resources with state and federal funding.
- **Education and Outreach:** Expand recurring public communication on wildfire defensible space, drought and water conservation, winter weather, wind, flooding, and household preparedness; improve outreach to rural residents, agricultural landowners, and businesses; and ensure public messaging remains timely, accessible, and coordinated across city departments and partner agencies.
- **National Flood Insurance Program:** Maintain local floodplain management compliance where applicable, improve floodplain documentation and public information, continue coordinating on map updates, drainage planning, and erosion hazard awareness, and identify opportunities to reduce flood risk and improve resilience in mapped flood hazard areas and along drainageways.

[288] FEMA, OpenFEMA NFIP Community Status Book, Utah records, retrieved October 10, 2026; dataset refresh August 25, 2026. https://www.fema.gov/api/open/v1/NfipCommunityStatusBook. Map dates are FEMA effective-map entries, not evidence of local adoption or implementation.

Toquerville Capability Assessment

Table 184 describes the mitigation capabilities for Toquerville.

Table 184: Toquerville Capability Assessment

Capability	Description
Plans and Regulations	General Plan - 2023 Toquerville has planning and regulatory capability through its general plan, zoning and subdivision regulations, development review procedures, building-related regulations, and adopted city ordinances that guide growth, infrastructure, and land use decisions. These tools are especially important in a community shaped by drainage corridors, steep terrain, flood and erosion concerns, wildfire exposure, and continued residential growth, and they provide a framework for incorporating hazard considerations into development, utilities, transportation, and capital improvement planning.
Administrative and Technical	Administrative and technical capability is supported by city leadership, planning and zoning administration, development review, public works and utility functions, emergency response coordination, and access to county, consultant, GIS, engineering, and state technical resources. Toquerville can review development proposals, evaluate drainage and infrastructure constraints, coordinate mitigation priorities, and work with regional partners on project planning, hazard information, and implementation.
Financial	Financial capability includes annual budgeting, capital facilities and infrastructure planning, utility revenues, development-related financing where applicable, and the ability to pursue state and federal grants and other outside funding for drainage, transportation, wildfire mitigation, public safety, water system improvements, and resilience projects. As a smaller but growing community, Toquerville may need to phase larger projects over time and combine local resources with outside grant support to implement higher-cost mitigation and infrastructure improvements.
Education and Outreach	Toquerville has education and outreach capability through city meetings, website and public information, emergency alerts, social media, utility and conservation messaging, and coordination with local and regional partners. Outreach can help residents understand local risks related to flash flooding, erosion, wildfire, drought, extreme heat, and household preparedness in a rapidly changing rural-residential setting.
National Flood Insurance Program	FEMA lists Toquerville as an NFIP-participating community (Community 490180). The effective-map field is recorded as 04/02/09; this is not a local ordinance-adoption date. No CRS class is reported in this entry. The status book establishes program status, not local permitting, enforcement, or substantial-improvement/substantial-damage implementation. Participant-specific implementation records and repetitive-loss/severe-repetitive-loss

Capability	Description
	building counts and types are not established by the available evidence; no zero count or finding of compliance is inferred.[289]

The hazard mitigation plan must describe the opportunities to expand and improve upon the capabilities described in the plan. For Toquerville, this includes:

- **Plans and Regulations:** Continue integrating hazard data into development review, update ordinances and design standards as needed for drainage corridors, erosion-prone areas, steep slopes, wildfire-prone locations, and other hazard-sensitive areas, and align mitigation priorities with the city's general plan, utility planning, transportation planning, and capital improvement decisions.
- **Administrative and Technical:** Expand GIS-based risk analysis, maintain updated inventories of critical facilities, drainage assets, roads, utilities, and other vulnerable infrastructure, improve coordination among planning, public works, utilities, emergency response, and regional partners, and continue staff training on mitigation project development and hazard-informed planning.
- **Financial:** Develop project-ready mitigation concepts for grant opportunities, identify local match strategies, continue incorporating resilience improvements into drainage, transportation, wildfire mitigation, water system, and public safety investments, and prioritize projects that can combine local resources with state and federal funding.
- **Education and Outreach:** Expand recurring public communication on flash flooding, erosion, wildfire defensible space, drought and water conservation, extreme heat, and household preparedness; improve outreach to new residents and property owners; and ensure public messaging remains timely, accessible, and coordinated across city departments and partner agencies.
- **National Flood Insurance Program:** Maintain local floodplain management compliance, improve floodplain documentation and public information, continue coordinating on map updates, drainage planning, and erosion hazard management, and identify opportunities to reduce repetitive flood risk and improve resilience in mapped flood hazard areas and along drainage corridors.

Leeds Capability Assessment

Table 185 describes the mitigation capabilities for Leeds.

Table 185: Leeds Capability Assessment

Capability	Description
Plans and Regulations	General Plan – November 30, 2022

[289] FEMA, OpenFEMA NFIP Community Status Book, Utah records, retrieved October 10, 2026; dataset refresh August 25, 2026. https://www.fema.gov/api/open/v1/NfipCommunityStatusBook. Map dates are FEMA effective-map entries, not evidence of local adoption or implementation.

Capability	Description
	Leeds has planning and regulatory capability through its adopted General Plan, land use and zoning ordinances, subdivision and development review procedures, building-related requirements, and town standards for design and infrastructure. These tools are important in a small community shaped by Interstate 15, drainage corridors, steep slopes and geologic constraints, wildfire exposure, and continued development pressure, and they provide a framework for incorporating hazard considerations into land use, transportation, utility, and capital improvement decisions.
Administrative and Technical	Administrative and technical capability is supported by town leadership, planning commission and land use administration, building and development review, public works and utility coordination, emergency response coordination, and access to county, consultant, engineering, GIS, and state technical resources. Leeds can review development proposals, identify local drainage and infrastructure needs, evaluate hazard-sensitive sites, and coordinate mitigation priorities with regional partners and service providers.
Financial	Financial capability includes annual budgeting, utility and service revenues, development-related financing where applicable, capital improvement planning, and the ability to pursue state and federal grants and other outside funding for drainage, transportation, wildfire mitigation, public safety, water system improvements, and resilience projects. As a smaller community, Leeds may need to phase larger projects over time and combine local resources with outside assistance to implement higher-cost mitigation and infrastructure improvements.
Education and Outreach	Leeds has education and outreach capability through town meetings, website and public notices, emergency alerts, social media and community communication, utility and conservation messaging, and coordination with county, fire, and community partners. Outreach can help residents understand local risks related to flash flooding, wildfire, drought, wind, geologic hazards, and household preparedness in a small rural-residential setting.
National Flood Insurance Program	FEMA lists Leeds as an NFIP-participating community (Community 490175). The effective-map field is recorded as 04/02/09; this is not a local ordinance-adoption date. No CRS class is reported in this entry. The status book establishes program status, not local permitting, enforcement, or substantial-improvement/substantial-damage implementation. Participant-specific implementation records and repetitive-loss/severe-repetitive-loss building counts and types are not established by the available evidence; no zero count or finding of compliance is inferred.[290]

[290] FEMA, OpenFEMA NFIP Community Status Book, Utah records, retrieved October 10, 2026; dataset refresh August 25, 2026. https://www.fema.gov/api/open/v1/NfipCommunityStatusBook. Map dates are FEMA effective-map entries, not evidence of local adoption or implementation.

The hazard mitigation plan must describe the opportunities to expand and improve upon the capabilities described in the plan. For Leeds, this includes:

- **Plans and Regulations:** Continue integrating hazard data into development review, update ordinances and design standards as needed for drainage corridors, steep slopes, geologic hazard areas, wildfire-prone locations, and development near key transportation corridors, and align mitigation priorities with the town's general plan, utility planning, transportation planning, and capital improvement decisions.
- **Administrative and Technical:** Expand GIS-based risk analysis, maintain updated inventories of critical facilities, drainage assets, road access, utility systems, and other vulnerable infrastructure, improve coordination among planning, public works, emergency response, and regional partners, and continue staff training on mitigation project development and hazard-informed planning.
- **Financial:** Develop project-ready mitigation concepts for grant opportunities, identify local match strategies, continue incorporating resilience improvements into drainage, transportation, wildfire mitigation, water system, and public safety investments, and prioritize projects that can combine local resources with state and federal funding.
- **Education and Outreach:** Expand recurring public communication on flash flooding, wildfire defensible space, drought and water conservation, wind, geologic hazards, and household preparedness; improve outreach to new residents and property owners; and ensure public messaging remains timely, accessible, and coordinated across town departments and partner agencies.
- **National Flood Insurance Program:** Maintain local floodplain management compliance where applicable, improve floodplain documentation and public information, continue coordinating on map updates, drainage planning, and erosion hazard awareness, and identify opportunities to reduce flood risk and improve resilience in mapped flood hazard areas and along local drainageways.

Virgin Capability Assessment

Table 186 describes the mitigation capabilities for Virgin.

Table 186: Virgin Capability Assessment

Capability	Description
Plans and Regulations	General Plan update in progress as of June 2025 Virgin has planning and regulatory capability through its general plan update, zoning and subdivision regulations, development review procedures, building-related requirements, and town ordinances that guide growth, tourism-related development, land use, and infrastructure decisions. These tools are especially important in a gateway community influenced by the Zion corridor, SR-9 access, drainage and flash flood hazards, steep terrain, wildfire exposure, and visitor-serving land uses, and they provide a framework for incorporating hazard considerations into

Capability	Description
	future development, utilities, transportation, and capital improvement planning.
Administrative and Technical	Administrative and technical capability is supported by town leadership, planning and zoning administration, development review, utility and public works coordination, emergency response coordination, and access to county, consultant, GIS, engineering, and state technical resources. Virgin can review development proposals, evaluate drainage and infrastructure constraints, coordinate mitigation priorities, and work with regional partners on project planning, hazard information, visitor access and evacuation considerations, and implementation.
Financial	Financial capability includes annual budgeting, utility and service revenues, development-related financing where applicable, capital improvement planning, and the ability to pursue state and federal grants and other outside funding for drainage, transportation, wildfire mitigation, public safety, water system improvements, and resilience projects. As a small gateway community with infrastructure demands tied to residents and visitors, Virgin may need to phase larger projects over time and combine local resources with outside assistance to implement higher-cost mitigation and infrastructure improvements.
Education and Outreach	Virgin has education and outreach capability through town meetings, website and public information, emergency alerts, social media, visitor-oriented communication, utility and conservation messaging, and coordination with county, tourism, and community partners. Outreach can help residents, businesses, and visitors understand local risks related to flash flooding, wildfire, drought, extreme heat, evacuation constraints, and household and visitor preparedness in a high-traffic gateway setting.
National Flood Insurance Program	FEMA lists Virgin as an NFIP-participating community (Community 490181). The effective-map field is recorded as 04/02/09(M); this is not a local ordinance-adoption date. No CRS class is reported in this entry. The status book establishes program status, not local permitting, enforcement, or substantial-improvement/substantial-damage implementation. Participant-specific implementation records and repetitive-loss/severe-repetitive-loss building counts and types are not established by the available evidence; no zero count or finding of compliance is inferred.[291]

The hazard mitigation plan must describe the opportunities to expand and improve upon the capabilities described in the plan. For Virgin, this includes:

- **Plans and Regulations:** Continue integrating hazard data into development review, update ordinances and design standards as needed for flash flood-prone drainage corridors, steep terrain,

[291] FEMA, OpenFEMA NFIP Community Status Book, Utah records, retrieved October 10, 2026; dataset refresh August 25, 2026. https://www.fema.gov/api/open/v1/NfipCommunityStatusBook. Map dates are FEMA effective-map entries, not evidence of local adoption or implementation.

wildfire-prone areas, and visitor-serving development, and align mitigation priorities with the town's general plan update, utility planning, transportation planning, and capital improvement decisions.

- **Administrative and Technical:** Expand GIS-based risk analysis, maintain updated inventories of critical facilities, drainage assets, roadway access, utility systems, and other vulnerable infrastructure, improve coordination among planning, public works, emergency response, and regional partners, and continue staff training on mitigation project development, visitor access and evacuation planning, and hazard-informed decision-making.
- **Financial:** Develop project-ready mitigation concepts for grant opportunities, identify local match strategies, continue incorporating resilience improvements into drainage, transportation, wildfire mitigation, water system, and public safety investments, and prioritize projects that can combine local resources with state and federal funding.
- **Education and Outreach:** Expand recurring public communication on flash flooding, wildfire defensible space, drought and water conservation, extreme heat, evacuation awareness, and household and visitor preparedness; improve outreach to residents, businesses, and visitors; and ensure public messaging remains timely, accessible, and coordinated across town departments and partner agencies.
- **National Flood Insurance Program:** Maintain local floodplain management compliance, improve floodplain documentation and public information, continue coordinating on map updates, drainage planning, and flood risk reduction along flash flood-prone corridors, and identify opportunities to reduce repetitive flood risk and improve resilience in mapped flood hazard areas.

Springdale Capability Assessment

Table 187 describes the mitigation capabilities for Springdale.

Table 187: Springdale Capability Assessment

Capability	Description
Plans and Regulations	General Plan – July 13, 2022 Springdale has strong planning and regulatory capability through its General Plan, land use and zoning ordinances, subdivision and development review procedures, design standards, building-related requirements, and supporting plans that guide future growth, transportation, utilities, and community character. These tools are especially important in a gateway community adjacent to Zion National Park, where visitor traffic, the Virgin River corridor, steep terrain, flood hazards, wildfire exposure, and constrained transportation access all influence land use and infrastructure decisions.
Administrative and Technical	Administrative and technical capability is supported by town leadership, community development and planning staff, development review, public works and utility coordination, emergency response coordination, and

Capability	Description
	access to county, consultant, GIS, engineering, and state and federal technical resources. Springdale can evaluate development proposals, manage floodplain and site constraints, coordinate transportation and visitor access issues, maintain hazard information, and work with regional partners on mitigation planning and implementation.
Financial	Financial capability includes annual budgeting, utility and service revenues, capital improvement planning, tourism-supported local revenues where applicable, and the ability to pursue state and federal grants and other outside funding for drainage, transportation, wildfire mitigation, public safety, water system improvements, and resilience projects. As a small gateway community with significant infrastructure demands tied to residents and visitors, Springdale may need to phase larger projects and combine local funds with external assistance to implement higher-cost mitigation improvements.
Education and Outreach	Springdale has education and outreach capability through town meetings, website and public information, emergency alerts, community and visitor communications, utility and conservation messaging, and coordination with Zion National Park, tourism partners, county agencies, and community organizations. Outreach can help residents, employees, businesses, and visitors understand local risks related to flash flooding, wildfire, drought, extreme heat, transportation disruptions, and household and visitor preparedness.
National Flood Insurance Program	FEMA lists Springdale as an NFIP-participating community (Community 490179). The effective-map field is recorded as 04/02/09; this is not a local ordinance-adoption date. No CRS class is reported in this entry. The status book establishes program status, not local permitting, enforcement, or substantial-improvement/substantial-damage implementation. Participant-specific implementation records and repetitive-loss/severe-repetitive-loss building counts and types are not established by the available evidence; no zero count or finding of compliance is inferred.[292]

The hazard mitigation plan must describe the opportunities to expand and improve upon the capabilities described in the plan. For Springdale, this includes:

- **Plans and Regulations:** Continue integrating hazard data into development review, update ordinances and design standards as needed for development along the Virgin River corridor, steep terrain, wildfire-prone areas, and visitor-serving land uses, and align mitigation priorities with the town's general plan, transportation planning, utility planning, and capital improvement decisions.
- **Administrative and Technical:** Expand GIS-based risk analysis, maintain updated inventories of critical facilities, river corridor assets, transportation access points, utilities, and other vulnerable

[292] FEMA, OpenFEMA NFIP Community Status Book, Utah records, retrieved October 10, 2026; dataset refresh August 25, 2026. https://www.fema.gov/api/open/v1/NfipCommunityStatusBook. Map dates are FEMA effective-map entries, not evidence of local adoption or implementation.

infrastructure, improve coordination among planning, public works, emergency response, Zion-area partners, and regional agencies, and continue staff training on mitigation project development, visitor access and evacuation planning, and hazard-informed decision-making.

- **Financial:** Develop project-ready mitigation concepts for grant opportunities, identify local match strategies, continue incorporating resilience improvements into drainage, transportation, wildfire mitigation, water system, and public safety investments, and prioritize projects that can combine local resources with state and federal funding.
- **Education and Outreach:** Expand recurring public communication on flash flooding, wildfire defensible space, drought and water conservation, extreme heat, evacuation awareness, transportation disruptions, and household and visitor preparedness; improve outreach to residents, employees, businesses, and visitors; and ensure public messaging remains timely, accessible, and coordinated across town departments and partner agencies.
- **National Flood Insurance Program:** Maintain local floodplain management compliance, improve floodplain documentation and public information, continue coordinating on map updates, drainage planning, and flood risk reduction along the Virgin River corridor and other flood-prone areas, and identify opportunities to reduce repetitive flood risk and improve resilience in mapped flood hazard areas.

New Harmony Capability Assessment

Table 188 describes the mitigation capabilities for New Harmony.

Table 188: New Harmony Capability Assessment

Capability	Description
Plans and Regulations	New Harmony Valley General Plan – part of Washington County General Plan; local zoning and planning commission and town ordinances in place New Harmony has planning and regulatory capability through the New Harmony Valley general planning framework, local zoning and planning commission functions, town ordinances, development review, and coordination with Washington County regulations and regional planning tools. These capabilities are important in a rural mountain-valley community with agricultural and residential land uses, cold-season weather, wildfire exposure, drainage and flood concerns, and limited transportation access, and they provide a framework for incorporating hazard considerations into future land use, infrastructure, and community development decisions.
Administrative and Technical	Administrative and technical capability is supported by town leadership, planning commission functions, road and street maintenance, local water system operations, parks and cemetery management, coordination with the Washington County Sheriff's Office and Harmony Valley Fire Department, and access to county, consultant, GIS, engineering, and state technical resources. New Harmony can review local development and infrastructure

Capability	Description
	needs, coordinate mitigation priorities, maintain awareness of hazard conditions, and work with regional partners on project planning and implementation.
Financial	Financial capability includes annual budgeting, local utility and service revenues, maintenance of town roads and water infrastructure, and the ability to pursue state and federal grants and other outside funding for wildfire mitigation, drainage and road improvements, water system resilience, public safety, and other mitigation-related projects. As a small rural community, New Harmony may need to phase larger projects over time and combine local resources with grant support and partner agency assistance to implement higher-cost improvements.
Education and Outreach	New Harmony has education and outreach capability through town council and planning commission meetings, public notices, community communication, emergency alerts, and coordination with local fire protection, county agencies, and community partners. Outreach can help residents understand local risks related to wildfire, drought, winter storms, flooding, wind, and household preparedness in a rural mountain-valley setting.
National Flood Insurance Program	FEMA lists New Harmony as an NFIP-participating community (Community 490004). The effective-map field is recorded as 04/02/09; this is not a local ordinance-adoption date. No CRS class is reported in this entry. The status book establishes program status, not local permitting, enforcement, or substantial-improvement/substantial-damage implementation. Participant-specific implementation records and repetitive-loss/severe-repetitive-loss building counts and types are not established by the available evidence; no zero count or finding of compliance is inferred.[293]

The hazard mitigation plan must describe the opportunities to expand and improve upon the capabilities described in the plan. For New Harmony, this includes:

- **Plans and Regulations:** Continue integrating hazard data into local development review and community planning, update ordinances and design standards as needed for wildfire-prone areas, drainage corridors, winter weather exposure, and other hazard-sensitive locations, and align mitigation priorities with the New Harmony Valley planning framework, local infrastructure planning, and coordination with Washington County.
- **Administrative and Technical:** Expand GIS-based risk analysis and local hazard awareness, maintain updated inventories of critical facilities, roads, water system assets, and other vulnerable infrastructure, improve coordination among town leadership, fire protection, county agencies, and

[293] FEMA, OpenFEMA NFIP Community Status Book, Utah records, retrieved October 10, 2026; dataset refresh August 25, 2026. https://www.fema.gov/api/open/v1/NfipCommunityStatusBook. Map dates are FEMA effective-map entries, not evidence of local adoption or implementation.

service providers, and continue training on mitigation project development and hazard-informed planning.

- **Financial:** Develop project-ready mitigation concepts for grant opportunities, identify local match strategies, continue incorporating resilience improvements into road maintenance, water system investments, wildfire mitigation, and public safety needs, and prioritize projects that can combine local resources with state, federal, and partner agency funding.
- **Education and Outreach:** Expand recurring public communication on wildfire defensible space, drought and water conservation, winter weather preparedness, flooding, wind, and household preparedness; improve outreach to residents in more isolated areas; and ensure public messaging remains timely, accessible, and coordinated with local fire protection and county partners.
- **National Flood Insurance Program:** Improve local floodplain and drainage documentation, continue coordinating with Washington County and the State of Utah on flood hazard mapping, technical guidance, and development review where applicable, and identify opportunities to reduce flood risk and strengthen floodplain management capacity despite limited local staffing and resources.

Rockville Capability Assessment

Table 189 describes the mitigation capabilities for Rockville.

Table 189: Rockville Capability Assessment

Capability	Description
Plans and Regulations	General Plan – adopted August 14, 1997, and updated November 2020 Rockville has planning and regulatory capability through its General Plan, land use code, zoning and subdivision regulations, flood damage prevention ordinance, grading and excavation standards, and local review processes that guide growth and preserve community character. These tools are especially important in a small historic, agricultural, and residential community along the Virgin River corridor where floodplain conditions, sensitive lands, steep terrain, wildfire exposure, and gateway traffic associated with Zion National Park all influence land use and infrastructure decisions.
Administrative and Technical	Administrative and technical capability is supported by town leadership, planning commission and land use administration, building and development review, coordination with public works and utility functions, emergency response coordination, and access to county, consultant, GIS, engineering, and state technical resources. Rockville can review development proposals, evaluate floodplain and sensitive land constraints, coordinate mitigation priorities, and work with regional partners on project planning, historic resource protection, evacuation access, and implementation.

Capability	Description
Financial	Financial capability includes annual budgeting, modest local service and infrastructure funding, development-related financing where applicable, and the ability to pursue state and federal grants and other outside assistance for flood mitigation, transportation, historic preservation, public safety, water system improvements, and resilience projects. As a very small community with limited fiscal capacity, Rockville may need to phase larger projects over time and rely on partnerships and grant support to implement higher-cost mitigation improvements.
Education and Outreach	Rockville has education and outreach capability through town meetings, website and public notices, emergency alerts, community communication, and coordination with county agencies, nearby jurisdictions, and community organizations. Outreach can help residents, property owners, and visitors understand local risks related to flooding along the Virgin River, flash flooding, wildfire, evacuation constraints, drought, and household and visitor preparedness while also supporting awareness of the town's historic and environmental sensitivities.
National Flood Insurance Program	FEMA lists Rockville as an NFIP-participating community (Community 490176). The effective-map field is recorded as 04/02/09; this is not a local ordinance-adoption date. No CRS class is reported in this entry. The status book establishes program status, not local permitting, enforcement, or substantial-improvement/substantial-damage implementation. Participant-specific implementation records and repetitive-loss/severe-repetitive-loss building counts and types are not established by the available evidence; no zero count or finding of compliance is inferred.[294]

The hazard mitigation plan must describe the opportunities to expand and improve upon the capabilities described in the plan. For Rockville, this includes:

- **Plans and Regulations:** Continue integrating hazard data into development review, update ordinances and design standards as needed for development along the Virgin River corridor, floodplain areas, steep terrain, wildfire-prone areas, and historic or sensitive land uses, and align mitigation priorities with the town's general plan, transportation access planning, utility needs, and preservation goals.
- **Administrative and Technical:** Expand GIS-based risk analysis, maintain updated inventories of critical facilities, river corridor assets, transportation and evacuation access points, historic resources, utilities, and other vulnerable infrastructure, improve coordination among planning, emergency response, county partners, and nearby jurisdictions, and continue staff training on mitigation project development and hazard-informed decision-making.

[294] FEMA, OpenFEMA NFIP Community Status Book, Utah records, retrieved October 10, 2026; dataset refresh August 25, 2026. https://www.fema.gov/api/open/v1/NfipCommunityStatusBook. Map dates are FEMA effective-map entries, not evidence of local adoption or implementation.

- **Financial:** Develop project-ready mitigation concepts for grant opportunities, identify local match strategies, continue incorporating resilience improvements into flood mitigation, transportation access, water system, public safety, and historic resource protection investments, and prioritize projects that can combine local resources with state and federal funding.
- **Education and Outreach:** Expand recurring public communication on flooding along the Virgin River, flash flooding, wildfire defensible space, drought and water conservation, evacuation awareness, and household and visitor preparedness; improve outreach to residents, property owners, and visitors; and ensure public messaging remains timely, accessible, and coordinated with county and regional partners.
- **National Flood Insurance Program:** Maintain local floodplain management compliance, improve floodplain documentation and public information, continue coordinating on map updates, ordinance administration, and flood risk reduction along the Virgin River corridor, and identify opportunities to reduce repetitive flood risk and improve resilience in mapped flood hazard areas.

Apple Valley Capability Assessment

Table 190 describes the mitigation capabilities for Apple Valley.

Table 190: Apple Valley Capability Assessment

Capability	Description
Plans and Regulations	General Plan – 2022 Apple Valley has planning and regulatory capability through its adopted General Plan, land use and subdivision regulations, development review procedures, building permit requirements, and town ordinances that guide growth, infrastructure, and community character. These tools are important in a rural-residential community with dispersed development, drainage and flood concerns, wildfire exposure, transportation access constraints, and ongoing growth pressures, and they provide a framework for incorporating hazard considerations into land use, utilities, and capital improvement decisions.
Administrative and Technical	Administrative and technical capability is supported by town leadership, planning commission and land use administration, building and code enforcement functions, utility and water system coordination, fire department and emergency response coordination, and access to county, consultant, GIS, engineering, and state technical resources. Apple Valley can review development proposals, evaluate infrastructure and service needs, identify hazard-sensitive sites, and coordinate mitigation priorities with regional partners and service providers.
Financial	Financial capability includes annual budgeting, utility and water system revenues, development-related financing where applicable, capital facilities planning, and the ability to pursue state and federal grants and other outside funding for drainage, transportation, wildfire mitigation, public

Capability	Description
	safety, water system improvements, and resilience projects. As a small but growing community with dispersed infrastructure needs, Apple Valley may need to phase larger projects over time and combine local resources with outside assistance to implement higher-cost mitigation improvements.
Education and Outreach	Apple Valley has education and outreach capability through town meetings, website and public information, text alerts and emergency messaging, utility and conservation communication, and coordination with community partners and service providers. Outreach can help residents understand local risks related to flash flooding, wildfire, drought, extreme heat, transportation disruptions, and household preparedness in a rural-residential setting.
National Flood Insurance Program	FEMA lists Apple Valley as an NFIP-participating community (Community 490026). The effective-map field is recorded as 04/02/09; this is not a local ordinance-adoption date. No CRS class is reported in this entry. The status book establishes program status, not local permitting, enforcement, or substantial-improvement/substantial-damage implementation. Participant-specific implementation records and repetitive-loss/severe-repetitive-loss building counts and types are not established by the available evidence; no zero count or finding of compliance is inferred.[295]

The hazard mitigation plan must describe the opportunities to expand and improve upon the capabilities described in the plan. For Apple Valley, this includes:

- **Plans and Regulations:** Continue integrating hazard data into development review, update ordinances and design standards as needed for drainage corridors, flood-prone areas, wildfire-prone locations, and dispersed rural-residential development, and align mitigation priorities with the town's general plan, utility planning, transportation access planning, and capital improvement decisions.
- **Administrative and Technical:** Expand GIS-based risk analysis, maintain updated inventories of critical facilities, water and utility assets, roads, and other vulnerable infrastructure, improve coordination among planning, code enforcement, utilities, fire protection, emergency response, and regional partners, and continue staff training on mitigation project development and hazard-informed planning.
- **Financial:** Develop project-ready mitigation concepts for grant opportunities, identify local match strategies, continue incorporating resilience improvements into drainage, transportation access, wildfire mitigation, water system, and public safety investments, and prioritize projects that can combine local resources with state and federal funding.
- **Education and Outreach:** Expand recurring public communication on flash flooding, wildfire defensible space, drought and water conservation, extreme heat, transportation disruptions, and

[295] FEMA, OpenFEMA NFIP Community Status Book, Utah records, retrieved October 10, 2026; dataset refresh August 25, 2026. https://www.fema.gov/api/open/v1/NfipCommunityStatusBook. Map dates are FEMA effective-map entries, not evidence of local adoption or implementation.

household preparedness; improve outreach to residents in more dispersed neighborhoods; and ensure public messaging remains timely, accessible, and coordinated with community partners and service providers.

- **National Flood Insurance Program:** Improve local floodplain and drainage documentation, continue coordinating with Washington County, FEMA, and the State of Utah on flood hazard mapping, technical guidance, and development review where applicable, and identify opportunities to reduce flood risk and strengthen floodplain management capacity despite limited local staffing and resources.

Hildale Capability Assessment

Table 191 describes the mitigation capabilities for Hildale.

Table 191: Hildale Capability Assessment

Capability	Description
Plans and Regulations	General Plan – 2021 Hildale has planning and regulatory capability through its adopted General Plan, planning and zoning functions, land use and development regulations, building-related requirements, and city ordinances that guide growth, infrastructure, and community development. These tools are important in a community shaped by rugged terrain, drainage and flood concerns, wildfire exposure, utility and water system needs, and ongoing change in land use and governance, and they provide a framework for incorporating hazard considerations into development, public infrastructure, and long-range planning decisions.
Administrative and Technical	Administrative and technical capability is supported by city leadership, planning and zoning administration, building and development review, public works and utility coordination, police and fire services, and access to county, consultant, GIS, engineering, and state technical resources. Hildale can review development proposals, identify infrastructure and service needs, coordinate mitigation priorities, and work with regional partners and utility providers on project planning, hazard information, and implementation.
Financial	Financial capability includes annual budgeting, utility and service revenues, water system and infrastructure planning, development-related financing where applicable, and the ability to pursue state and federal grants and other outside funding for drainage, transportation, public safety, utility improvements, and resilience projects. As a small community with significant infrastructure needs, Hildale may need to phase larger projects over time and combine local resources with outside assistance and partner support to implement higher-cost mitigation improvements.

Capability	Description
Education and Outreach	Hildale has education and outreach capability through city meetings, website and public notices, text alerts, public safety communication, utility messaging, and coordination with community partners and service providers. Outreach can help residents understand local risks related to flash flooding, wildfire, drought, extreme heat, infrastructure disruptions, and household preparedness in a rural-desert setting with growing community needs.
National Flood Insurance Program	FEMA lists Hildale as an NFIP-participating community (Community 490171). The effective-map field is recorded as 04/02/09; this is not a local ordinance-adoption date. No CRS class is reported in this entry. The status book establishes program status, not local permitting, enforcement, or substantial-improvement/substantial-damage implementation. Participant-specific implementation records and repetitive-loss/severe-repetitive-loss building counts and types are not established by the available evidence; no zero count or finding of compliance is inferred.[296]

The hazard mitigation plan must describe the opportunities to expand and improve upon the capabilities described in the plan. For Hildale, this includes:

- **Plans and Regulations:** Continue integrating hazard data into development review, update ordinances and design standards as needed for drainage corridors, flood-prone areas, wildfire-prone locations, rugged terrain, and infrastructure expansion areas, and align mitigation priorities with the city's general plan, utility planning, and capital improvement decisions.
- **Administrative and Technical:** Expand GIS-based risk analysis, maintain updated inventories of critical facilities, utility and water system assets, roads, drainage infrastructure, and other vulnerable infrastructure, improve coordination among planning, public works, utilities, police, fire, and regional partners, and continue staff training on mitigation project development and hazard-informed planning.
- **Financial:** Develop project-ready mitigation concepts for grant opportunities, identify local match strategies, continue incorporating resilience improvements into drainage, transportation, public safety, utility, and water system investments, and prioritize projects that can combine local resources with state, federal, and partner funding.
- **Education and Outreach:** Expand recurring public communication on flash flooding, wildfire defensible space, drought and water conservation, extreme heat, infrastructure disruptions, and household preparedness; improve outreach to residents across the community; and ensure public messaging remains timely, accessible, and coordinated with public safety and utility partners.
- **National Flood Insurance Program:** Maintain local floodplain management compliance, improve floodplain documentation and public information, continue coordinating on map updates, ordinance

[296] FEMA, OpenFEMA NFIP Community Status Book, Utah records, retrieved October 10, 2026; dataset refresh August 25, 2026. https://www.fema.gov/api/open/v1/NfipCommunityStatusBook. Map dates are FEMA effective-map entries, not evidence of local adoption or implementation.

administration, and flood risk reduction in drainage-sensitive areas, and identify opportunities to strengthen local floodplain management capacity and reduce repetitive flood risk.

Status of Previous Mitigation Actions

Washington County and its communities have participated in previous iterations of the multi-jurisdictional hazard mitigation plan and identified strategies to mitigate natural hazard risks. Describing the status of previous mitigation actions helps demonstrate the ongoing progress made to reduce risk and the communities' commitment to mitigation. At the same time, it serves as an opportunity to evaluate whether an incomplete action is still worth pursuing. The following table preserves prior actions and distinguishes current strategy concepts from implementation status. Dated project records or participant findings are not available to establish completion, continued implementation, or removal.

Table 71 describes progress made on the mitigation actions identified for communities in Washington County in the 2022–2027 hazard mitigation plan.

Table 192: Status of 2022–2027 Mitigation Actions for Washington County

Action Identifier	Action	Status and Explanation
WAS-2022-DR-01	Assess county owned facilities and replace unused turf landscaping with drought tolerant vegetation	Status Unknown / Unable to Verify. Implementation status is not established by dated project or participant records. The corresponding risk-reduction concept is included in the current strategy through FCA-DR-03.
WAS-2022-EH-01	Develop & publish a list of public facilities which could be used as daytime cooling centers. List would be posted to the County EM[297] Facebook page during severe heat events.	Status Unknown / Unable to Verify. Implementation status is not established by dated project or participant records. The corresponding risk-reduction concept is included in the current strategy through FCA-EH-03.
WAS-2022-WI-01	Develop a toolkit with wildfire mitigation information and practices. Distribute to unincorporated communities, encouraging the use of a wildfire committee or council. Assist council in facilitating fuels mitigation.	Status Unknown / Unable to Verify. Implementation status is not established by dated project or participant records. The corresponding risk-reduction concept is included in the current strategy through FCA-WI-04.
WAS-2022-FL-01	Assess detention basins and river crossings near Dammeron Valley and	Status Unknown / Unable to Verify. Implementation status is not established by dated project or participant records. The

[297] EM = Emergency Management

Action Identifier	Action	Status and Explanation
	Gunlock for capacity. Where needed, repair or expand infrastructure.	corresponding risk-reduction concept is included in the current strategy through FCA-FL-06.
WAS-2022-LS-01	Prepare and distribute a pamphlet regarding landslide and rockfall risks. Start a public education campaign communicating landslide and rockfall risks to new property owners at the time of sale.	Status Unknown / Unable to Verify. Implementation status is not established by dated project or participant records. The corresponding risk-reduction concept is included in the current strategy through FCA-LS-04.
WAS-2022-LS-02	Inventory bank stability and landslide risks on the Virgin River. Where identified, implement bank stabilization measures.	Status Unknown / Unable to Verify. Implementation status is not established by dated project or participant records. The corresponding risk-reduction concept is included in the current strategy through FCA-LS-05.
WAS-2022-EQ-01	Complete an assessment of Enterprise Elementary to determine the extent of URM and identify structural or nonstructural retrofit needs.	Status Unknown / Unable to Verify. Implementation status is not established by dated project or participant records. The corresponding risk-reduction concept is included in the current strategy through FCA-EQ-01.
WAS-2022-EQ-02	Complete an assessment of Dixie High School ROTC[298] building to determine the extent of URM and identify structural or nonstructural retrofit needs.	Status Unknown / Unable to Verify. Implementation status is not established by dated project or participant records. The corresponding risk-reduction concept is included in the current strategy through FCA-EQ-01.
WAS-2022-EQ-03	Complete an assessment of Springdale School to determine the extent of URM and identify structural or nonstructural retrofit needs.	Status Unknown / Unable to Verify. Implementation status is not established by dated project or participant records. The corresponding risk-reduction concept is included in the current strategy through FCA-EQ-01.
WAS-2022-EQ-04	Inventory County owned buildings built or have portions of the structure constructed before seismic code implementation.	Status Unknown / Unable to Verify. Implementation status is not established by dated project or participant records. The corresponding risk-reduction concept is included in the current strategy through FCA-EQ-01.

[298] ROTC = Reserve Officers' Training Corps

Action Identifier	Action	Status and Explanation
WAS-2022-EQ-05	Using inventory results, implement needed seismic retrofits to secure County facilities.	Status Unknown / Unable to Verify. Implementation status is not established by dated project or participant records. The corresponding risk-reduction concept is included in the current strategy through FCA-EQ-01, FCA-EQ-02.
WAS-2022-EQ-06	Continue County and regional training, equipment, and education for emergency responders during earthquake events. Engage in regular trainings and equipment maintenance.	Status Unknown / Unable to Verify. Implementation status is not established by dated project or participant records. The corresponding risk-reduction concept is included in the current strategy through FCA-EQ-01, FCA-EQ-02, FCA-EQ-03.
WAS-2022-EQ-07	Provide earthquake preparedness and response public outreach on the County emergency management Facebook Page annually.	Status Unknown / Unable to Verify. Implementation status is not established by dated project or participant records. The corresponding risk-reduction concept is included in the current strategy through FCA-EQ-03.
WAS-2022-RN-01	Develop a public education campaign for radon testing and mitigation in homes. Post information to the County emergency management Facebook page annually.	Status Unknown / Unable to Verify. Implementation status is not established by dated project or participant records. The corresponding risk-reduction concept is included in the current strategy through FCA-RN-01.
WAS-2022-PS-01	Adopt a Geologic Hazard Ordinance.	Status Unknown / Unable to Verify. Implementation status is not established by dated project or participant records. The corresponding risk-reduction concept is included in the current strategy through FCA-PS-04.

Mitigation Goals

The Washington County participants adopted the Five County AOG Region mitigation goals identified in the base plan, as follows:

- **Goal 1: Protect Life and Property.** Reduce long-term risk to people and public, private, residential, agricultural, and commercial property through appropriate structural and nonstructural mitigation measures.
  Objective: Apply structural and nonstructural measures that reduce injury, loss of life, property damage, and disruption.

- **Goal 2: Protect Critical Facilities, Infrastructure, and Community Lifelines.** Reduce risk to critical facilities, infrastructure systems, and community lifelines and improve continuity or rapid restoration of essential functions.
  Objective: Protect and improve the reliability, redundancy, and rapid restoration of critical facilities, infrastructure, and community lifelines.
- **Goal 3: Strengthen Public Education and Risk Communication.** Improve residents' and visitors' understanding of hazards and practical risk-reduction measures.
  Objective: Provide clear, accessible, and recurring hazard information that supports informed risk-reduction decisions and protective actions.
- **Goal 4: Strengthen Partnerships and Coordination.** Coordinate mitigation planning and implementation among participating jurisdictions and relevant public, private, nonprofit, and community partners.
  Objective: Strengthen coordination, information sharing, and shared implementation among jurisdictions and partner organizations.
- **Goal 5: Strengthen the Resilience of Emergency Services.** Reduce pre-disaster risk to emergency facilities, personnel, equipment, communications, access routes, and supporting systems.
  Objective: Improve the continuity, safety, and operational resilience of emergency facilities, personnel, equipment, communications, and access.
- **Goal 6: Protect and Use Natural Systems.** Protect, restore, and manage natural systems where those measures reduce natural hazard risk and provide compatible community benefits.
  Objective: Use compatible natural-resource and nature-based measures to reduce hazard impacts while supporting community and environmental benefits.

2027–2032 Mitigation Action Plan for Washington County

Participating jurisdictions within Washington County reviewed the regional mitigation action catalog and selected the actions most appropriate to their identified risks, vulnerabilities, capabilities, and development trends. Table 193 identifies the actions selected by each jurisdiction. The selected actions address the hazards prioritized in the county and community risk assessments and support achievement of the regional mitigation goals. Each participant has at least one action for each hazard identified as applicable in Table 160. The complete action descriptions, hazards addressed, vulnerabilities reduced, goals, responsible positions or agencies, potential partners and funding sources, implementation timeframes, estimated costs, and priorities are provided under the corresponding Action ID in Section 6.2, which is incorporated into this annex by reference. Jurisdictions will implement only those shared actions for which they are listed in Table 193.

Table 193: Washington County Jurisdiction Action Selection Matrix

Mitigation Action	Action Description	Jurisdictions
FCA-DF-01	Update dam-failure warning, evacuation, and public-information procedures for inundation areas.	Washington County; St. George; Washington City; Hurricane; Santa Clara; Ivins; La Verkin; Enterprise; Toquerville; Leeds; Virgin; Springdale; New Harmony; Rockville; Apple Valley; Hildale
FCA-DR-01	Prepare or update a drought-response and water-shortage plan with staged triggers and conservation measures.	Washington County; St. George; Washington City; Hurricane; Santa Clara; Ivins; La Verkin; Enterprise; Toquerville; Leeds; Virgin; Springdale; New Harmony; Rockville; Apple Valley; Hildale
FCA-DR-03	Reduce water demand through leak detection, efficient fixtures, irrigation upgrades, turf replacement, and waterwise landscaping.	Washington County
FCA-DW-01	Assess and retrofit vulnerable buildings, roofs, signs, rooftop equipment, communications, and utilities for wind loads.	Washington County; St. George; Washington City; Hurricane; Santa Clara; Ivins; La Verkin; Enterprise; Toquerville; Leeds; Virgin; Springdale; New Harmony; Rockville; Apple Valley; Hildale
FCA-EH-02	Develop a heat-response protocol using forecast triggers, facility hours, transportation options, and targeted notifications.	Washington County; St. George; Washington City; Hurricane; Santa Clara; Ivins; La Verkin; Enterprise; Toquerville; Leeds; Virgin; Springdale; New Harmony; Rockville; Apple Valley; Hildale
FCA-EH-03	Develop and publish a current list of public cooling locations and operating procedures for activation during severe heat events.	Washington County
FCA-EQ-01	Inventory and evaluate unreinforced masonry, older public buildings, schools, and critical facilities for retrofit.	Washington County; St. George; Washington City; Hurricane; Santa Clara; Ivins; La Verkin; Enterprise; Toquerville; Leeds; Virgin; Springdale; New Harmony; Rockville; Apple Valley; Hildale
FCA-EQ-02	Apply seismic codes, flexible utility connections, and equipment anchorage during construction and replacement.	Washington County

Mitigation Action	Action Description	Jurisdictions
FCA-EQ-03	Provide recurring earthquake-risk and nonstructural-mitigation outreach.	Washington County
FCA-FL-01	Prepare or update stormwater and drainage master plans and inventory culverts, bridges, washes, and detention facilities.	Washington County; St. George; Washington City; Hurricane; Santa Clara; Ivins; La Verkin; Enterprise; Toquerville; Leeds; Virgin; Springdale; New Harmony; Rockville; Apple Valley; Hildale
FCA-FL-06	Assess detention basins and river or wash crossings at identified priority locations; repair, expand, or replace deficient infrastructure based on findings.	Washington County
FCA-HA-01	Evaluate hail exposure and use impact-resistant roofing, glazing, and equipment protection during replacement or construction.	Washington County; St. George; Washington City; Hurricane; Santa Clara; Ivins; La Verkin; Enterprise; Toquerville; Leeds; Virgin; Springdale; New Harmony; Rockville; Apple Valley; Hildale
FCA-LS-01	Map, monitor, and evaluate landslide, rockfall, and debris-flow areas affecting development and infrastructure.	Washington County; St. George; Washington City; Hurricane; Santa Clara; Ivins; La Verkin; Enterprise; Toquerville; Leeds; Virgin; Springdale; New Harmony; Rockville; Apple Valley; Hildale
FCA-LS-04	Prepare and distribute landslide and rockfall risk information for residents, developers, real-estate professionals, and new property owners in mapped hazard areas.	Washington County
FCA-LS-05	Inventory riverbank and slope stability at priority locations and implement bank stabilization or slope treatments where instability threatens infrastructure or development.	Virgin; Washington County
FCA-PS-01	Require subsurface geotechnical investigation and foundation recommendations where problem soils may affect structures.	Washington County; St. George; Washington City; Hurricane; Santa Clara; Ivins; La Verkin; Enterprise; Toquerville; Leeds; Virgin; Springdale; New Harmony; Rockville; Apple Valley; Hildale
FCA-PS-04	Adopt or update a geologic-hazards ordinance establishing mapping, investigation, disclosure, review,	Washington County

Mitigation Action	Action Description	Jurisdictions
	and mitigation requirements for development in identified hazard areas.	
FCA-RN-01	Provide recurring radon-risk, testing, and mitigation information through public and partner channels.	Washington County; St. George; Washington City; Hurricane; Santa Clara; Ivins; La Verkin; Enterprise; Toquerville; Leeds; Virgin; Springdale; New Harmony; Rockville; Apple Valley; Hildale
FCA-TL-01	Install lightning and surge protection, grounding, backup power, and communications safeguards at critical facilities.	Washington County; St. George; Washington City; Hurricane; Santa Clara; Ivins; La Verkin; Enterprise; Toquerville; Leeds; Virgin; Springdale; New Harmony; Rockville; Apple Valley; Hildale
FCA-TO-01	Maintain tornado and severe-thunderstorm alerts, shelter guidance, and protective-action messaging.	Washington County; St. George; Washington City; Hurricane; Santa Clara; Ivins; La Verkin; Enterprise; Toquerville; Leeds; Virgin; Springdale; New Harmony; Rockville; Apple Valley; Hildale
FCA-WI-01	Adopt or update Wildland-Urban Interface standards for defensible space, access, water supply, and ignition-resistant construction.	Washington County; St. George; Washington City; Hurricane; Santa Clara; Ivins; La Verkin; Enterprise; Toquerville; Leeds; Virgin; Springdale; New Harmony; Rockville; Apple Valley; Hildale
FCA-WI-04	Develop and distribute a locally tailored wildfire mitigation toolkit for unincorporated communities and neighborhoods, including guidance for local committees, defensible space, and fuels projects.	Washington County
FCA-WS-01	Prioritize snow and ice control routes serving critical facilities, schools, and isolated communities.	Washington County; St. George; Washington City; Hurricane; Santa Clara; Ivins; La Verkin; Enterprise; Toquerville; Leeds; Virgin; Springdale; New Harmony; Rockville; Apple Valley; Hildale

Action Selection and Analysis

Participants considered the comprehensive range of regulatory, structural and infrastructure, natural-systems, education and awareness, and capability-building alternatives documented in Section 6.2 of the base plan. Selections were screened against participant-specific risk and vulnerability findings, existing and future development, available capabilities, technical feasibility, cost and anticipated benefits, administrative and legal feasibility, public and political support, environmental effects, funding potential,

and implementation timeframe. The regional prioritization process based on STAPLEE (social, technical, administrative, political, legal, economic, and environmental) criteria and planning-level cost-benefit review in Section 6.2 govern these selections. Actions designated High are pursued first when feasible; Moderate and Low actions remain part of the strategy and may advance as funding, partnerships, technical information, or implementation opportunities become available.

Plan Integration

Plan integration is the process of incorporating information from the hazard mitigation plan into other planning mechanisms or the governance structures that manage long-term community development and decision-making, including budgets, comprehensive plans, economic development strategies, and other long-range planning documents. Plan integration helps promote mitigation project implementation by incorporating data and actions across programs and day-to-day operations.

During planning team meetings, Washington County participants identified opportunities for integrating hazard mitigation into other local planning mechanisms, including comprehensive plans, capital improvement programs, infrastructure investment decisions, zoning regulations, emergency management activities, and public education efforts. Participants agreed that embedding mitigation objectives into existing local decision-making processes can improve long-term implementation and resilience outcomes.

Integration of the Prior Plan (2022–2027)

Table 73 summarizes what the available records establish about prior-plan integration; the existence of a planning mechanism does not establish that the prior plan was incorporated.

Table 194: Washington County Integration of the 2022–2027 Plan

Plan Participant	Description
Washington County	Washington County has planning and administrative mechanisms described in its capability assessment that can incorporate hazard information. The available records do not document how the prior mitigation plan wTable 71s incorporated into specific plans, ordinances, budgets, or projects; actual integration is not inferred from the existence of those mechanisms.
St. George	St. George has planning and administrative mechanisms described in its capability assessment that can incorporate hazard information. The available records do not document how the prior mitigation plan wTable 71s incorporated into specific plans, ordinances, budgets, or projects; actual integration is not inferred from the existence of those mechanisms.
Washington City	Washington City has planning and administrative mechanisms described in its capability assessment that can incorporate hazard information. The available records do not document how the prior mitigation plan wTable 71s

Plan Participant	Description
	incorporated into specific plans, ordinances, budgets, or projects; actual integration is not inferred from the existence of those mechanisms.
Hurricane	Hurricane has planning and administrative mechanisms described in its capability assessment that can incorporate hazard information. The available records do not document how the prior mitigation plan wTable 71s incorporated into specific plans, ordinances, budgets, or projects; actual integration is not inferred from the existence of those mechanisms.
Santa Clara	Santa Clara has planning and administrative mechanisms described in its capability assessment that can incorporate hazard information. The available records do not document how the prior mitigation plan wTable 71s incorporated into specific plans, ordinances, budgets, or projects; actual integration is not inferred from the existence of those mechanisms.
Ivins	Ivins has planning and administrative mechanisms described in its capability assessment that can incorporate hazard information. The available records do not document how the prior mitigation plan wTable 71s incorporated into specific plans, ordinances, budgets, or projects; actual integration is not inferred from the existence of those mechanisms.
La Verkin	La Verkin has planning and administrative mechanisms described in its capability assessment that can incorporate hazard information. The available records do not document how the prior mitigation plan wTable 71s incorporated into specific plans, ordinances, budgets, or projects; actual integration is not inferred from the existence of those mechanisms.
Enterprise	Enterprise has planning and administrative mechanisms described in its capability assessment that can incorporate hazard information. The available records do not document how the prior mitigation plan wTable 71s incorporated into specific plans, ordinances, budgets, or projects; actual integration is not inferred from the existence of those mechanisms.
Toquerville	Toquerville has planning and administrative mechanisms described in its capability assessment that can incorporate hazard information. The available records do not document how the prior mitigation plan wTable 71s incorporated into specific plans, ordinances, budgets, or projects; actual integration is not inferred from the existence of those mechanisms.
Leeds	Leeds has planning and administrative mechanisms described in its capability assessment that can incorporate hazard information. The available records do not document how the prior mitigation plan wTable 71s incorporated into specific plans, ordinances, budgets, or projects; actual integration is not inferred from the existence of those mechanisms.
Virgin	Virgin has planning and administrative mechanisms described in its capability assessment that can incorporate hazard information. The available records do not document how the prior mitigation plan wTable 71s incorporated into specific plans, ordinances, budgets, or projects; actual integration is not inferred from the existence of those mechanisms.

Plan Participant	Description
Springdale	Springdale has planning and administrative mechanisms described in its capability assessment that can incorporate hazard information. The available records do not document how the prior mitigation plan wTable 71s incorporated into specific plans, ordinances, budgets, or projects; actual integration is not inferred from the existence of those mechanisms.
New Harmony	New Harmony has planning and administrative mechanisms described in its capability assessment that can incorporate hazard information. The available records do not document how the prior mitigation plan wTable 71s incorporated into specific plans, ordinances, budgets, or projects; actual integration is not inferred from the existence of those mechanisms.
Rockville	Rockville has planning and administrative mechanisms described in its capability assessment that can incorporate hazard information. The available records do not document how the prior mitigation plan wTable 71s incorporated into specific plans, ordinances, budgets, or projects; actual integration is not inferred from the existence of those mechanisms.
Apple Valley	Apple Valley has planning and administrative mechanisms described in its capability assessment that can incorporate hazard information. The available records do not document how the prior mitigation plan wTable 71s incorporated into specific plans, ordinances, budgets, or projects; actual integration is not inferred from the existence of those mechanisms.
Hildale	Hildale has planning and administrative mechanisms described in its capability assessment that can incorporate hazard information. The available records do not document how the prior mitigation plan wTable 71s incorporated into specific plans, ordinances, budgets, or projects; actual integration is not inferred from the existence of those mechanisms.

Integration of the Current Plan (2027–2032)

The plan participants identified opportunities to integrate the 2027–2032 plan into other planning mechanisms, as documented in Table 195.

Table 195: Washington County Integration of the 2027–2032 Plan

Plan Participant	Description
Washington County	During annual plan monitoring, Washington County will review its selected actions with the responsible planning, engineering, public works, utility, building, floodplain, emergency management, finance, or administrative functions identified in Section 6.2. When the General Plan, zoning or subdivision regulations, building or floodplain procedures, capital improvement program, annual budget, utility or transportation plans, emergency operations materials, development reviews, or public outreach materials are prepared or amended, the responsible local function will

Plan Participant	Description
	evaluate and incorporate applicable hazard information and mitigation actions. Washington County will document the mechanism reviewed, decision made, responsible function, and implementation status in the annual maintenance record.
St. George	During annual plan monitoring, St. George will review its selected actions with the responsible planning, engineering, public works, utility, building, floodplain, emergency management, finance, or administrative functions identified in Section 6.2. When the General Plan, zoning or subdivision regulations, building or floodplain procedures, capital improvement program, annual budget, utility or transportation plans, emergency operations materials, development reviews, or public outreach materials are prepared or amended, the responsible local function will evaluate and incorporate applicable hazard information and mitigation actions. St. George will document the mechanism reviewed, decision made, responsible function, and implementation status in the annual maintenance record.
Washington City	During annual plan monitoring, Washington City will review its selected actions with the responsible planning, engineering, public works, utility, building, floodplain, emergency management, finance, or administrative functions identified in Section 6.2. When the General Plan, zoning or subdivision regulations, building or floodplain procedures, capital improvement program, annual budget, utility or transportation plans, emergency operations materials, development reviews, or public outreach materials are prepared or amended, the responsible local function will evaluate and incorporate applicable hazard information and mitigation actions. Washington City will document the mechanism reviewed, decision made, responsible function, and implementation status in the annual maintenance record.
Hurricane	During annual plan monitoring, Hurricane will review its selected actions with the responsible planning, engineering, public works, utility, building, floodplain, emergency management, finance, or administrative functions identified in Section 6.2. When the General Plan, zoning or subdivision regulations, building or floodplain procedures, capital improvement program, annual budget, utility or transportation plans, emergency operations materials, development reviews, or public outreach materials are prepared or amended, the responsible local function will evaluate and incorporate applicable hazard information and mitigation actions. Hurricane will document the mechanism reviewed, decision made, responsible function, and implementation status in the annual maintenance record.
Santa Clara	During annual plan monitoring, Santa Clara will review its selected actions with the responsible planning, engineering, public works, utility, building, floodplain, emergency management, finance, or administrative functions identified in Section 6.2. When the General Plan, zoning or subdivision regulations, building or floodplain procedures, capital improvement program, annual budget, utility or transportation plans, emergency operations

Plan Participant	Description
	materials, development reviews, or public outreach materials are prepared or amended, the responsible local function will evaluate and incorporate applicable hazard information and mitigation actions. Santa Clara will document the mechanism reviewed, decision made, responsible function, and implementation status in the annual maintenance record.
Ivins	During annual plan monitoring, Ivins will review its selected actions with the responsible planning, engineering, public works, utility, building, floodplain, emergency management, finance, or administrative functions identified in Section 6.2. When the General Plan, zoning or subdivision regulations, building or floodplain procedures, capital improvement program, annual budget, utility or transportation plans, emergency operations materials, development reviews, or public outreach materials are prepared or amended, the responsible local function will evaluate and incorporate applicable hazard information and mitigation actions. Ivins will document the mechanism reviewed, decision made, responsible function, and implementation status in the annual maintenance record.
La Verkin	During annual plan monitoring, La Verkin will review its selected actions with the responsible planning, engineering, public works, utility, building, floodplain, emergency management, finance, or administrative functions identified in Section 6.2. When the General Plan, zoning or subdivision regulations, building or floodplain procedures, capital improvement program, annual budget, utility or transportation plans, emergency operations materials, development reviews, or public outreach materials are prepared or amended, the responsible local function will evaluate and incorporate applicable hazard information and mitigation actions. La Verkin will document the mechanism reviewed, decision made, responsible function, and implementation status in the annual maintenance record.
Enterprise	During annual plan monitoring, Enterprise will review its selected actions with the responsible planning, engineering, public works, utility, building, floodplain, emergency management, finance, or administrative functions identified in Section 6.2. When the General Plan, zoning or subdivision regulations, building or floodplain procedures, capital improvement program, annual budget, utility or transportation plans, emergency operations materials, development reviews, or public outreach materials are prepared or amended, the responsible local function will evaluate and incorporate applicable hazard information and mitigation actions. Enterprise will document the mechanism reviewed, decision made, responsible function, and implementation status in the annual maintenance record.
Toquerville	During annual plan monitoring, Toquerville will review its selected actions with the responsible planning, engineering, public works, utility, building, floodplain, emergency management, finance, or administrative functions identified in Section 6.2. When the General Plan, zoning or subdivision regulations, building or floodplain procedures, capital improvement program, annual budget, utility or transportation plans, emergency operations

Plan Participant	Description
	materials, development reviews, or public outreach materials are prepared or amended, the responsible local function will evaluate and incorporate applicable hazard information and mitigation actions. Toquerville will document the mechanism reviewed, decision made, responsible function, and implementation status in the annual maintenance record.
Leeds	During annual plan monitoring, Leeds will review its selected actions with the responsible planning, engineering, public works, utility, building, floodplain, emergency management, finance, or administrative functions identified in Section 6.2. When the General Plan, zoning or subdivision regulations, building or floodplain procedures, capital improvement program, annual budget, utility or transportation plans, emergency operations materials, development reviews, or public outreach materials are prepared or amended, the responsible local function will evaluate and incorporate applicable hazard information and mitigation actions. Leeds will document the mechanism reviewed, decision made, responsible function, and implementation status in the annual maintenance record.
Virgin	During annual plan monitoring, Virgin will review its selected actions with the responsible planning, engineering, public works, utility, building, floodplain, emergency management, finance, or administrative functions identified in Section 6.2. When the General Plan, zoning or subdivision regulations, building or floodplain procedures, capital improvement program, annual budget, utility or transportation plans, emergency operations materials, development reviews, or public outreach materials are prepared or amended, the responsible local function will evaluate and incorporate applicable hazard information and mitigation actions. Virgin will document the mechanism reviewed, decision made, responsible function, and implementation status in the annual maintenance record.
Springdale	During annual plan monitoring, Springdale will review its selected actions with the responsible planning, engineering, public works, utility, building, floodplain, emergency management, finance, or administrative functions identified in Section 6.2. When the General Plan, zoning or subdivision regulations, building or floodplain procedures, capital improvement program, annual budget, utility or transportation plans, emergency operations materials, development reviews, or public outreach materials are prepared or amended, the responsible local function will evaluate and incorporate applicable hazard information and mitigation actions. Springdale will document the mechanism reviewed, decision made, responsible function, and implementation status in the annual maintenance record.
New Harmony	During annual plan monitoring, New Harmony will review its selected actions with the responsible planning, engineering, public works, utility, building, floodplain, emergency management, finance, or administrative functions identified in Section 6.2. When the General Plan, zoning or subdivision regulations, building or floodplain procedures, capital improvement program, annual budget, utility or transportation plans, emergency operations

Plan Participant	Description
	materials, development reviews, or public outreach materials are prepared or amended, the responsible local function will evaluate and incorporate applicable hazard information and mitigation actions. New Harmony will document the mechanism reviewed, decision made, responsible function, and implementation status in the annual maintenance record.
Rockville	During annual plan monitoring, Rockville will review its selected actions with the responsible planning, engineering, public works, utility, building, floodplain, emergency management, finance, or administrative functions identified in Section 6.2. When the General Plan, zoning or subdivision regulations, building or floodplain procedures, capital improvement program, annual budget, utility or transportation plans, emergency operations materials, development reviews, or public outreach materials are prepared or amended, the responsible local function will evaluate and incorporate applicable hazard information and mitigation actions. Rockville will document the mechanism reviewed, decision made, responsible function, and implementation status in the annual maintenance record.
Apple Valley	During annual plan monitoring, Apple Valley will review its selected actions with the responsible planning, engineering, public works, utility, building, floodplain, emergency management, finance, or administrative functions identified in Section 6.2. When the General Plan, zoning or subdivision regulations, building or floodplain procedures, capital improvement program, annual budget, utility or transportation plans, emergency operations materials, development reviews, or public outreach materials are prepared or amended, the responsible local function will evaluate and incorporate applicable hazard information and mitigation actions. Apple Valley will document the mechanism reviewed, decision made, responsible function, and implementation status in the annual maintenance record.
Hildale	During annual plan monitoring, Hildale will review its selected actions with the responsible planning, engineering, public works, utility, building, floodplain, emergency management, finance, or administrative functions identified in Section 6.2. When the General Plan, zoning or subdivision regulations, building or floodplain procedures, capital improvement program, annual budget, utility or transportation plans, emergency operations materials, development reviews, or public outreach materials are prepared or amended, the responsible local function will evaluate and incorporate applicable hazard information and mitigation actions. Hildale will document the mechanism reviewed, decision made, responsible function, and implementation status in the annual maintenance record.

Continued Public Involvement

The plan participants are committed to implementing the plan maintenance process outlined in the base plan. At the same time, they have evaluated their own opportunities to ensure the public has an

opportunity to be involved in the plan maintenance and update process. Table 75 shows the continued public involvement approach for each plan participant.

Table 196: Continued Public Involvement Approach for Washington County

Plan Participant	Approach
Washington County	At least annually during plan monitoring and whenever a material plan amendment or five-year update is proposed, Washington County will use official notices, public meetings, its website or other established communication channels, and coordination with Washington County and Five County AOG to share implementation updates, provide access to proposed changes and draft materials, advertise opportunities for review, and accept public comments. The jurisdiction's designated plan-maintenance representative will compile comments and document how comments were considered.
St. George	At least annually during plan monitoring and whenever a material plan amendment or five-year update is proposed, St. George will use official notices, public meetings, its website or other established communication channels, and coordination with Washington County and Five County AOG to share implementation updates, provide access to proposed changes and draft materials, advertise opportunities for review, and accept public comments. The jurisdiction's designated plan-maintenance representative will compile comments and document how comments were considered.
Washington City	At least annually during plan monitoring and whenever a material plan amendment or five-year update is proposed, Washington City will use official notices, public meetings, its website or other established communication channels, and coordination with Washington County and Five County AOG to share implementation updates, provide access to proposed changes and draft materials, advertise opportunities for review, and accept public comments. The jurisdiction's designated plan-maintenance representative will compile comments and document how comments were considered.
Hurricane	At least annually during plan monitoring and whenever a material plan amendment or five-year update is proposed, Hurricane will use official notices, public meetings, its website or other established communication channels, and coordination with Washington County and Five County AOG to share implementation updates, provide access to proposed changes and draft materials, advertise opportunities for review, and accept public comments. The jurisdiction's designated plan-maintenance representative will compile comments and document how comments were considered.
Santa Clara	At least annually during plan monitoring and whenever a material plan amendment or five-year update is proposed, Santa Clara will use official notices, public meetings, its website or other established communication channels, and coordination with Washington County and Five County AOG to share implementation updates, provide access to proposed changes and draft materials, advertise opportunities for review, and accept public comments.

Plan Participant	Approach
	The jurisdiction's designated plan-maintenance representative will compile comments and document how comments were considered.
Ivins	At least annually during plan monitoring and whenever a material plan amendment or five-year update is proposed, Ivins will use official notices, public meetings, its website or other established communication channels, and coordination with Washington County and Five County AOG to share implementation updates, provide access to proposed changes and draft materials, advertise opportunities for review, and accept public comments. The jurisdiction's designated plan-maintenance representative will compile comments and document how comments were considered.
La Verkin	At least annually during plan monitoring and whenever a material plan amendment or five-year update is proposed, La Verkin will use official notices, public meetings, its website or other established communication channels, and coordination with Washington County and Five County AOG to share implementation updates, provide access to proposed changes and draft materials, advertise opportunities for review, and accept public comments. The jurisdiction's designated plan-maintenance representative will compile comments and document how comments were considered.
Enterprise	At least annually during plan monitoring and whenever a material plan amendment or five-year update is proposed, Enterprise will use official notices, public meetings, its website or other established communication channels, and coordination with Washington County and Five County AOG to share implementation updates, provide access to proposed changes and draft materials, advertise opportunities for review, and accept public comments. The jurisdiction's designated plan-maintenance representative will compile comments and document how comments were considered.
Toquerville	At least annually during plan monitoring and whenever a material plan amendment or five-year update is proposed, Toquerville will use official notices, public meetings, its website or other established communication channels, and coordination with Washington County and Five County AOG to share implementation updates, provide access to proposed changes and draft materials, advertise opportunities for review, and accept public comments. The jurisdiction's designated plan-maintenance representative will compile comments and document how comments were considered.
Leeds	At least annually during plan monitoring and whenever a material plan amendment or five-year update is proposed, Leeds will use official notices, public meetings, its website or other established communication channels, and coordination with Washington County and Five County AOG to share implementation updates, provide access to proposed changes and draft materials, advertise opportunities for review, and accept public comments. The jurisdiction's designated plan-maintenance representative will compile comments and document how comments were considered.

Plan Participant	Approach
Virgin	At least annually during plan monitoring and whenever a material plan amendment or five-year update is proposed, Virgin will use official notices, public meetings, its website or other established communication channels, and coordination with Washington County and Five County AOG to share implementation updates, provide access to proposed changes and draft materials, advertise opportunities for review, and accept public comments. The jurisdiction's designated plan-maintenance representative will compile comments and document how comments were considered.
Springdale	At least annually during plan monitoring and whenever a material plan amendment or five-year update is proposed, Springdale will use official notices, public meetings, its website or other established communication channels, and coordination with Washington County and Five County AOG to share implementation updates, provide access to proposed changes and draft materials, advertise opportunities for review, and accept public comments. The jurisdiction's designated plan-maintenance representative will compile comments and document how comments were considered.
New Harmony	At least annually during plan monitoring and whenever a material plan amendment or five-year update is proposed, New Harmony will use official notices, public meetings, its website or other established communication channels, and coordination with Washington County and Five County AOG to share implementation updates, provide access to proposed changes and draft materials, advertise opportunities for review, and accept public comments. The jurisdiction's designated plan-maintenance representative will compile comments and document how comments were considered.
Rockville	At least annually during plan monitoring and whenever a material plan amendment or five-year update is proposed, Rockville will use official notices, public meetings, its website or other established communication channels, and coordination with Washington County and Five County AOG to share implementation updates, provide access to proposed changes and draft materials, advertise opportunities for review, and accept public comments. The jurisdiction's designated plan-maintenance representative will compile comments and document how comments were considered.
Apple Valley	At least annually during plan monitoring and whenever a material plan amendment or five-year update is proposed, Apple Valley will use official notices, public meetings, its website or other established communication channels, and coordination with Washington County and Five County AOG to share implementation updates, provide access to proposed changes and draft materials, advertise opportunities for review, and accept public comments. The jurisdiction's designated plan-maintenance representative will compile comments and document how comments were considered.
Hildale	At least annually during plan monitoring and whenever a material plan amendment or five-year update is proposed, Hildale will use official notices, public meetings, its website or other established communication channels, and coordination with Washington County and Five County AOG to share

Plan Participant	Approach
	implementation updates, provide access to proposed changes and draft materials, advertise opportunities for review, and accept public comments. The jurisdiction's designated plan-maintenance representative will compile comments and document how comments were considered.

Conclusion

Washington County and its participating municipalities share exposure to the regional hazards profiled in the base plan, but consequences vary by terrain, development pattern, visitation, infrastructure, and local capability. This annex documents participant-specific hazard applicability, vulnerabilities and impacts, capabilities and opportunities for improvement, prior-action status, current action selections, plan integration, and continued public involvement. Dated implementation records are not sufficient to establish action completion, actual development-related vulnerability changes, or all participant-specific NFIP administration findings.

THIS PAGE INTENTIONALLY LEFT BLANK

Appendix A: Abbreviations

Appendix A: Abbreviations

Abbreviation	Definition
ACS	American Community Survey
AICP	American Institute of Certified Planners
AOG	Association of Governments
ATSDR	Agency for Toxic Substances and Disease Registry
BLM	Bureau of Land Management
CDBG	Community Development Block Grant
CDC	Centers for Disease Control and Prevention
CEO	chief executive officer
CFR	Code of Federal Regulations
CICWCD	Central Iron County Water Conservancy District
CRS	Community Rating System
CSV	comma-separated values
CWPP	Community Wildfire Protection Plan
DEQ	Department of Environmental Quality
DMV	Division of Motor Vehicles
DNR	Utah Department of Natural Resources
DR	major disaster declaration (FEMA declaration number prefix)
DTA	Direct Technical Assistance
EF	Enhanced Fujita (Scale)
EFU	Enhanced Fujita Scale, unknown rating
EI	Expansion Index
EM	Emergency Management
EMS	emergency medical services
EMT	emergency medical technician
ENH	Enhanced (Storm Prediction Center risk category)
EO	executive order
EPA	U.S. Environmental Protection Agency
FCAOG	Five County Association of Governments
FEMA	Federal Emergency Management Agency

Abbreviation	Definition
FIRM	Flood Insurance Rate Map
FM	Fire Management Assistance declaration (FEMA declaration number prefix)
FY	fiscal year
GIS	geographic information system
HMGP	Hazard Mitigation Grant Program
HMP	hazard mitigation plan
HVAC	heating, ventilation, and air conditioning
I	Interstate (as in I-15)
ID	identification
km/h	kilometers per hour
LAL	Lightning Activity Level
LiDAR	light detection and ranging
LOMR	Letter of Map Revision
MDT	Moderate (Storm Prediction Center risk category)
MDT	Mountain Daylight Time
mm	millimeter(s)
MMI	Modified Mercalli Intensity
mph	miles per hour
MRGL	Marginal (Storm Prediction Center risk category)
NCA5	Fifth National Climate Assessment
NCEI	National Centers for Environmental Information
NFDRS	National Fire Danger Rating System
NFIP	National Flood Insurance Program
NICC	National Interagency Coordination Center
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRI	National Risk Index
NSFHA	No Special Flood Hazard Area
NSHM	National Seismic Hazard Model
NSSL	National Severe Storms Laboratory

Abbreviation	Definition
NWS	National Weather Service
pCi/L	picocuries per liter
Risk MAP	Risk Mapping, Assessment, and Planning
ROTC	Reserve Officers' Training Corps
RV	recreational vehicle
SFHA	Special Flood Hazard Area
SHMP	State Hazard Mitigation Plan
SLGT	Slight (Storm Prediction Center risk category)
SR	State Route
SSURGO	Soil Survey Geographic Database
STAPLEE	social, technical, administrative, political, legal, economic, and environmental
SWUPHD	Southwest Utah Public Health Department
TORRO	Tornado and Storm Research Organisation
UDEM	Utah Division of Emergency Management
UDOT	Utah Department of Transportation
UGS	Utah Geological Survey
URM	unreinforced masonry
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USGS	U.S. Geological Survey
USU	Utah State University
UTA	Utah Transit Authority
VOAD	Voluntary Organizations Active in Disaster
WSSI	Winter Storm Severity Index
WUI	wildland-urban interface