7505 S Holden Street
Midvale, UT 84047
801-567-7200 ext. 1022
Midvale.Utah.gov

Midvale Planning Commission Meeting
Notice and Agenda
September 10, 2025
6:00 p.m.

Public notice is hereby given that the Midvale City Planning Commission will consider the items listed below during their regularly scheduled meeting on Wednesday, September 10, 2025, at 6:00 p.m. This meeting will be held in person at Midvale City Hall, 7505 S Holden Street, Midvale, Utah or electronically with an anchor location at Midvale City Hall, 7505 S Holden Street, Midvale, Utah. The meeting will be broadcast at the following link: Midvale.Utah.gov/YouTube.

Midvale City Staff publishes a packet of information containing item specific details one week prior to the meeting at 6:00 p.m. on the Planning Commission Agendas & Minutes page. The QR code included on the right will also take you to this webpage.

Public comments for Public Hearing items may be done in person on the scheduled meeting date, submitted electronically on the Agendas & Minutes webpage, or by emailing planning@midvaleut.gov by 5:00 p.m. on September 9, 2025 to be included in the record.

I. Pledge of Allegiance

II. Roll Call

III. Minutes

a. Review and Approval of Minutes from the August 27, 2025 Meeting.

IV. Public Hearing

*Items with ** if forwarded, the Planning Commission recommendation on this item will be considered by the City Council as the Legislative Body, at a Public Hearing on October 7, 2025 at 7 p.m.*

a. Kim Hertig requests approval of a Conditional Use Permit for a Vehicle Repair (Automobile accessory shop – KS Audio) to be located at 661 W 7250 S in the Clean Industrial (CI) Zone. *[Jonathan Anderson, Planner II].*

b. **Midvale City initiated request to amend several Sections within chapter 17-7-11 of the Midvale City Municipal Code entitled Main Street Form Based Code. The amendments clarify provisions related to noise, outdoor dining, cooking, light pollution, signage, and building uses. *[Wendelin Knobloch, Planning Director]*

c. **Midvale City Water Use and Preservation Element of the General Plan. *[Wendelin Knobloch, Planning Director]*

V. Discussion Items

a. Discussion on Unoccupied Accessory Structure and External Accessory Dwelling Unit Standards relating to allowed height and building areas. *[Jonathan Anderson, Planner II]*

VI. Staff Update/Other Business

a. Land Use Training: Ground Rules Chapters 13&14

b. Planning Department Report.

VII. Adjourn

All meetings are open to the public; however, there is no public participation except during public hearings. Members of the public will be given an opportunity to address the Commission during each public hearing item. The Commission reserves the right to amend the order of the agenda if deemed appropriate. No item will be heard after 9:30 p.m. without unanimous consent of the Commission. Items not heard will be scheduled on the next agenda. In accordance with the Americans with Disabilities Act, Midvale City will make reasonable accommodations for participation in the meeting. Request assistance by contacting the Community Development Executive Assistant at (801) 567-7211, providing at least three working days' notice of the meeting.

A copy of the foregoing agenda was posted in the City Hall Lobby, the 2nd Floor City Hall Lobby, on the City's website at Midvale.Utah.gov and the State Public Notice website at http://pmn.utah.gov. Commission Members may participate in the meeting via electronic communication. Commission Members' participation via electronic communication will be broadcast and amplified so all Commission Members and persons present in the Council Chambers will be able to hear or see the communication.

Affected entities for **IV. Public Hearing Item c** are invited to provide any relevant information to consider in the process of preparing, adopting, and implementing a general plan or amendment concerning: 1) impacts that the use of land proposed in the proposed general plan or amendment may have; and 2) uses of land within the municipality that the entity is considering that may conflict with the proposed general plan or amendment.

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Midvale City
PLANNING AND ZONING COMMISSION
Minutes
27th Day of August 2025
Council Chambers
7505 South Holden Street
Midvale, Utah 84047

COMMISSION CHAIR: Robyn Anderson

COMMISSION VICE CHAIR: Candice Erickson

COMMISSION MEMBERS: Dustin Snow
Michael Edwards
Shane Liedtke
Candace Tippetts
Matt Kasparian

STAFF: Adam Olsen, Community Development Director
Katie Thorne, Community Development Exec. Assistant
Daniel Van Beuge, Deputy City Attorney
Wendelin Knobloch, Planning Director
Elizabeth Arnold, Senior Planner
Jonathan Anderson, Planner II
Matthew Pierce, IT Director

REGULAR MEETING

Chair Anderson called the Planning & Zoning Commission meeting to order at 6:00 p.m. She explained how the meeting would proceed. First, the Planning Department would brief the Commission; then the applicant would speak to the Commission; the item will be opened to the public for their comments on public hearing agenda items; the Midvale Deputy City Attorney will then brief the Commission on their role on the given item; and then the Commission would deliberate and decide.

ROLL CALL

Chair Anderson	Present
Vice Chair Erickson	Excused
Commissioner Tippetts	Present
Commissioner Snow	Present
Commissioner Liedtke	Present
Commissioner Edwards	Present
Commissioner Kasparian	Present

***

MINUTES

1. REVIEW AND APPROVE MINUTES OF JUNE 11, 2025.

MOTION: Commissioner Liedtke MOVED to approve the minutes of August 13, 2025. SECONDED by Commissioner Snow. Chair Anderson called for a voice vote.

The motion passed unanimously with all voting in favor.

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PUBLIC HEARINGS

1. Carl Greene requests Preliminary Subdivision approval for a 3-lot subdivision located at 8253 S Main St in the Multifamily Residential-Medium to High Density (RM-25) zone.

This proposal has been reviewed by all members of the Development Review Committee (Planning, Engineering, Public Works, Legal, Unified Fire Authority, and the Building Official) for compliance with the respective guidelines, policies, standards, and codes. Staff finds the proposal complies with the preliminary subdivision requirements in Midvale City Municipal Code 16.02, and the development standards of the RM-25 zone in 17-7-4.

Public notice has been sent to property owners within 500 feet of the subject parcel. No written objections have been received as of the writing of this report.

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STAFF RECOMMENDATION:

Based on compliance with the requirements of Chapter 16.02 and 17-7-4 of the Midvale City Municipal Code demonstrated in the application or addressed by the inclusion of conditions of approval, Staff recommends the Planning Commission approve the preliminary subdivision with the following findings:

Findings:

1. The application is for a preliminary subdivision to allow for a 3-lot subdivision located at 8253 S Main St.
2. The project complies with the preliminary subdivision procedure outlined in Midvale City Code 16.02 and the development standards of the RM-25 zone in 17-7-4.
3. The Development Review Committee has reviewed the project and forwarded the item on for the Planning Commission to render a decision.

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APPLICANT:

Carl Green, with McNeil Engineering**,** stated that he has been working in coordination with the property owner to redevelop the existing site into a multifamily residential community. As part of the project, several existing homes have been acquired to allow for site clearance and to maximize the development potential for multifamily housing. The current subdivision request is primarily administrative in nature, intended to update outdated survey data and dedicate necessary right-of-way easements to Midvale City to ensure compliance with current city standards and regulations.

***

PUBLIC HEARING:

Nelson Mark inquired about the building currently under construction along Main Street, specifically regarding the inclusion of commercial space on the ground floor and multifamily residential units on the upper levels. He also asked for clarification on the zoning changes that would permit multifamily housing in this area.

Chair Anderson and Commissioner Liedtke clarified that the existing zoning already permits multifamily residential use in this area. They further emphasized that the purpose of the current public hearing is limited to consideration of the proposed subdivision. Both Chair Anderson and Commissioner Liedtke encouraged Mr. Mark to contact the applicant directly for more detailed information about the scope and nature of the proposed development.

Wendelin Knobloch provided additional clarification that the underlying zoning code had previously been amended to allow for potential commercial use on the ground floor. However, the applicant has elected not to utilize that commercial option as part of the current development.

Elizabeth Arnold clarified that the applicant has already completed the necessary Site Plan and Building Permit approval processes. These approvals authorize the construction of two additional buildings, each designed to match the architectural style of the existing structures within the development, with a total of 24 residential units per building.

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MOTION: Commissioner Liedtke MOVED to close the public hearing. The motion was SECONDED by Commissioner Snow. Chair Anderson called for a voice vote. The motion passed unanimously with all voting in favor.

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DISCUSSION:

Daniel Van Beuge, Deputy City Attorney, informed the Commissioners that this is an administrative decision that the Planning Commission is to make if they do meet all the code requirements as it's outlaid in the city. If the proposed project does meet all code requirements, the Planning Commission is required to approve the proposed project plans. The only grounds for denial of this project would be if the code requirements are not met.

***

MOTION: Commissioner Liedtke MOVED that we approve the preliminary subdivision located at 8253 S Main St, with the findings noted in the staff report. The motion was SECONDED by Commissioner Tippetts. Chair Anderson called for a roll call vote. The vote was as follows:

Chair Anderson	Yes
Commissioner Tippetts	Yes
Commissioner Snow	Yes
Commissioner Liedtke	Yes
Commissioner Edwards	Yes
Commissioner Kasparian	Yes

The motion passes unanimously.

***

PUBLIC HEARINGS

2. Midvale City initiated request to amend various sections of the SF-1, SF-2, RM-12, and RM-25 zones of the Midvale City Municipal Code relating to master planned developments.

The existing master planned development standards have been consistently difficult to implement and are not providing the City's desired outcome. It is proposed that master planned developments are now only required for projects that include common area. Staff finds that development projects with common area require coordination and a variety of housing types where projects without common area do not. The amendment removes incentives to reduce variation between projects. Development requirements have been reduced to include only those that the city prioritizes and have straightforward interpretation. A new section has been added to allow building footprint lots. Additionally, parking requirements have been changed to require 2 off-street spaces per dwelling unit.

Public notice has been sent to affected entities as required in 17-3-9.B of the Municipal Code. No comments have been received as of the writing of this report.

-ZONING CODE AMENDMENT CRITERIA-

Midvale City Code 17-3-1(F) outlines the criteria necessary for amendments to the zoning code. A proposal may only be approved if it demonstrates one or more of the following:

1. The proposed amendment promotes the objectives of the general plan and purposes of this title;
2. The proposed amendment promotes the purposes outlined in Utah State Code 10-9a-102;
3. The proposed amendment more clearly explains the intent of the original language or has been amended to make interpretation more straightforward; or
4. Existing zoning code was the result of a clerical error or a mistake of fact.

Staff finds that this proposal meets the first and third criteria listed above.

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STAFF RECOMMENDATION:

Staff recommends the Planning Commission recommend approval of the text amendment with the following finding:

Findings:

1. The amendment complies with Midvale City Code 17-3-1(F)(1).

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APPLICANT:

No comment.

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PUBLIC HEARING:

No comment.

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MOTION: Commissioner Tippetts MOVED to close the public hearing. The motion was SECONDED by Commissioner Liedtke. Chair Anderson called for a voice vote. The motion passed unanimously with all voting in favor.

DISCUSSION:

Commissioner Liedtke requested and received clarification that the proposed text amendment would allow developers the option to build at 50% of the maximum allowed density. However, it was confirmed that this would not be a requirement; developers would still retain the option to build up to the full maximum capacity permitted by zoning.

Wendelin Knobloch clarified that the RM-12 and RM-25 zoning districts are not intended to drive all developments to the highest allowable density. Both zones currently permit single-family residential development in addition to multifamily options.

Commissioner Edwards sought and received clarification that the text amendment would allow Midvale City greater flexibility by moving away from rigid, pre-determined lot sizes, particularly in cases where common area is required.

The Planning Commission expressed concerns regarding the proposed parking standards included in the text amendment. Commissioners recommended revising the parking requirement from 2 parking stalls per unit to 2.5 stalls per unit, with the breakdown being 2 dedicated off-street stalls (excluding garages) and 0.5 off-street stalls per unit for guest parking.

Daniel Van Buege provided clarification that the ordinance could be revised to specify that garage spaces would not count toward the required off-street parking totals.

Elizabeth Arnold and Wendelin Knobloch confirmed that the Commissioners' concerns could be addressed by amending the proposed text to explicitly require 2.5 parking spaces per unit, with clear definitions for guest and non-garage parking.

Commissioner Snow raised additional concerns related to the inclusion of improved, nonmotorized trail linkages within the text amendment.

In response, Mr. Knobloch clarified that such trail linkages would be removed from the amendment to avoid potential complications when developments are not adjacent to existing trail networks. He added that in cases where a proposed development could serve as a future trail connection, the City should consider taking a more proactive approach, including the potential acquisition of such properties.

Commissioners Snow and Edwards also raised concerns regarding the removal of open space and common areas in future developments. They directed that staff research whether master planned developments should be required for projects over 2 acres with or without common area.

Elizabeth Arnold clarified that the intent of the text amendment is to consolidate existing open space and common area requirements. The proposal seeks to increase the amount of improved common areas within developments.

Jonathan Anderson noted that the minimum open space requirements for multifamily developments currently for the RM-12 and RM-25 zones are 15% and 20%.

The Planning Commission expressed a strong preference for increased parking requirements excluding garage spaces, enhanced open space provisions for multifamily developments, and a requirement that any project **over two acres** must submit a Master Planned Development (MPD) application. After discussion, the Planning Commission unanimously voted to table the item until the concerns are addressed, and the proposed text amendment is revised accordingly.

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3. **MOTION: Commissioner Liedtke MOVED that we table the Midvale City initiated request to amend various sections of the SF-1, SF-2, RM-12, and RM-25 zones of the Midvale City Municipal Code relating to master planned developments, pending staff research on the items discussed by the Planning Commission. The motion was SECONDED by Commissioner Edwards. Chair Anderson called for a roll call vote. The vote was as follows:**

Chair Anderson	Yes
Commissioner Tippetts	Yes
Commissioner Snow	Yes
Commissioner Liedtke	Yes
Commissioner Edwards	Yes
Commissioner Kasparian	Yes

The motion passes unanimously.

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STAFF UPDATE/OTHER BUSINESS

1. Land Use Trainings – Ground Rules Chapter 12
    a. What are Nonconforming Uses, Zoning Estoppels, and CC&R's?

2. Planning Department Report
    a. 2025 APA Utah Fall Conference – October 9-10, 2025, in Salt Lake City
    b. Planning Commission Dinner – September 18, 2025

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ADJOURN

Commissioner Edwards made the motion to adjourn 6:59 p.m. No one opposed. The meeting adjourned at 6:59 p.m.

_____
Katie Thorne, CD Executive Assistant

Approved this _____ day of _____2025.

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MIDVALE CITY PLANNING COMMISSION
STAFF REPORT
9/10/2025

SUBJECT

Kim Hertig requests approval of a Conditional Use Permit for a Vehicle Repair (Automobile accessory shop – KS Audio) to be located at 661 W 7250 S in the Clean Industrial (CI) Zone.

SUBMITTED BY

Jonathan Anderson, Planner II

BACKGROUND AND ANALYSIS

The applicant requests a Conditional Use Permit for a Vehicle Repair (Automobile accessory shop) to be located at 661 W 7250 S. The property currently contains an existing building with four leasable units with this business looking to operate out of one suite.

Public notice has been sent to property owners within 500 feet of the subject parcel; additionally, a sign was placed on the property and will remain until the Planning Commission hearing of the Conditional Use Permit. At the time of writing this report, no public comment has been received.

Midvale Municipal Code 17-7-13.9(A) outlines the criteria necessary for a conditional use permit as follows (Staff responses in **bold**):

1. The application complies with all applicable provisions of this title, state and federal law;
Response: The application complies with the above-listed criteria.

2. The structures associated with the use are compatible with surrounding structures in terms of use, scale, mass and circulation;
Response: Only existing structures will be utilized. Nearby structures consist of primarily commercial uses. The application complies with the above-listed criteria.

3. The use is not detrimental to the public health, safety and welfare;
Response: The application complies with the above-listed criteria.

4. The use is consistent with the general plan, as amended;
Response: The use is consistent with Midvale's General Plan.

5. Traffic conditions are not adversely affected by the proposed use including the existence of or need for dedicated turn lanes, pedestrian access, and capacity of the existing streets;
Response: The application was reviewed by Midvale City's Engineering Department and complies with the above-listed criteria.

6. Sufficient utility capacity;
Response: The application was reviewed by Midvale City's Engineering Department and complies with the above-listed criteria.

7. Sufficient emergency vehicle access;
Response: Emergency vehicle access was reviewed by the Unified Fire Authority and determined to be adequate.

8. Location and design of off-street parking as well as compliance with off-street parking standards provided for in Section 17-7-13.8;
Response: The application complies with the above-listed criteria and follows the provisions of the city ordinance for parking requirements.

9. Fencing, screening, and landscaping to separate the use from adjoining uses and mitigate the potential for conflict in uses;
Response: Adjoining uses are consistent with the Clean Industrial zone and commercial in nature. Additional separation is not needed as there is no conflict of uses identified.

10. Compatibility of the proposed mass, bulk, design, orientation, and location of the structures on the site, including compatibility with buildings on adjoining lots and to the street;
Response: Only existing structures will be utilized; no additions are proposed. The application complies with the above-listed criteria.

11. Exterior lighting that complies with the lighting standards of the zone and is designed to minimize conflict and light trespass with surrounding uses; and
Response: Only existing structure will be utilized; no additional lighting fixtures are proposed. The application complies with the above-listed criteria.

12. Within and adjoining the site, impacts on the aquifer, slope retention, flood potential and appropriateness of the proposed structure to the topography of the site.
Response: The application was reviewed by Midvale City's Engineering Department and complies with the above-listed criteria.

STAFF RECOMMENDATION

Staff recommends the Planning Commission approve the Conditional Use Permit with the following finding:

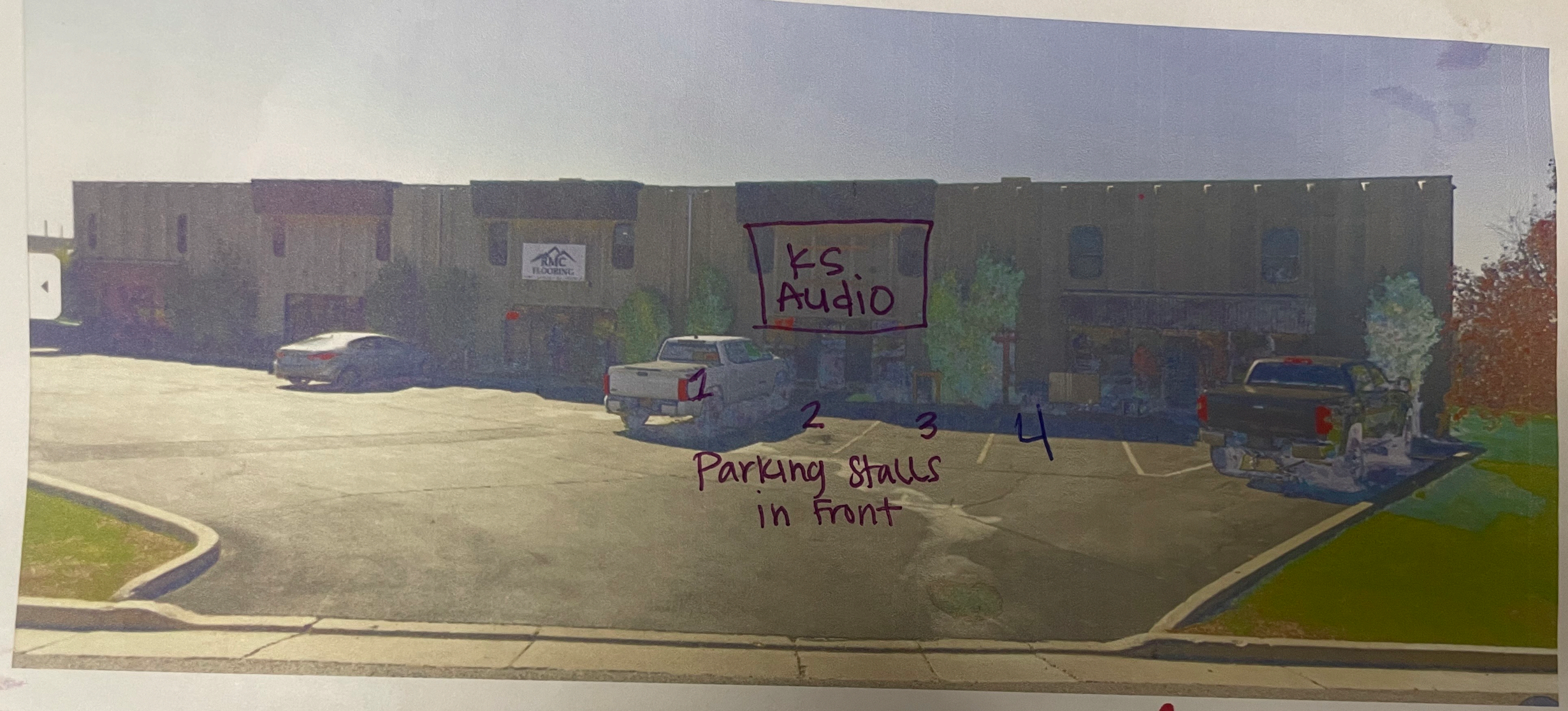
1. The project compiles with Midvale Municipal Code 17-7-13.9(A).

RECOMMENDED MOTION

I move that we approve the Conditional Use Permit for a Vehicle Repair (Automobile accessory shop) at 661 W 7250 S, with the finding noted in the staff report.

ATTACHMENTS

1. Parking Plan



East Side of building!

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MIDVALE CITY PLANNING COMMISSION
STAFF REPORT
9/10/2025

SUBJECT

Midvale City initiated amendment to section 17-7-11 entitled Main Street Form Based Code (MS-FBC) to clarify provisions regarding Use Placement, Outdoor Dining, Lighting, and Signage.

SUBMITTED BY

Wendelin Knobloch, Planning Director

BACKGROUND AND ANALYSIS

This code text amendment clarifies several provisions regarding placement of office uses, outdoor dining, lighting, and signage in the Main Street Form Based Code as shown in the attachment.

Public notice has been sent to affected entities as required in 17-3-9.B of the Municipal Code. No comments have been received as of this writing.

-ZONING CODE AMENDMENT CRITERIA-

Midvale City Code 17-3-1(F) outlines the criteria necessary for amendments to the zoning code. A proposal may only be approved if it demonstrates one or more of the following:

1. The proposed amendment promotes the objectives of the general plan and purposes of this title;
2. The proposed amendment promotes the purposes outlined in Utah State Code 10-9a-102;
3. The proposed amendment more clearly explains the intent of the original language or has been amended to make interpretation more straightforward; or
4. Existing zoning code was the result of a clerical error or a mistake of fact.

Staff finds that this proposal meets the first and third criteria listed above because code provisions are clarified and general plan principles such as walkability are strengthened through the proposed changes.

STAFF RECOMMENDATION

Staff advises the Planning Commission to recommend approval of the text amendment with the following finding:

1. The amendment complies with Midvale City Code 17-3-1(F)(1) and (3).

RECOMMENDED MOTION

I move that we recommend approval of the amendment to section 17-7-11 entitled Main Street Form Based Code (MS-FBC) to clarify provisions regarding use placement, outdoor dining, lighting, and signage as provided in the attachment with the finding noted in the staff report.

ATTACHMENTS

1. Code Changes

Chapter 17-7-11
MAIN STREET FORM-BASED CODE (MS-FBC)

Sections:

17-7-11.1 The Main Street neighborhood.

A. *The Main Street Neighborhood.*

1. The form-based code (FBC) for the Main Street district was developed in response to the city's previous planning projects. The 2016 general plan (GP) identifies the neighborhood as one of the city's "opportunity areas." The Main Street small area plan (SAP) was adopted in 2018 to further define what those opportunities are, develop more specific goals, and provide strategic projects to achieve those goals. Creating and adopting an FBC for the Main Street area is one of those strategic projects.

2. The FBC district is located in a unique place near the western edge of the city limits and between the recent Bingham Junction developments and the I-15 and railway corridor. It incorporates the historic Main Street and the surrounding light industrial and commercial properties. The FBC district boundary is shown in Figure 1.01.

Figure 1.01. Main Street Form-Based Code District Boundary

B. *Goals.*

1. The goals for the future of the Main Street neighborhood are presented in both the GP and SAP. These goals were developed over several years through various planning processes that included input from local residents, business and property owners, elected and professional members of the city government, and professional planning consultants.

2. The many goals for the Main Street neighborhood can be combined into one objective: create a vibrant, walkable town center. The individual goals include improved connectivity to the surrounding areas and TRAX station, bikeway connections, human-scale walkable development, both to preserve the historic character of Main Street and promote new development, greater use diversity, support existing businesses and attract new investment, strengthen residential areas, and improve neighborhood identity.

3. When implemented well, FBCs have been shown to produce more reliably predictable outcomes than traditional land use zoning. When preferred development goals are identified, an FBC can be customized to achieve the desired results. This FBC has been written and designed to meet the specific goals for the future of Midvale's Main Street neighborhood.

C. *History and Existing Conditions.*

1. Midvale City, formerly known as Bingham Junction, was established at an important railroad crossing and became a center of mining industries. From 1871 to 1987, several different companies operated a number of smelters, refineries, and mills just west of Main Street. These operations processed copper, lead, zinc, arsenic, silver, and cadmium from ores that originated from mines in both the Bingham and Little Cottonwood canyons. The Main Street neighborhood sprang up directly adjacent to these extensive ore industries and became the thriving downtown of Midvale City.

2. Since the height of the Midvale mining industry, the Main Street neighborhood has faced significant challenges. Main Street is no longer the commercial and social center of the city. It was incrementally isolated by the construction of I-15, freight and commuter railways, and the contaminated land left behind by the smelters.

3. Recent changes have added new value and activity to the neighborhoods around Main Street. The large Bingham Junction commercial and residential development on the previously contaminated smelter land, the TRAX light rail commuter station, and new buildings in the area, including City Hall, have given the neighborhood momentum for improvement. Recent planning efforts are guiding this momentum to produce a thriving town center type of neighborhood.

4. The Main Street neighborhood is zoned primarily for residential uses and was substantially developed prior to 1950. (Ord. 2024-28 § 1 (Att. A); Ord. 2022-03A § 1 (Att. H); Ord. 2020-04 § 1 (Att. A (part)))

17-7-11.2 Form districts.

A. *Form Districts.*

1. *Form District Types.*

a. This FBC defines two distinct types of form districts:

i. Main Street (MS);

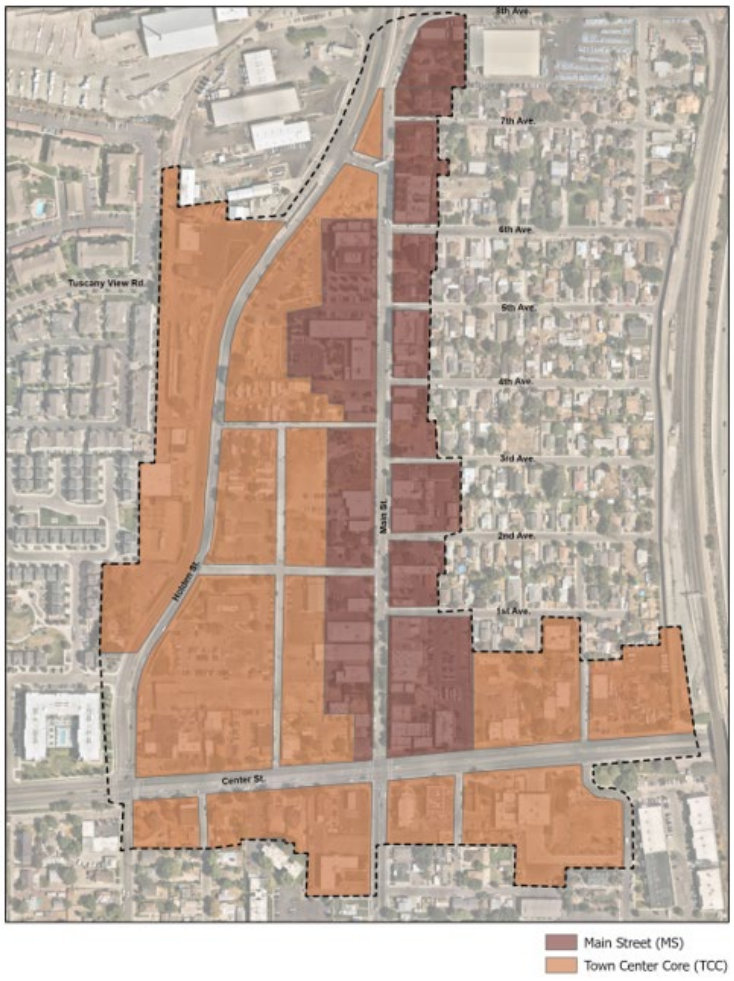
ii. Town center core (TCC).

b. Subsections (A) through (C) of this section provide descriptions and example images for each form district.

2. *Form District Map.*

a. Figure 2.01 is the form district map. This map indicates the form district designation for all of the parcels within the FBC area. Form district designations are made based on the geographic location of each parcel and the relationships between adjacent form districts and streets.

Figure 2.01. Form District Map



i. Most of the district boundaries between different form districts are drawn along existing parcel lines.

(A) Changes to form district designation for parcels along a form district boundary may be considered for approval by the community development director only if parcels on both sides of the boundary are to be developed as part of the same lot.

(1) Form district boundaries may deviate from parcel boundaries if the new form district boundary is clearly indicated and dimensioned on a site plan and is approved by the community development director.

(2) It is important to maintain the Main Street (MS) form district designation along both sides of Main Street, as shown in Figure 2.01. Any changes to an MS district boundary shall not remove the MS district designation from the Main Street frontage of a lot. All building facades along Main Street shall meet the use, frontage, and building type requirements of the MS form district.

ii. Form district boundaries that are not drawn along existing parcel lines have been drawn in anticipation of future changes in development patterns.

(A) This type of form district boundary is subject to change as future redevelopment occurs. Changes shall fit new parcel lines, not significantly change the size of the form district, and are to be made by the community development director.

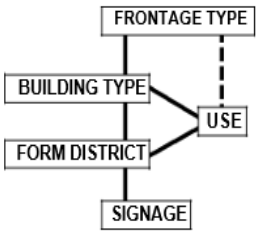
(B) For parcels containing multiple form district designations, those designations within the parcel may be changed, subject to approval by the community development director as part of the preliminary application process.

(C) Buildings may cross form district boundaries but are subject to the design requirements of each district in which each portion of the building is located.

3. *Form District and Correlated FBC Sections.*

a. The form district is one of the central organizing regulations within the FBC. Figure 2.02 shows the relationships between the major FBC regulations. These relationships take the form of permission and limitations for different combinations of the regulation parameters.

Figure 2.02. Correlations Between the Major FBC Regulations and Requirements



4. *Building Type and Use in Each Form District.*

a. Tables 2.01 and 2.02 describe the relationships between use, building type, and each form district. These tables compile information found in other sections of the FBC and are presented in this chapter as a quick reference between the permissions/limitations regarding use, building type, and the form district map. Section 17-7-11.3 governs allowed uses and provides additional detail on specific requirements.

B. *Main Street (MS) District.*

1. The unique character of Midvale's Main Street distinguishes it from the other streets in both the neighborhood and the city. Because of these distinctions, the goals for the MS form district differ from the other districts. The primary purpose of the MS district is to preserve and promote the building forms, historic character, and experience of the traditional main street.

2. The district boundary is drawn to include all land parcels that are adjacent to the Main Street right-of-way. This boundary allows the form of the entire street to be guided by the same form standards. This will build up a street that is continuously cohesive in its form, maintains the character of a traditional main street, and is legible as the city's historic Main Street.

3. The Main Street street type is unique to the MS district. This street type provides public space with the characteristics that are compatible with the existing and historic buildings and a pedestrian-oriented Main Street experience. Shared bike lanes along Main Street introduce additional connections and people.

4. Uses permitted in the MS district are compatible with both the permitted building types and with an active town center that serves the needs of local residents. Residential uses will help activate the MS district.

5. The primary frontage along Main Street ensures that buildings front directly on the street. This provides the spatial relationship between buildings and the street that supports the pedestrian nature and active use goals for the MS district.

Table 2.01. Main Street District:

Permitted Uses by Building Type and Floor Designation

Use	*Building Type*			
	General	**Limited Bay**	**Row**	**Civic**
Residential and Lodging	G+U	Not Permitted	G+U	N
Civic	G+U		N	G+U
Retail	G		G+U	N
Service	G		G+U	N
Office	U		U	N
Industrial	G+U		G+U	N
G+U = Ground and Upper	N = Not Permitted			

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Use	*Building Type*			
	General	**Limited Bay**	**Row**	**Civic**
Floors				
G = Ground Floor Only	U = Upper Floors Only			

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C. *Town Center Core (TCC) District.*

1. The primary purpose of this district is to guide development and redevelopment that will provide the physical and spatial forms that support a walkable, vibrant, and attractive town center. This expands the town center style development from Main Street to the greater neighborhood.

2. The TCC district is the largest district in the FBC area. The boundary is drawn to include properties along the major streets (Holden St./700 W., and Center St.) and parcels adjacent to those street-fronting properties. This guides future development and redevelopment that concentrates along these major streets and creates a town center neighborhood, rather than just a Main Street.

3. The street hierarchy is evident within the TCC district, which includes all three types of streets. These street types are complemented with frontage types that create a hierarchy of smoothly transitioning street/building spatial relationships.

4. Redevelopment in the TCC district provides an opportunity to build new streets that provide the much-needed connection across Holden Street. This increased connectivity supports multiple modes of transportation.

5. The TCC district accommodates most diversity of uses and building forms. This allows for more modern types of development, larger buildings, a wider range of styles, and a use mix that supports a thriving town center.

Table 2.02. Town Center Core District:

Permitted Uses by Building Type and Floor Designation

Use	*Building Type*			
	General	**Limited Bay**	**Row**	**Civic**
Residential and Lodging	G+U	G+U	G+U	N
Civic	G+U	N	N	G+U
Retail	G	G	G+U	N
Service	G	G+U	G+U	N
Office and Industrial	G+U	G+U	G+U	N
G+U = Ground and Upper Floors	N = Not Permitted			
G = Ground Floor Only	U = Upper Floors Only			

(Ord. 2024-28 § 1 (Att. A); Ord. 2020-04 § 1 (Att. A (part)))

17-7-11.3 Uses.

Some uses have additional standards included in Chapter 17-6, Supplementary Regulations.

A. *General Requirements.*

1. *General Provisions.*

a. The following provisions apply to the uses outlined in this section:

i. *Permitted Mixed Uses.* Individual buildings may contain more than one use. Use can vary between ground and upper floors of a building.

ii. *Form District Permissions.* Within each form district, each use is either permitted by right (with some uses limited to upper floors only) or is not permitted.

iii. *Building Type Permissions.* Each use shall be located within a permitted building type on a permitted floor.

iv. *Indoor/Outdoor.* Each use may have both indoor and outdoor facilities, unless otherwise specified.

2. *Organization.*

a. Uses are grouped into general categories and subcategories. See Table 3.01. If a proposed use is not listed in the use tables, the following shall apply:

i. *Unlisted Similar Use.* If a use is not listed but is similar in nature and impact to a use permitted within a form district, the city may interpret the use as permitted. The unlisted use will be subject to any development standards applicable to the similar permitted use.

ii. *Unlisted Dissimilar Use.* If a use is not listed and cannot be interpreted as similar in nature and impact to a use within a form district that is permitted, the use is not permitted and may only be approved through an amendment of this code.

3. *Use Table.*

a. Table 3.01 outlines the uses in each form district as permitted by one of the following designations:

i. *Permitted.* These uses are permitted by right and indicated with a “P” in the table.

ii. *Permitted in Upper Stories Only.* These uses are permitted, by right, but only in upper stories of a building, i.e., not in the ground floor. They are indicated with a “U” in the table.

iii. *Not Permitted.* These uses are not permitted and are indicated by a “N” in the table.

Table 3.01. Use by Form District

Use Category	Form District	
	MS	TCC
Residential and Lodging		
Residential	P	P
Hotel and Inn	P	P
Residential Care	N	U
Civic and Institutional		
Assembly (Public and Private)	P	P
Transit Station	P	P
Medical/Dental Clinic	P	P
Library/Museum/Post Office	P	P
Police and Fire	N	P
School	U	U
Retail		
General Retail	P	P

Use Category	Form District	
	MS	TCC
Neighborhood Retail	P	P
Drive-Through	N	N
Itinerant Merchants	P	P
Service		
General Service	P	P
Neighborhood Service	P	P
Office and Industrial		
Office/Professional	U	U
Craftsman/Industrial	N	P
Accessory Uses		
Home Occupation	P	P
Attached Parking Structure	P	P
Storage Building/Carport	P	P
Site Uses		

Deleted: P

Use Category	Form District	
	MS	TCC
Utility/Infrastructure	P	P
Parking Lot	P	P
Detached Parking Structure	P	P
Open Space	P	P
Telecommunications Facility	P	P

B. *Specific Use Provisions.*

1. *Itinerant Merchants.*

a. *General Requirements.* The city shall not issue a business license for an itinerant merchant unless the following general and applicable specific criteria are demonstrated as part of the business license application:

i. *Location on Private Property.* The business and any activity associated therewith must be located on private property and only as a secondary use to another primary commercial use. The business shall not be located on public property (including public sidewalks, public streets, public parking areas or other public places as defined by the city) or on vacant or residentially used property.

ii. *Impervious Surface.* The business must be located on a hard surface with no portion of the business located in a landscaped or unimproved area.

iii. *Setbacks.* The business must be located a minimum of five feet from combustible walls, roof eave lines, awnings, etc.; ten feet from any building openings (i.e., doors, windows, vents, etc.); and five feet from any fire hydrant,

driveway, handicapped parking space and loading area. Space for queuing shall be provided on private property.

iv. *Lease.* There must be a valid lease or written permission from the private property owner expressly allowing the use of property for the business that is the subject of this section. The merchant shall demonstrate the ability to utilize an existing restroom facility on or nearby the property.

v. *Traffic Safety.* The business location shall not impede auto and/or pedestrian traffic or create auto/pedestrian conflicts. Private sidewalk clear widths shall not be reduced below five feet and the itinerant business shall not interfere with the internal parking lot circulation.

vi. *Power.* All electrical wiring must be in compliance with the National Electrical Code and approved by the Midvale City building department. Extension cords and generators are prohibited.

vii. *Temporary Only.* All aspects of the business shall be temporary in nature with no permanent facilities constructed on site, with the exception of the required permanent power source.

viii. *Maintenance.* The area around the business shall be kept clean and orderly. A trash receptacle shall be provided for patrons. The merchant is responsible to clean up all trash, litter, spills, etc., within a minimum twenty-foot radius of the business.

ix. *Business Conduct.* The business may not solicit or conduct business with persons in motor vehicles or use any flashing lights, noise, sound or other motion-producing devices to attract attention to its operation.

x. *Regulatory Compliance.* All applicable local and state regulations (i.e., food permit, tax numbers, registration, etc.) shall be met.

xi. *Site Plan.* A site plan, drawn to scale, showing the exact location of the itinerant merchant (including all components of the business) with setbacks to buildings, sidewalks, roadways, driveways, parking, fire hydrants, and other important features shall be provided. A photograph or illustration showing components of the business, including cart and awning dimensions, trash receptacles, coolers,

signage, electrical plans, etc., shall be provided, as well as other information required to show compliance with the applicable requirements contained herein.

b. *Specific Requirements.*

i. Each business license application for a vending cart must comply with the following:

(A) There shall be a minimum separation of two hundred feet between all vending cart locations. This separation shall be measured as a radius in all directions, with the vending cart location being the center point.

(B) The vending cart must be located no closer than thirty feet from a single family residential zone.

(C) Any vending cart selling food items shall not be located within two hundred feet of the primary public entrance of an existing restaurant use except that an existing restaurant is allowed to operate a vending cart within this area, provided all other provisions of this section are satisfied.

(D) The vending cart shall be constructed of surface materials that are primarily stainless steel and in accordance with the Salt Lake Valley health department regulations. Transparent, plastic sides may be extended above the cart's preparation/counter surface, provided these sides do not extend beyond the width or length of the cart and three feet above the preparation counter/surface, if it is kept clean, and is free of signage and other attachments. The vending cart shall not exceed a width of four feet and a length of six feet (a hitch may extend a maximum of two feet beyond the length of the cart). The maximum height of the vending cart, excluding canopies or umbrellas, shall be five feet. A vending cart may include a built-in canopy, provided it does not extend more than three feet beyond the width of the cart on each side and any extension beyond the cart width is a minimum of seven feet above the parking lot surface. This canopy shall be an earth tone color or be finished stainless steel.

(E) The vendor shall be limited to three stacked coolers (the footprint of each cooler shall not exceed three and three-quarters square feet in size), one trash

receptacle, one chair, and a freestanding umbrella (not to exceed a six-foot diameter) external to the vending cart. All other freestanding devices, i.e., signs, propane tanks, tables, racks, customer seating, overhead structures (i.e., tarps, enclosures, canopy extensions), etc., are prohibited. The freestanding umbrella shall be an earthtone color, and, if extending beyond the front and side edges of the cart, must be a minimum of seven feet above the ground surface.

(F) Signage shall be attached to the vending cart and occupy no more than four square feet on the street-facing side of the cart. Signs shall not be internally illuminated or make use of flashing or intermittent lighting or animation devices. Pennants, streamers, lawn banners and other temporary signs are prohibited.

(G) A portable fire extinguisher, Type 2A-10 BC minimum, must be mounted within easy reach on the vending cart.

(H) All aspects of the business shall be moved on and off the premises each day of operation. No overnight parking or outdoor storage is allowed. Any vending cart selling food items must be cleaned and stored at a commissary approved by the Salt Lake Valley health department.

(I) The vending cart and all related business items shall be maintained in good condition and repair at all times.

(J) The business shall be conducted only between the hours of six a.m. and ten p.m.

2. *Medical Cannabis.*

a. *Proximity Restrictions.* A medical cannabis pharmacy use shall meet the proximity requirements as specified and amended in Utah Code Annotated Section 26-61a-301.

b. *Application Requirements.* An applicant for a medical cannabis pharmacy use must provide a description of the physical characteristics of the proposed facility, including a site plan, floor plan, architectural elevations, and a security plan as part of the business license application for the use. Fencing and security devices must comply with applicable city requirements.

c. *Signage.* In addition to those requirements within this title, all signage associated with a medical cannabis pharmacy use shall comply with any requirements imposed by the state of Utah.

3. *Retail Tobacco Specialty Business.*

a. *Proximity Restrictions.* A retail tobacco specialty business use shall meet the proximity requirements as specified and amended in Utah Code Annotated Section 10-8-41.6.

4. *Outdoor Dining.* Each application for an outdoor dining use shall comply with the following:

a. The dining area shall be located on private property or leased public property and shall not diminish required parking or landscaping.

b. The dining area shall not impede pedestrian circulation.

c. The dining area shall not impede emergency access or circulation.

d. The outdoor furnishings shall be compatible with the streetscape and associated building.

e. No music or noise shall be in excess of the city noise ordinance. No outdoor music shall be allowed after 10:30 p.m.

f. No part of the outdoor dining area shall be located within twenty feet of any residential zone (measured from the edge of the outdoor dining area to the closest boundary of the residential zone).

g. Cooking facilities shall be located within the primary building. Cooking utilities, including grills and smokers, are permitted for use in outdoor dining areas.

h. The outdoor dining area shall be kept in a clean condition and free of litter and food items which constitute a nuisance to public health, safety and welfare.

5. *Pawn Shops.*

a. Display areas are limited to those shown on the approved site plan and may not exceed a combined one hundred square feet in size.

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6. *Telecommunications Facility.* Telecommunications facilities shall be wall- or roof-mounted and shall comply with the following:

a. *Wall-Mounted Antenna.*

i. Antennas mounted directly on existing parapet walls, penthouses, or mechanical equipment rooms are considered a wall-mounted antenna if no portion of the antenna extends above the roofline of the building or extends no more than four feet horizontally from the face of the building. Whip antennas are not allowed on a wall-mounted antenna structure.

ii. Antennas, equipment, and the supporting structures shall be selected to achieve architectural compatibility with the host structure to which they are attached.

iii. Two types of wall-mounted antennas are allowed: stealth-mounted and non-stealth-mounted.

(A) Stealth facilities shall be designed to substantially conceal and camouflage the antennas and associated equipment.

(1) The planning commission shall review and may grant approval for any new antenna(s) that require construction of a new screening wall. New screening wall(s) shall be in harmony with the structure's mass, architectural features, and overall aesthetics. Architectural and structural renderings, three-dimensional representation, line-of-sight diagrams, photo simulations, and/or building elevations of the proposed modifications may be required to effectively demonstrate the requested changes meeting the intent of this chapter.

(2) *Area Limitations for Stealth Wall-Mounted Antennas.* The total area for all stealth wall-mounted antennas and supporting structures combined shall not exceed five percent of any exterior wall of the building. Stealth wall-mounted antennas may occupy a maximum of four walls. The total calculated area is the sum of each individual antenna and the visible portion of the supporting structure as viewed when looking directly at the face of the building.

(B) Non-stealth facilities shall only be considered in locations in which adverse visual impacts are not a substantial concern due to the location of the facility, the nature of the surrounding land uses, and not visible from public vantage points.

(1) *Area Limitations for Non-Stealth Wall-Mounted Antennas.* The total area for all non-stealth wall-mounted antennas and supporting structures combined shall not exceed forty square feet for each exterior wall of the building or a total of one hundred sixty square feet per building. The total calculated area is the sum of each individual antenna and the visible portion of the supporting structure as viewed when looking directly at the face of the building.

b. *Roof-Mounted Antenna.*

i. Antennas, equipment, and the supporting structures shall be selected to achieve architectural compatibility with the host structure to which they are attached.

ii. Roof-mounted antennas are an allowed use only on a flat roof and shall be screened, constructed and painted to match the structure to which they are attached. The planning commission shall review and may grant approval to place roof-mounted stealth antennas on a pitched roof if the antenna(s) are compatible with the existing structure. Roof-mounted antennas may be mounted on existing penthouses or mechanical equipment rooms if the antennas and antenna support structures are enclosed or visually screened from view.

iii. Two types of roof-mounted antennas are allowed: stealth-mounted and non-stealth-mounted.

(A) Stealth facilities shall be designed to substantially conceal and camouflage the antennas and associated equipment.

(1) Antennas shall be mounted at least five feet behind any parapet wall or from the exterior wall of the building. The maximum height of an antenna mounted between five and ten feet behind a parapet or exterior wall shall be directly proportional to the setback distance and may not

exceed a height of ten feet above the top of the parapet wall or roofline of the building.

(2) The planning commission shall review and may grant approval for any new antenna(s) that require construction of a new screening wall. New screening wall(s) shall be in harmony with the structure's mass, architectural features, and overall aesthetics. Architectural and structural renderings, three-dimensional representation, line-of-sight diagrams, photo simulations, and/or building elevations of the proposed modifications may be required to effectively demonstrate the requested changes meeting the intent of this chapter.

(B) Non-stealth facilities shall only be considered in locations in which adverse visual impacts are not a substantial concern due to the location of the facility and the nature of the surrounding land uses.

7. *Reserved.*

8. *Fire Station.* Due to their unique operational requirements, fire stations may:

a. Have garage doors located on the front facade.

b. Have wider driveway widths than the maximum allowed by frontage type.

c. Have visitor parking areas within the front yard and required parking setback areas; provided, all parking-related landscape requirements are satisfied.

d. Be located outside of the build-to zone and corner occupation requirements, including the corner occupation requirement for primary facade courtyards.

e. Be exempted from frontage coverage requirements.

f. Use equipment storage garages to meet occupied depth requirements.

g. Be shorter than the required minimum building height.

h. Install turf grass along one side of vehicle access points between the nearest building elevation and the property line.

9. *Police Station.* Due to their unique operational requirements, police stations may:

a. Have garage doors located on the front facade.

b. Have wider driveway widths than the maximum allowed by frontage type.

c. Have visitor parking areas within the front yard and required parking setback areas; provided, all parking-related landscape requirements are satisfied.

10. *Internal Accessory Dwelling Unit.*

a. An IADU may only be constructed on a lot with one detached single family dwelling. The property owner must occupy one of the dwelling units on the property as their permanent residence for as long as the IADU remains on the property.

b. The IADU must conform to all applicable standards in the building, plumbing, electrical, mechanical, fire, health, and any other applicable codes. A building permit is required prior to engaging in any construction activity on an IADU.

c. Installing separate utility meters or separate addresses for an IADU is prohibited.

d. Any additions to an existing building must comply with the development standards within this chapter.

e. An IADU must provide off-street parking as described within this chapter.

f. An IADU may not be constructed within a mobile home or manufactured home.

g. An IADU may not be constructed on a lot with a total square footage of six thousand or less.

h. Prior to issuance of a certificate of occupancy for an IADU, the property owner must record a notice against the property's title that includes:

i. A description of the primary dwelling;

ii. A statement that the property contains an IADU; and

iii. A statement that the IADU may only be used in accordance with this title.

i. An IADU may not be rented or leased for a period of less than thirty consecutive days.

j. Only one IADU is permitted on each property.

C. *Prohibited Uses.* Except for existing legal nonconforming uses, the following uses are prohibited throughout all form districts:

1. Sexually oriented businesses;

2. Auto-related uses;

3. Medical cannabis production establishment;

4. Outdoor storage. (Ord. 2024-27 § 1 (Att. A); Ord. 2024-19 § 1 (Att. A); Ord. 2021-19 § 1 (Att. A); Ord. 2021-08 § 1 (Att. A); Ord. 2020-04 § 1 (Att. A (part)))

17-7-11.4 Street types.

A. *General Requirements.*

1. *Intent.* The standards outlined in this section are intended to:

a. Create complete streets that address all modes of travel, including pedestrian traffic, bicycle traffic, transit, and vehicular traffic;

b. Address all features of the street right-of-way, including sidewalks, parkways, traffic lanes, bicycle lanes, and medians;

c. Extend, where applicable, the existing logical and comprehensible system of streets and street names that result in a simple, consistent and understandable pattern of blocks, lots, and house numbers;

d. Provide adequate access to all lots for vehicles and pedestrians;

e. Create streets that are appropriate for their context in each of the form districts and are designed to encourage travel at appropriate volumes and speeds; and

f. Create streets and public rights-of-way that aid in the safe and efficient management of stormwater runoff.

2. *Applicability.* The standards in this section apply to all vehicular rights-of-way within the Main Street FBC area. The majority of implementation activities will occur when an existing street is rebuilt or a new street is built.

3. *General Requirements.*

a. All proposed streets, landscape or furnishings zones, and sidewalks shall be located in dedicated vehicular rights-of-way.

b. All new vehicular rights-of-way shall match one of the street types as described in subsections (D) through (F) of this section, whether publicly dedicated or privately held.

c. All streets shall be available for public use at all times, except when closed by the city. Gated streets and streets posted as private are not permitted except when closed by the city.

4. *Street Construction Specifications.* All construction in the right-of-way shall follow specifications defined by the city. The street standards within this section are intended to be minimum requirements. The city may use alternative designs when reconstructing streets, provided the general intent of street construction specifications of the neighborhood is maintained.

B. *General Street Type Standards.*

1. *Street Types.*

a. Street types defined in this section outline the acceptable street configurations for the FBC district.

b. The street type map for the Main Street FBC district is shown in Figure 4.01. Solid lines indicate existing streets and dotted lines indicate potential new streets.

c. Street type configurations are to be implemented when reconstructing existing streets or building new streets.

i. The city may require changes to the right-of-way, pavement width, or additional street elements depending on unique site characteristics.

ii. The city may permit modifications to street widths and required improvements. Any modifications shall be approved by the community development director in consultation with the city engineer, public works director, and fire marshal.

iii. The potential new streets provide the critical connectivity and realign existing streets for increased connectivity and efficiency. These potential streets are not formally proposed but illustrate how future streets can meet the connectivity and access needs of future developments, regardless of when those developments occur.

d. The hierarchy of street types, from the most major to the most minor street type is:

i. Main Street;

ii. Major commercial street;

iii. Minor commercial street.

Figure 4.01. Street Type Map

2. *Graphics.* The graphics in this chapter are samples of recommendations that illustrate a configuration of each street type. Exact cross-sections are subject to city review and approval. Examples in this chapter are drawn in detail for clarification purposes only. When applying the described standards to actual streets, other configurations are possible.

3. *Typical Street Elements.* Typical elements of a right-of-way are divided into vehicular and pedestrian realms. Generally, the vehicular realm will be designed and controlled by the

city. The pedestrian realm will be designed and improved by property owners, in coordination with the city.

a. The vehicular realm is the space between the curbs on both sides of a street. It is comprised of travel lanes, parking lanes, turn lanes, transit stopping areas, bike lanes, and medians.

b. The pedestrian realm is the space between the back of a street curb and the property line of the adjacent parcel. It is subdivided into two spaces, the park strip and the sidewalk. The sidewalk is the paved area along the edge of the right-of-way. Sidewalks are designed for the movement of pedestrian traffic along the street and pedestrian access to buildings. The park strip is the space between the sidewalk and the curb. It acts as a buffer area between the sidewalk and street. Park strips can be used in two different ways, described as two-use zones, the landscape zone and furnishings zone. These two-use zones are intermixed along each street based on the street type requirements.

i. The landscape zone is where the park strip is unpaved and landscaped with ornamental plants, mulch, and/or street trees. It may also include swales, lighting, public art, and signage.

ii. The furnishings zone is a paved portion of the park strip. It is designed for the pedestrian uses that would block the movement of pedestrian traffic in the sidewalk, such as sitting and gathering. Furnishings zones may include street trees in grates, street furniture, lighting, signage, bicycle parking, bollards, public art, and transit stops.

4. *Vehicular Travel Lanes.* The number and width of vehicular travel lanes, parking lanes, and bike lanes are determined by the street type.

5. *Bicycle Lanes.* The following types of bicycle accommodations are permitted in the vehicular zone per street type standards:

a. "Dedicated bicycle lanes" are striped lanes on the outside of the outermost travel lane and are designated for bicycle use only. This lane typically occurs on both sides of the street and shall be five feet wide. The width of any adjacent gutters shall not be included in the bike lane width.

b. "Marked shared lanes" are shared by both vehicular and bicycle traffic and are indicated by the shared arrow or "sharrow" symbol, a directional arrow painted on the pavement. Marked shared lanes are typically wider than a standard vehicular travel lane and should be a minimum of thirteen feet wide.

c. "Unmarked shared lanes" refers to streets without any marked bicycle lanes that have traffic speeds and enough space for cyclists to safely ride along. Without designations, markings, or signage, these are essentially determined by each individual cyclist, are unregulated, and are not actual "lanes."

6. *Transportation Facilities.* Transportation facilities include those for public transit and delivery trucks.

a. Public transit facilities should be included at each bus stop and TRAX station according to the following criteria:

i. Public transit facilities are located in the furnishings zone of the park strip and may include loading areas, landings, ramps, transit shelters, benches, lighting, pedestrian clear zones, and all other reasonable accommodations.

ii. All public transit facilities shall be coordinated with the UTA.

b. Truck loading spaces (TLS) provide on-street short-term loading spaces for delivery trucks to prevent them from parking in travel lanes and pedestrian areas.

i. Each TLS must be located in and fit within the width of an on-street parking lane. Street types without on-street parking lanes shall not have any TLSs.

ii. TLS pavement markings should clearly define the size of the TLS and be adequate to accommodate the length of a typical delivery vehicle. This may require a longer space than the standard on-street parking space.

iii. Signage at each TLS shall clearly post the maximum time that a delivery vehicle may occupy the space and the times of day and days of the week when the TLS is reserved for delivery vehicle loading activities. The sign should also indicate that regular on-street parking is allowed during non-loading times.

iv. The number and location of each TLS should be determined by city staff and based on the demand for loading space adjacent to existing buildings and uses.

The specific location of each TLS shall be indicated on the street and/or streetscape plans for each street.

7. *On-Street Parking.* On-street parking requirements and permissions are determined by street type.

8. *Streetscape Landscaping.*

a. Streetscape designs shall be prepared for each street as part of a new or reconstructed street.

i. Streetscape design plans shall be prepared by a landscape professional such as a landscape architect or certified landscape designer.

ii. Whether a proposed development includes one or both sides of the street, streetscape plans must provide a consistent streetscape along the length of the street.

iii. Streetscape plans shall meet the requirements in the pedestrian realm section of the applicable street type requirements table.

(A) The streetscape plan shall define the size and spacing of the landscape and furnishings zones.

(B) Planting plans shall be included for all landscape zones and planted medians.

b. Street trees are required along all street fronts.

i. Street trees shall be located in the park strip or bulb-out.

(A) In furnishings zones, trees shall be located in tree wells, covered by tree grates, and planted in either structural soil or soil cells.

(B) In landscape zones, trees shall be planted with the ground plane vegetation.

ii. Street trees shall be regularly spaced at thirty feet on center and, where possible, coordinated with the location of light poles and utility poles in order to maintain consistent street tree spacing.

iii. The community development director may approve a modification to street tree location if the thirty-foot requirement impedes building facade visibility.

9. *Stormwater Management.* Incorporating stormwater management best practices is encouraged. Park strip features that help with stormwater management include drainage swales and slotted curbs in the landscape zones and permeable pavement in the furnishings zones. Stormwater management structures shall be approved by the city engineer.

10. *Fire Access.*

a. *Street configurations have been calculated to provide emergency vehicle access.* On streets where the total width of all travel lanes is narrower than twenty feet, the following shall apply:

i. Passing areas shall be provided at one hundred twenty-foot intervals where a thirty-foot opening in the on-street parking or a thirty-foot dedicated pullout space is provided for vehicles to pull over to allow a fire truck to pass.

ii. A driveway curb cut or fire hydrant zone may be utilized to fulfill the pull over requirement.

C. *General Street Layout Requirements.*

1. *General Layout Standards.* The following standards apply to new streets, reconstructed streets, or newly platted vehicular rights-of-way:

a. Streets shall be designed to respect natural features, such as slopes, by following rather than being interrupted by or dead-ending at the feature.

b. The street network shall form an interconnected pattern with multiple intersections.

c. The arrangement of new or reconstructed streets shall provide for the continuation of existing streets from adjoining areas into new subdivisions.

2. *Intersections.*

a. Curb radii at intersections should be designed for the actual turning radius of the typical design vehicle, not the maximum design vehicle. The curb radius used at each intersection is determined by intersection type as shown in

Table 4.01. The following curb radii shall be used unless otherwise required/ authorized by the city:

i. Small radii are required at intersection Type 1. See Table 4.01.

(A) Intersections with on-street parking on both streets shall have a five-foot curb radius.

(B) Intersections with on-street parking on one or neither of the streets shall have a fifteen-foot curb radius.

ii. Medium radii are required at intersection Types 2 through 5. See Table 4.01.

(A) Intersections with on-street parking on both streets shall have a ten-foot curb radius.

(B) Intersections with on-street parking on one or neither of the streets shall have a twenty-five-foot curb radius.

iii. Larger radii require special approval from the city and are limited to streets without on-street parking and intersections where a street must meet the design criteria for large vehicles.

Table 4.01. Curb Radius Intersection Types

Small Radius Intersections		
Intersection Type	Intersecting Street Types	
Type 1	Minor Commercial Street	Minor Commercial Street
Medium Radius Intersections		

Intersection Type	Intersecting Street Types	
Type 2	Major Commercial Street	Major Commercial Street
Type 3	Major Commercial Street	Main Street
Type 4	Major Commercial Street	Minor Commercial Street
Type 5	Main Street	Minor Commercial Street

b. Marked crosswalks are required at all intersections and mid-block pedestrian crossings.

i. Crosswalk marking type shall be determined by the community development director.

ii. Crosswalk widths shall be a minimum of six feet.

iii. Crosswalk markings shall be clearly located on the finished street surface and where required in parking and access areas. Crosswalks shall be marked with textured or colored pavement, thermoplastic applications, or another marking approved by the city.

iv. Crosswalks with creative markings are allowed as a form of public art, with approval from the city.

v. Crosswalk length shall encourage pedestrian activity. The required bulb-outs decrease unprotected crosswalk lengths which increases pedestrian safety and comfort.

vi. Accessibility features such as ramps and warning panels, per the Americans with Disabilities Act or any more stringent state or local requirement, are required where all sidewalks terminate at a crosswalk or curb.

vii. Ramps shall be oriented perpendicular to traffic, requiring two ramps per corner at intersecting streets.

c. Bulb-outs shall be constructed at all intersections and mid-block crossings unless prohibited by the city.

i. The depth of the bulb-out shall match the depth of the adjacent on-street parking lane (if any).

ii. The radius of each bulb-out shall match the radius requirements for each intersection type. See Table 4.01.

iii. Bulb-outs shall be planted with low-maintenance water-efficient live plants, which may include trees, that have a low mature height to provide unobstructed safety sight lines without requiring constant pruning.

3. *Street Lighting.*

a. *Intent.*

i. To provide a safe and secure environment for motorists, bicyclists, and pedestrians;

ii. To reduce glare from street and pedestrian lights on adjoining residences;

iii. To contribute to the quality of each streetscape by integrating streetlight spacing and street tree spacing;

iv. To respond to and further neighborhood character through the selection of light poles, bases, and fixtures appropriate to the commercial, residential or civic nature of surrounding uses; and

v. To select consistent light poles, fixtures, lamp types, finishes and colors for all pedestrian and streetlights.

b. *Street Lighting Standards.*

i. Unless otherwise required by the city, all new streetlights shall comply with the following street lighting standards:

(A) Light sources shall be at least as efficient as LED and no greater than 4,000K in correlated color temperature (CCT).

(B) Light fixtures shall use a cut-off luminaire that is fully or partially shielded with no light distributed above the horizontal plane of the luminaire or into nearby residential structures.

(C) Light fixtures shall use a cut-off luminaire that is fully or partially shielded with no light distributed above the horizontal plane of the luminaire or into nearby residential structures.

(D) Streetlights shall be placed at intersections and at a frequency no less than one streetlight per every one hundred fifty feet of roadway, rounded up to the next whole number. Streetlight locations shall alternate sides of the street to the greatest extent possible.

(E) Poles and fixtures shall be black, dark brown, or another neutral color approved by the city.

ii. The community development director may exempt a street from these requirements if implementing a thematic design which incorporates lighting and fulfills the intent.

D. *Main Street.*

1. *Intent.*

a. *This special street type maintains the historic configuration of Main Street.* This configuration includes the narrow right-of-way, lower traffic speed, wide pedestrian realm, on-street parking, and streetlights.

b. This street type also includes elements that were not part of the original historic Main Street streetscape. Some of these elements are currently installed along portions of the street and include street trees, street furnishings, and ornamental plantings. These elements create a more pedestrian-oriented street and help set Main Street apart as a special street within the neighborhood and city.

2. *General Requirements.*

a. Main Street shall be newly constructed or reconstructed, in whole or in part, according to the standards in Table 4.02 and Figures 4.02 and 4.03. Measurements shown in these standards may need to be adjusted to actual dimensions on the

ground. The installation of new streetscape elements shall emulate and provide continuity with the streetscape elements already installed on the southern blocks of Main Street.

3. *Applicability.*

a. This street type only applies to the section of Main Street from Center Street to 7th Avenue as indicated on the street type map, Figure 4.01. As Main Street is currently fully constructed, these requirements shall be implemented at any future street reconstruction.

Table 4.02. Main Street Requirements

Vehicular Realm		
Typical Right-of-Way		68'
Travel Lanes		2 lanes, 10.5' wide, striped
Center Lane	Median	None
	Left Turn	None
On-Street Parking		8' wide lane, striped on both sides of the street
Bicycle Lane		Sharrow-marked shared bike lane (13' min. width)
Truck Loading Space		Required – size and location(s) to be determined by community development director and/or streetscape plan

Bulb-Outs		Required at all intersections and mid-block crossings
Pedestrian Realm		
Sidewalk		9' sidewalk on both sides of the street
Park Strip	Width	4' park strip on both sides of the street
	Street Trees	Evenly spaced at 30' on center
	Streetlights	Evenly spaced to achieve desired light coverage and per fixture manufacturer's guidelines; streetlight spacing should be coordinated with street trees where possible
	Landscape Zone	**Required:** at-grade planters, street trees located in planters, water-efficient low-maintenance ornamental plants, streetlights, no lawn
		As Needed: street signage, utilities, public art, bollards
	Furnishings Zone	**Required:** trees in tree wells with grates, seating, bike rack, garbage can, lighting
		As Needed: street signage,

		utilities, public art, bollards
	Zone Spacing	The Main Street park strips are predominantly furnishings zones with landscape zones limited to all bump-outs. The frequency/spacing of furnishings, trees, and streetlights are to be defined in a streetscape plan.

Figure 4.02. Main Street Typical Section

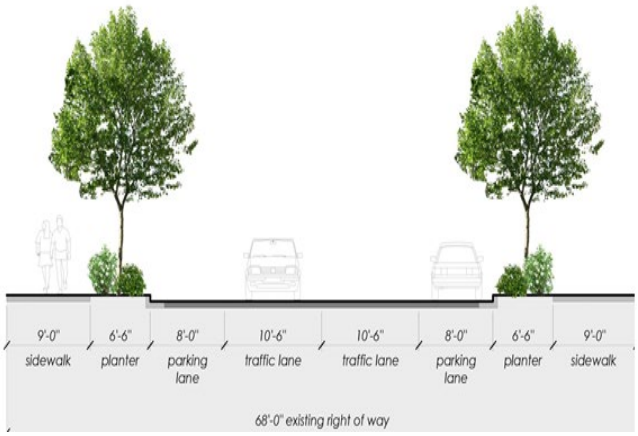


Figure 4.03. Main Street Rendering

E. *Major Commercial Street.*

1. *Intent.*

   a. This is the highest order street type and accommodates the larger flows of pedestrians, cyclists, and vehicles along the neighborhood's most major streets. These are the streets that connect the Main Street neighborhood to the surrounding areas.

2. *General Requirements.*

   a. Major commercial streets shall be newly constructed or reconstructed, in whole or in part, according to the standards in Table 4.03 and Figures 4.04 and 4.05. Measurements shown in these standards may need to be adjusted to actual dimensions on the ground. If right-of-way widths vary from the typical value, the pedestrian realm should be adjusted to absorb the surplus or deficit width.

3. *Applicability.*

   a. This street type applies only to the sections of Center Street and Holden Street/700 West as indicated in the street type map in Figure 4.01. These requirements shall be implemented with any future street redevelopment or reconstruction and, where incomplete sections exist, with the development projects on adjacent parcels.

b. Existing major commercial streets may have different right-of-way widths. This typical street section may need to be adjusted. Adjustments priorities are:

i. Remove one parking lane.

ii. Reduce sidewalk/buffer area to nine feet minimum.

Table 4.03. Major Commercial Street Requirements

Vehicular Realm		
Typical Right-of-Way		~100'
Travel Lanes		4 lanes, 10.5' wide, striped
Center Lane	Median	11' wide raised planter with trees
	Left Turn	11' wide, striped
On-Street Parking		8' wide lane, striped on both sides of the street
Bicycle Lane		5' unprotected lane on both sides of street
Truck Loading Space		Required – size and location(s) to be determined by community development director and/or streetscape plan
Bulb-Outs		Required at all intersections and mid-block crossings

Pedestrian Realm		
Sidewalk		7' sidewalk on both sides of the street
Park Strip	Width	3.5' park strip on both sides of the street
	Street Trees	Evenly spaced at 30' on center
	Streetlights	Evenly spaced to achieve desired light coverage and per fixture manufacturer's guidelines; streetlight spacing should be coordinated with street trees where possible
	Landscape Zone	**Required:** at-grade planters, street trees located in planters, water-efficient low-maintenance ornamental plants, streetlights, no lawn
		As Needed: street signage, utilities, public art, bollards
	Furnishings Zone	**Required:** trees in tree wells with grates, seating, bike rack, garbage can, lighting
		As Needed: street signage, utilities, public art, bollards
	Zone Spacing	Major commercial street park strips are a mix of landscape

		and furnishings zones. The configuration of zones and frequency/spacing of furnishings, trees, and streetlights are to be defined in a streetscape plan.

Figure 4.04. Major Commercial Street Typical Section

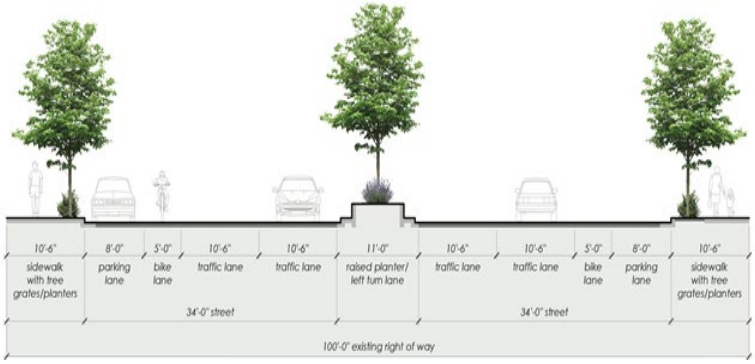


Figure 4.05. Major Commercial Street Rendering

F. *Minor Commercial Street.*

1. *Intent.*

a. Minor commercial streets are the intermediate order street type that provide the interstitial connections between the higher order and lower order street types. They provide most of the neighborhood's internal connections.

2. *General Requirements.*

a. Minor commercial streets shall be newly constructed or reconstructed, in whole or in part, according to the standards in Table 4.04 and Figures 4.06 and 4.07. Measurements shown in these standards may need to be adjusted to actual dimensions on the ground.

3. *Applicability.*

a. This street type applies only to the minor commercial streets as indicated in the street type map, Figure 4.01. These requirements shall be implemented with any

future street redevelopment or reconstruction and, where incomplete sections exist, with the development projects on adjacent parcels.

b. Existing minor commercial streets may have different right-of-way widths. This typical street section may need to be adjusted. Adjustments priorities are:

i. Remove one parking lane (on either side) with extra space added to the buffer/sidewalk width.

ii. *Reduce buffer width.* Buffers shall be a minimum width of three feet. Narrower buffer areas become part of the sidewalk width.

iii. *Reduce sidewalk width.* Minimum sidewalk width is four feet.

Table 4.04. Minor Commercial Street Requirements

Vehicular Realm		
Typical Right-of-Way		~50'
Travel Lanes		2 lanes, 10.5' wide, striped
Center Lane	Median	None
	Left Turn	None
On-Street Parking		None (but can be added if right-of-way is widened)
Bicycle Lane		5' unprotected lane on one side of street
Truck Loading Space		Required – size and location(s) to be determined by community development director and/or streetscape

		plan
Bulb-Outs		Required at all intersections and mid-block crossings
Pedestrian Realm		
Sidewalk		6' sidewalk on both sides of the street
Park Strip	Width	5' park strip on both sides of the street
	Street Trees	Evenly spaced at 30' on center
	Streetlights	Evenly spaced to achieve desired light coverage and per fixture manufacturer's guidelines; streetlight spacing should be coordinated with street trees where possible
	Landscape Zone	**Required:** at-grade planters, street trees located in planters, water efficient low-maintenance ornamental plants, streetlights, no lawn
		As Needed: street signage, utilities, public art, bollards
	Furnishings Zone	**Required:** trees in tree wells with grates, seating, bike

		rack, garbage can, lighting
		As Needed: street signage, utilities, public art, bollards
	Zone Spacing	Minor commercial street park strips are primarily landscape zones. The configuration of zones and frequency/spacing of furnishings, trees, and streetlights are to be defined in a streetscape plan.

Figure 4.06. Minor Commercial Street Typical Section

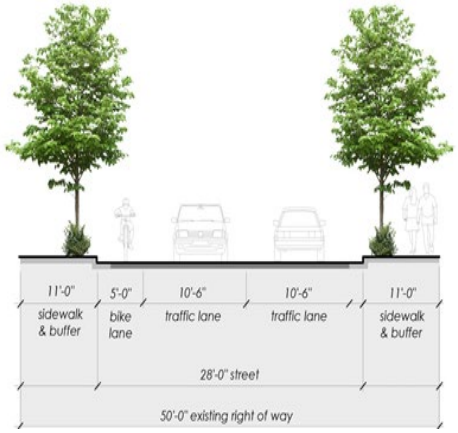
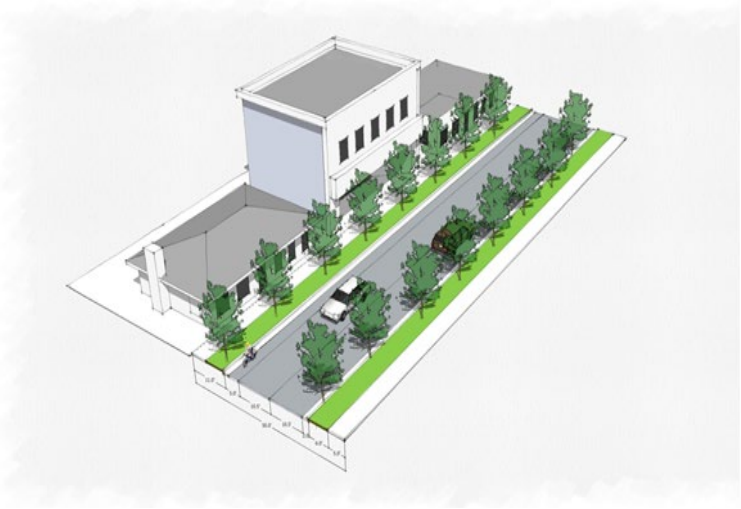


Figure 4.07. Minor Commercial Street Rendering



(Ord. 2024-28 § 1 (Att. A); Ord. 2020-04 § 1 (Att. A (part)))

17-7-11.5 Frontages.

A. *General Requirements.*

1. *Intent.*

a. The frontage requirements outlined in this section define the interface between the public and private realms. This interface occurs at the line where each land parcel abuts a public right-of-way, referred to as the frontage, and is a continuous feature along both sides of each street. Building facades are a major component of this public/private interface, so building type is constrained by frontage type.

2. *Frontage Types.*

a. Three different frontage types are defined and applied to specific streets, as shown in the frontage map, Figure 5.01. Multiple types are used to create a town center neighborhood with a variety of street/frontage combinations. These combinations reinforce the street hierarchy based on each street's connectivity, function, capacity, and its role in creating a walkable, vibrant town center.

b. The three frontage types are: primary, secondary, and tertiary. Primary frontages are applied to the major roads, including Main Street and the major through roads. Secondary frontages are applied to the roads that directly connect to the major roads. Tertiary frontages are applied to the most minor streets.

c. The hierarchy of frontage types, in order of priority, is:

i. Primary frontage;

ii. Secondary frontage;

iii. Tertiary frontage.

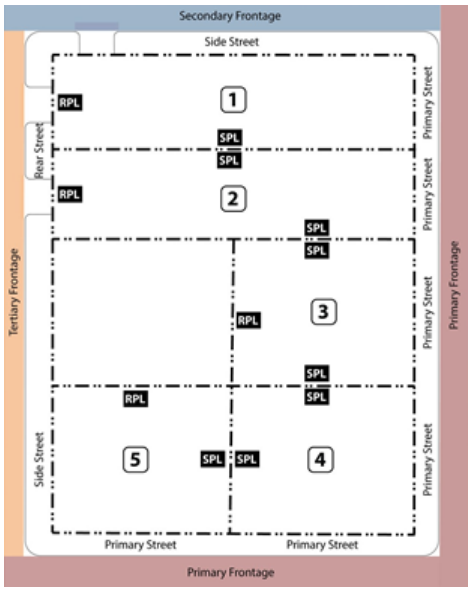
d. If multiple frontages exist on a single parcel, the frontage requirements shall be based on the highest priority frontage affecting the lot.

3. *Frontage Specifications.*

a. Minimum frontage coverage may be reduced to provide for a driveway access when no other frontage is available to be used for access. When frontage coverage is reduced using this provision, the provided driveway shall be limited to the minimum width required for access, as determined by city staff using the minimum width as a standard, and the remaining frontage shall be covered by a building or BTZ pedestrian space, as otherwise allowed within this title.

Figure 5.01. Frontage Map

Figure 5.02. Lot Configuration Types



B. *Primary Frontage.*

1. *Intent.*

a. Primary frontages accommodate more intense development and maintain the town center type of spatial relationships between buildings and streets. Buildings are located very close to the right-of-way, creating a consistent street wall and prioritizing walkability.

b. The values of the various parameters provide less flexibility than the other frontage types. Primary frontages are applied only to the Main Street and major commercial street types.

2. *Design Standards.*

a. Regulations for primary frontages are defined in Table 5.01 and Figures 5.03 and 5.04.

Table 5.01. Primary Frontage Requirements

Building Placement		
	BUILD-TO-ZONE (BTZ)	
1.	Primary Street	0' min – 10' max
2.	Side/Rear Street	0' min – 10' max
	SETBACK	
3.	Side	0' min
4.	Rear	5' min
	FRONTAGE COVERAGE	
5.	Primary Street Facade	80% min
6.	Side Street Facade	50% min
7.	Rear Street Facade	No min
8.	Corner Buildings Primary Street Facade Side Street Facade Rear Street Facade	 30' min 30' min No min
9.	Primary Facade Courtyard	20% max width
Encroachments		

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10.	Primary Street Ground Floor Upper Floor(s)	 12' max 6' max
11.	Side/Rear Street Ground Floor Upper Floor(s)	 8' max 6' max
	Parking (See Section 17-7-11.9)	
	SETBACK	
12.	Primary Street	30' min
13.	Side/Rear Street	5' min
14.	Side	5' min
15.	Rear	5' min
	PARKING DRIVEWAY (surface lot and structure)	
	Minimum Width	15'
16.	Maximum Width Two-Way One-Way	 25' 16'
17.	Corner Lot Location	Side/rear street

18.	Distance from Corner	35' min
19.	Corner Interior Lot Location	Shared driveway, rear street, primary street as a last resort
	BICYCLE AND OFFSITE PARKING	
20.	Bicycle parking to be provided in a secure location	

C. *Secondary Frontage.*

1. *Intent.*

a. *Secondary frontages accommodate medium intensity development.* The purpose is to maintain town center style spatial relationships along streets and also to transition those relationships between the most intense and least intense development areas.

b. The values of the frontage parameters provide more flexibility than the primary frontage, allowing for increased spatial diversity and development styles. Secondary frontages are applied primarily to the minor commercial street type.

2. *Design Standards.*

a. Regulations for secondary frontages are defined in Table 5.02 and Figures 5.03 and 5.04.

Table 5.02. Secondary Frontage Requirements

Building Placement		
	BUILD-TO-ZONE (BTZ)	
1.	Primary Street	0' min – 15' max
2.	Side/Rear Street	0' min – 15' max

	SETBACK	
3.	Side	0' min – 10' max
4.	Rear	5' min – 10' max
	FRONTAGE COVERAGE	
5.	Primary Street Facade	70% min
6.	Side Street Facade	50% min
7.	Rear Street Facade	No min
8.	Corner Buildings Primary Street Facade Side Street Facade Rear Street Facade	 30' min 30' min No min
9.	Primary Facade Courtyard	15% max width
	Encroachments	
10.	Primary Street Ground Floor Upper Floor(s)	 8' max 6' max
11.	Side/Rear Street Ground Floor	 6' max

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	Upper Floor(s)	4' max
Parking (See Section 17-7-11.9)		
	SETBACK	
12.	Primary Street	30' min
13.	Side/Rear Street	5' min
14.	Side	5' min
15.	Rear	5' min
	PARKING DRIVEWAY (surface lot and structure)	
16.	Maximum Width Two-Way One-Way	 25' 16'
17.	Corner Lot Location	Side/rear street
18.	Distance from Corner	35' min
19.	Corner Interior Lot Location	Shared driveway, rear street, primary street as a last resort
	BICYCLE AND OFFSITE PARKING	
20.	Bicycle parking to be provided in a secure location	

D. *Tertiary Frontage.*

1. *Intent.*

   a. *Tertiary frontages accommodate lower intensity development.* The purpose is to provide a spatial transition between the forms within the FBC area and the existing development surrounding the area.

   b. The values of the frontage parameters allow for more flexibility than the other two frontage types. Tertiary frontages are applied primarily to the neighborhood street type.

2. *Design Standards.*

   a. Regulations for tertiary frontages are defined in Table 5.03 and Figures 5.03 and 5.04.

Table 5.03. Tertiary Frontage Requirements

Building Placement		
	BUILD-TO-ZONE (BTZ)	
1.	Primary Street	0' min – 20' max
2.	Side/Rear Street	0' min – 20' max
	SETBACK	
3.	Side	5' min – 10' max
4.	Rear	15' min – 25' max
	FRONTAGE COVERAGE	
5.	Primary Street Facade	50% min

6.	Side Street Facade	40% min
7.	Rear Street Facade	No min
8.	Corner Buildings Primary Street Facade Side Street Facade Rear Street Facade	 30' min 30' min No min
9.	Primary Facade Courtyard	10% max width
	Encroachments	
10.	Primary Street Ground Floor Upper Floor(s)	 4' max 4' max
11.	Side/Rear Street Ground Floor Upper Floor(s)	 4' max 4' max
	Parking (See Section 17-7-11.9)	
	SETBACK	
12.	Primary Street	30' min
13.	Side/Rear Street	5' min

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14.	Side	5' min
15.	Rear	5' min
	PARKING DRIVEWAY (surface lot and structure)	
16.	Maximum Width Two-Way One-Way	 25' 16'
17.	Corner Lot Location	Side/rear street
18.	Distance from Corner	35' min
19.	Corner Interior Lot Location	Shared driveway, rear street, primary street as a last resort
	BICYCLE AND OFFSITE PARKING	
20.	Bicycle parking to be provided in a secure location	

Figure 5.03. Building Placement Example Diagram

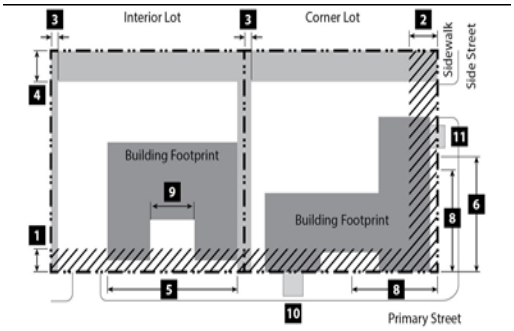
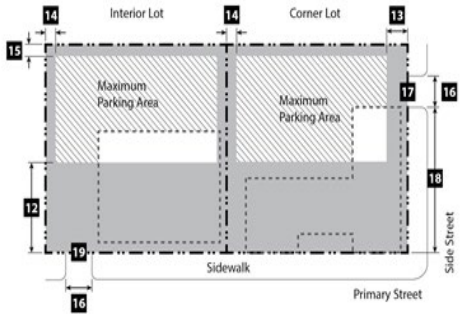


Figure 5.04. Parking Area Placement Example Diagram



(Ord. 2024-28 § 1 (Att. A); Ord. 2020-04 § 1 (Att. A (part)))

17-7-11.6 Building types.

A. *General Requirements.*

1. Buildings are one of the most prominent components of the built environment and collectively define much of the character of a streetscape or neighborhood. Buildings are collections of architectural elements that can be described in terms of both form and style. These building form requirements define the physical forms of the buildings without defining their style. These form requirements are designed to ensure that future building projects meet the goals of the Main Street town center.

2. All building types must meet the following requirements:

a. *Form District.* Each building type shall be built only in the form district(s) where they are explicitly allowed, as shown in the individual building type tables and summarized in Table 6.01.

Table 6.01. Building Type by Form District

Building Type	Form District

	MS	TCC
General	P	P
Limited Bay	N	P
Row	P	P
Civic	P	P

b. *Use.* Each building type can accommodate a variety of uses, as outlined in Section 17-7-11.3. Uses may be limited to a specific story of the building type. See individual building type tables in this section.

c. *Ground Floor Residential and Lodging Use Restrictions.*

i. Residential and lodging units are permitted on the ground floor; provided, however, that no such units shall be located within the occupied space required along the primary street-facing facade.

ii. Notwithstanding any other requirement in this title:

(A) Accessory residential and lodging uses, such as lobbies, meeting rooms, offices, etc., are permitted both within the required occupied space along the primary street-facing facade; and

(B) Residential units may occupy the entirety of a row building in the town center core form district.

iii. *Grade Separation.* Ground floor residential units shall be vertically separated by no more than four feet above or below the sidewalk level.

d. *Occupied Space Requirement.* The occupied space requirement only applies to the required frontage area.

e. *No Other Building Types.* All constructed buildings must meet the requirements of one of the building types permitted within the given form district.

f. *Permanent Structures.* All buildings constructed shall be permanent construction without a chassis, hitch, wheels, or other features that make the structure mobile.

g. Accessory structures are structures located on the same lot as the principal structure(s) with uses that are incidental to the use of the principal structure(s). Examples include a garage, parking structure, storage, utility, maintenance sheds, etc.

i. Structures attached to the principal structure are considered part of the principal structure and are not accessory structures.

ii. Detached accessory structures are permitted according to each building type (see individual building type tables in this section) and shall comply with all setbacks and the following:

(A) Detached accessory structures are not permitted in the front yard or any other space between the principal structure and a right-of-way.

(B) Detached accessory structures shall be located in the rear yard, behind the principal structure.

(C) Detached accessory structures shall not exceed the height of the principal structure.

iii. Accessory structures shall be built in a manner compatible with the principal building and shall use the same or similar quality materials as the principal building.

h. *Building Length.* Maximum and minimum building lengths, as measured along the right-of-way property lines, are determined by frontage coverage and setback distances. See Section 17-7-11.5.

i. *Theme and Unity.* The architectural design within a single development that includes multiple structures shall be organized around a consistent architectural theme in terms of the character, materials, texture, color, and scale of buildings. Restaurants, retail chains, and other franchise-style structures shall adjust their standard architectural theme to be consistent with the development's overall architectural character.

j. *Active Streetscape.* Variation in architecture is encouraged to create a more appealing streetscape. Variety can be achieved through porches, terraces, stoops, awnings, galleries, arcades, balconies, and canopies.

k. Primary entrances for all building types shall be located along the primary street facade.

3. *Building Types.* This FBC describes four building types:

a. General;

b. Limited bay;

c. Row;

d. Civic.

B. *General Building.*

1. *Intent.*

a. The general building type accommodates a wide variety of uses. It is intended to be built close to the front and corner property lines allowing easy access to passing pedestrians and transit riders.

b. Parking may be provided in the rear of the lot, internal to the building, or in an attached parking structure. Vehicular access should be located on the rear or side of the lot, only on the front if the rear or side is unavailable. On lots with more than one street frontage, vehicular access must be located on the side or rear street.

2. *Regulations.*

a. The general building is permitted in all form districts.

b. Regulations for the general building type are defined in Table 6.02 and Figures 6.01a, 6.01b, and 6.01c.

Table 6.02. General Building Requirements

	Form District	MS	TCC
Frontage			
1.	Frontage Type	Primary, Secondary	Primary, Secondary, Tertiary
Use			
2.	Ground Floor	Residential*, Lodging*, Civic, Retail, Service	Residential*, Lodging*, Civic, Retail, Service
3.	Upper Floor(s)	Residential, Lodging, Civic, Office and Industrial	Residential, Lodging, Civic, Office and Industrial
4.	Parking Within Building	Permitted	Permitted
5.	Required Occupied Space	30' min.	30' min.
Siting			
6.	Multiple Principal Buildings	Permitted	Permitted
7.	Occupation of Corner	Required	Required
8.	Accessory Structure	Not Permitted	Not Permitted
9.	Parking/Loading Location	Rear Yard	Rear Yard
10.	Vehicular Access Type	Driveway, Portal	Driveway, Portal
11.	Loading/Service Entrance Location	Rear Yard	Rear Yard

	Form District	MS	TCC
Height			
12.	Principal Building Minimum	2 stories	3 stories
13.	Principal Building Maximum	3 stories	6 stories
14.	Accessory Building Maximum	Not Permitted	Not Permitted
15.	Ground Floor Height (floor to ceiling)	12' min.	12' min.
16.	Upper Floor Height (floor to ceiling)	8' min.	8' min.
Street-Facing Facade(s)			
17.	Entrance Types	Storefront, Arcade	Storefront, Arcade, Stoop
18.	Entrance Spacing Minimum	1/each minor division	1/each minor division
19.	Ground Floor Transparency	50% min.	50% min.
20.	Upper Floor Transparency	20% min.	20% min.
21.	Blank Wall Limitation	Required	Required
22.	Major Division Width	60' min./100' max.	80' min./140' max.
23.	Minor Division Width	30' min./60' max.	40' min./80' max.
24.	Minor Division Features	5 min.	5 min.

	Form District	MS	TCC
25.	Facade Bay Fenestration Features	5 min.	4 min.
26.	Street-Facing Facade Courtyard Width	15' min.	20' min.
Projections			
27.	Primary Street	Awning, Balcony, Canopy, Roof Overhang	Awning, Balcony, Canopy, Roof Overhang
28.	Side/Rear Street	Awning, Balcony, Roof Overhang	Awning, Balcony, Canopy, Roof Overhang
Roof Type			
29.	Permitted Roof Type	Parapet, Pitched, Flat	Parapet, Pitched, Flat
30.	Tower	Only on corner lots	Only on corner lots

***** See Section 17-7-11.6(A)(2)(c)

Figure 6.01a. General Building Siting Diagram

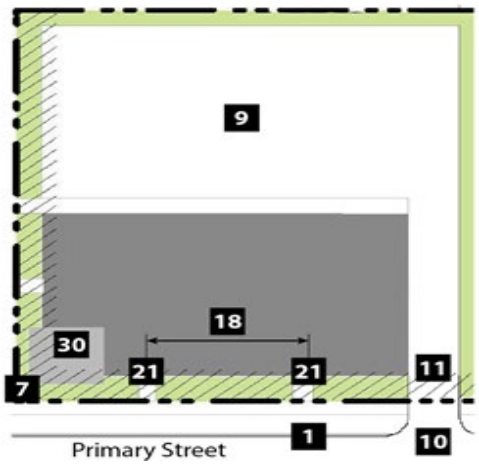


Figure 6.01b. General Building Street Facade Diagram

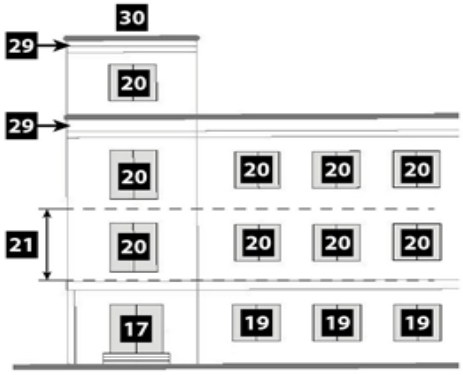
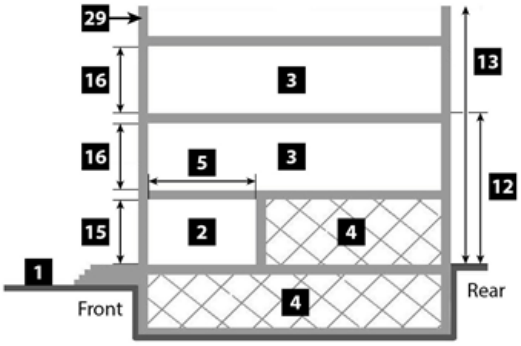


Figure 6.01c. General Building Height and Use Diagram



C. *Limited Bay Building.*

1. *Intent.*

a. The limited bay building type permits a maximum of one vehicle bay per each facade bay along the primary street. A wide range of uses can be accommodated within this building type, including craftsman industrial uses. This building type is still intended to be built close to the front and corner property lines allowing easy access to passing pedestrians and transit riders, continuing the street wall.

b. Parking may be provided in the rear of the lot or internal to the building.

2. *Regulations.*

a. Limited bay buildings are permitted in the TCC form district and are not permitted in the MS form district.

b. Regulations for the limited bay building type are defined in Table 6.03 and Figures 6.02a, 6.02b, and 6.02c.

Table 6.03. Limited Bay Building Requirements

	Form District	MS	TCC
Frontage			

	Form District	MS	TCC
1.	Frontage Type	Not Permitted	Secondary, Tertiary
Use			
2.	Ground Floor	Not Permitted	Residential*, Lodging*, Civic, Retail, Service
3.	Upper Floor(s)		Residential, Lodging, Civic Retail, Service
4.	Parking Within Building		Permitted
5.	Required Occupied Space		30' min.
Siting			
6.	Multiple Principal Buildings	Not Permitted	Not Permitted
7.	Occupation of Corner		Required
8.	Accessory Structure		Not Permitted
9.	Parking/Loading Location		Rear Yard
10.	Vehicular Access Type		Driveway, Portal, Vehicle Bay
11.	Loading/Service Entrance Location		Rear Yard, Bay
Height			

	Form District	MS	TCC
12.	Principal Building Minimum	Not Permitted	3 stories
13.	Principal Building Maximum		6 stories
14.	Accessory Building Maximum		Not Permitted
15.	Ground Floor Height (floor to ceiling)		12' min.
16.	Upper Floor Height (floor to ceiling)		8' min.
Street-Facing Facade(s)			
17.	Entrance Types	Not Permitted	Storefront, Arcade, Stoop
18.	Entrance Spacing Minimum		1/each minor division
19.	Ground Floor Transparency		50% min.
20.	Upper Floor Transparency		20% min.
21.	Blank Wall Limitation		Required
22.	Major Division Width		70' min./120' max.
23.	Minor Division Width		35' min./70' max.
24.	Minor Division Features		4 min.
25.	Facade Bay Fenestration Features		4 min.

	Form District	MS	TCC
26.	Street-Facing Facade Courtyard Width		15' min.
Projections			
27.	Primary Street	Not Permitted	Awning, Balcony, Canopy, Roof Overhang
28.	Side/Rear Street		Awning, Balcony, Canopy, Roof Overhang
Roof Type			
29.	Permitted Roof Type	Not Permitted	Parapet, Pitched, Flat
30.	Tower		Only on corner lots

***** See Section 17-7-11.6(A)(2)(c)

Figure 6.02a. Limited Bay Building Siting Diagram

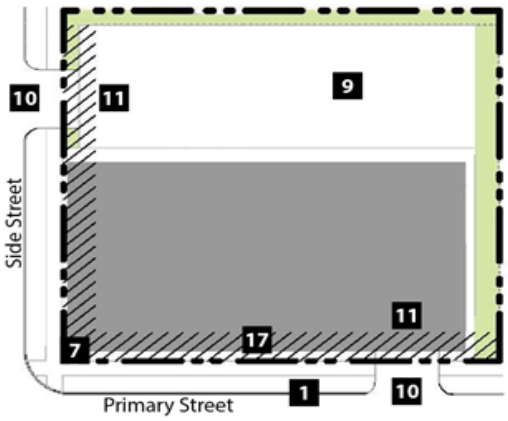


Figure 6.02b. Limited Bay Building Street Facade Diagram

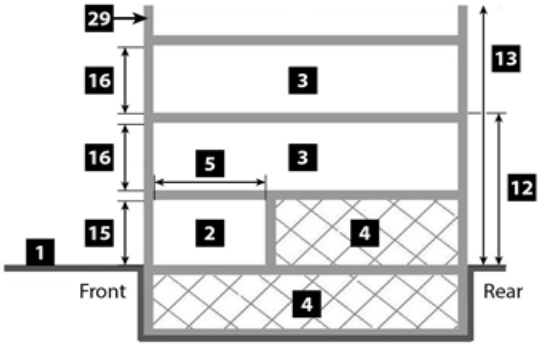
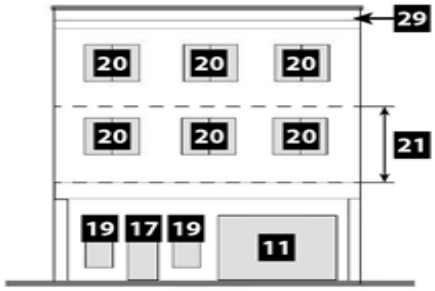


Figure 6.02c. Limited Bay Building Height and Use Diagram



D. *Row Building.*

1. *Intent.*

a. The row building is a building typically comprised of multiple vertical units, each with its own entrance to the street. This building type may be organized as townhouses or rowhouses, or it could also incorporate live/work units where such uses are permitted.

b. Parking is required to be located in the rear yard and may be either an attached or detached garage. All garages shall be accessed from a single shared driveway. For an attached garage, a minimum level of occupied space is required on the front facade to ensure that the street facade is active.

2. *Regulations.*

a. Row buildings are permitted in all form districts.

b. Regulations for the row building type are defined in Table 6.04 and Figures 6.03a, 6.03b, and 6.03c.

Table 6.04. Row Building Requirements

	Form District	MS	TCC
Frontage			
1.	Frontage Type	Primary, Secondary	Primary, Secondary, Tertiary
Use			
2.	Ground Floor	Residential*, Lodging*, Retail, Service	Residential*, Lodging*, Retail, Service, Office and Industrial
3.	Upper Floor(s)	Residential, Lodging, Retail, Service, Office and Industrial	Residential, Lodging, Retail, Service, Office and Industrial
4.	Parking Within Building	Permitted	Permitted
5.	Required Occupied Space	30' min.	30' min.
Siting			
6.	Multiple Principal Buildings	Permitted	Permitted
7.	Occupation of Corner	Required	Required

	Form District	MS	TCC
8.	Accessory Structure	Permitted	Permitted
9.	Parking/Loading Location	Rear Yard	Rear Yard
10.	Vehicular Access Type	Driveway, Portal	Driveway, Portal
11.	Loading/Service Entrance Location	Rear Yard	Rear Yard
Height			
12.	Principal Building Minimum	2 stories	3 stories
13.	Principal Building Maximum	3 stories	6 stories
14.	Accessory Building Maximum	Not Permitted	Not Permitted
15.	Ground Floor Height (floor to ceiling)	12' min.	12' min.
16.	Upper Floor Height (floor to ceiling)	8' min.	8' min.
Street-Facing Facade(s)			
17.	Entrance Types	Storefront, Arcade, Stoop	Storefront, Arcade, Stoop
18.	Entrance Spacing Minimum	1/each minor division	1/each minor division
19.	Ground Floor Transparency	50% min.	50% min.
20.	Upper Floor Transparency	20% min.	20% min.

	Form District	MS	TCC
21.	Blank Wall Limitation	Required	Required
22.	Major Division Width	Not Required	Not Required
23.	Minor Division Width	20' min./40' max.	30' min./45' max.
24.	Minor Division Features	4 min.	4 min.
25.	Facade Bay Fenestration Features	4 min.	3 min.
26.	Street-Facing Facade Courtyard Width	Not Permitted	20' min.
Projections			
27.	Primary Street	Awning, Balcony, Roof Overhang	Awning, Balcony, Roof Overhang
28.	Side/Rear Street	Awning	Awning
Roof Type			
29.	Permitted Roof Type	Parapet, Pitched, Flat	Parapet, Pitched, Flat
30.	Tower	Not Permitted	Not Permitted

***** See Section 17-7-11.6(A)(2)(c)

Figure 6.03a. Row Building Siting Diagrams

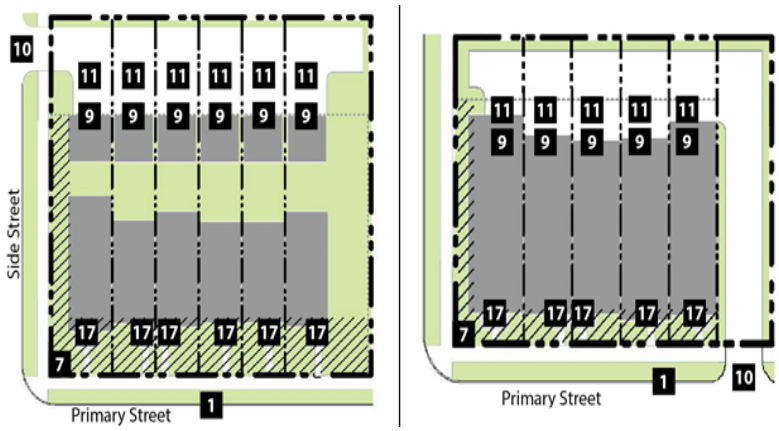
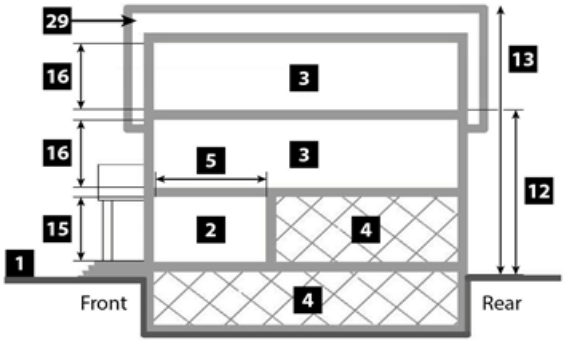


Figure 6.03b. Row Building Street Facade Diagram

Figure 6.03c. Row Building Height and Use Diagram



E. *Civic Building.*

1. *Intent.*

a. The civic building is the most flexible building type, intended only for civic and institutional types of uses. These buildings are distinctive within the urban fabric that is created by the other building types and should be designed as iconic structures.

b. Parking is limited to the rear in most cases.

2. *Regulations.*

a. Civic buildings are permitted in the MS and TCC zones districts.

b. Regulations for the civic building type are defined in Table 6.05 and Figures 6.04a, 6.04b, and 6.04c.

Table 6.05. Civic Building Requirements

	Form District	MS	TCC
Frontage			
1.	Frontage Type	Primary	Primary
Use			
2.	Ground Floor	Civic	Civic
3.	Upper Floor(s)	Civic	Civic
4.	Parking Within Building	Permitted	Permitted
5.	Required Occupied Space	30' min.	30' min.
Siting			

	Form District	MS	TCC
6.	Multiple Principal Buildings	Not Permitted	Permitted
7.	Occupation of Corner	Required	Required
8.	Accessory Structure	Not Permitted	Not Permitted
9.	Parking/Loading Location	Rear Yard	Rear Yard
10.	Vehicular Access Type	Driveway, Portal	Driveway, Portal
11.	Loading/Service Entrance Location	Rear Yard	Rear Yard
Height			
12.	Principal Building Minimum	2 stories	3 stories
13.	Principal Building Maximum	3 stories	6 stories
14.	Accessory Building Maximum	Not Permitted	Not Permitted
15.	Ground Floor Height (floor to ceiling)	12' min.	12' min.
16.	Upper Floor Height (floor to ceiling)	10' min.	10' min.
Street-Facing Facade(s)			
17.	Entrance Types	Storefront, Arcade	Storefront, Arcade
18.	Entrance Spacing Minimum	Not Required	Not Required

	Form District	MS	TCC
19.	Ground Floor Transparency	10% min.	10% min.
20.	Upper Floor Transparency	10% min.	10% min.
21.	Blank Wall Limitation	Not Required	Not Required
22.	Major Division Width	Not Required	Not Required
23.	Minor Division Width	Not Required	Not Required
24.	Minor Division Features	Not Required	Not Required
25.	Facade Bay Fenestration Features	Not Required	Not Required
26.	Street-Facing Facade Courtyard Width	15' min.	20' min.
Projections			
27.	Primary Street	Canopy, Roof Overhang	Canopy, Roof Overhang
28.	Side/Rear Street	Roof Overhang	Roof Overhang
Roof Type			
29.	Permitted Roof Type	Parapet, Pitched, Flat	Parapet, Pitched, Flat
30.	Tower	Permitted	Permitted

Figure 6.04a. Civic Building Siting Diagrams

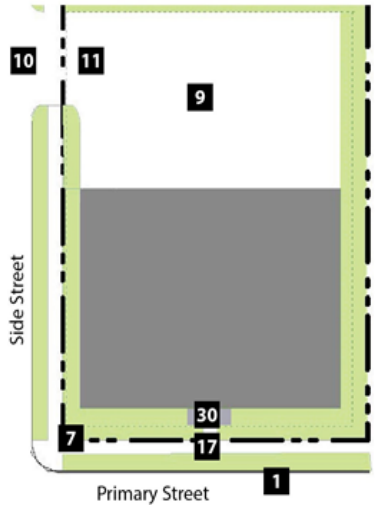


Figure 6.04b. Civic Building Street Facade Diagram

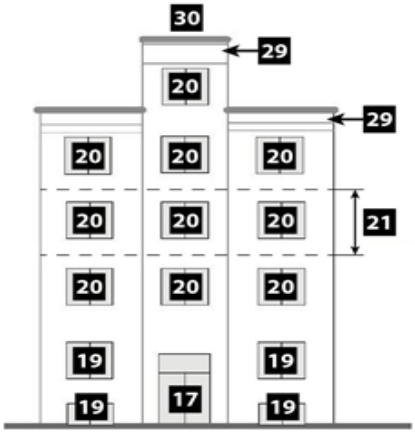
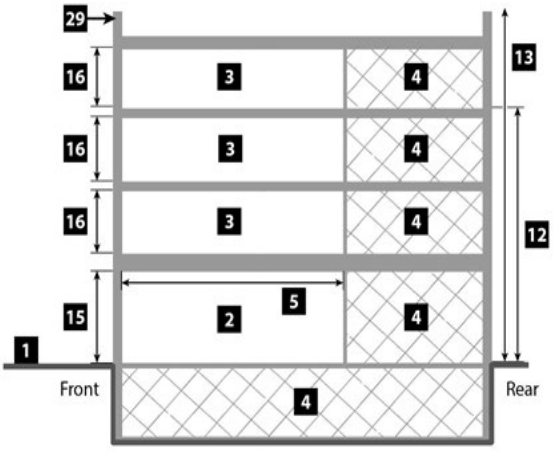


Figure 6.04c. Civic Building Height and Use Diagram



F. *Entrance Types.*

1. *General Provisions.*

a. *Intent.* To guide the design of the ground story of all buildings to relate appropriately to pedestrians on the street. Treatment of other portions of the building facades is detailed in each building type table.

b. *Applicability.* The entire ground story street-facing facade(s) of all buildings shall meet the requirements of at least one of the permitted entrance types, unless otherwise stated.

c. *Measuring Transparency.* Refer to the individual building type tables for information on transparency.

d. *Visible Basements.* Visible basements, permitted by entrance type, are optional. The visible basement shall be a maximum of one-half the height of the tallest story.

2. *Storefront Entrance.* The storefront entrance type is a highly transparent ground story treatment designed to serve primarily as the display area and primary entrance for retail or service uses. See Figure 6.05.

Figure 6.05. Storefront Entrance Example

a. *Transparency.* Minimum transparency is required per building type.

b. Horizontal facade division feature shall define the ground story facade from the upper story facades.

c. *Visible Basement.* A visible basement is not permitted.

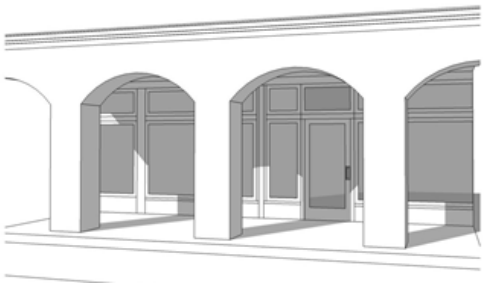
d. *Entrance.* All entries shall be recessed from the front facade closest to the street.

i. Recess shall be a minimum of three feet and a maximum of eight feet deep, as measured from the front facade.

ii. The entrance shall not be recessed into the lot further than the maximum BTZ depth.

3. *Arcade Entrance.* An arcade recesses the entrance back into the ground floor, creating a covered pedestrian area beneath the second story. See Figure 6.06.

Figure 6.06. Arcade Entrance Example



a. *Arcade.* The arcade space is recessed into the building a minimum of eight feet and a maximum of fifteen feet from the front facade. The arcade space is permitted to be recessed into the lot beyond the maximum BTZ depth.

b. *Build-To Zone.* For arcade entrances, the front facade is the implied plane created by the arcade columns. The location of this implied plane facade must be within the required BTZ.

c. *Transparency.* Minimum facade transparency applies to the recessed entry facade and is required per building type.

d. Horizontal facade division feature shall define the ground story facade from the upper story facades.

e. *Recessed Facade Entrance Type.* The entrance type at the facade recessed into the arcade shall be a storefront entrance type with one modification: the door location shall be flush with the adjacent windows and not recessed.

f. *Column Spacing.* Columns shall be spaced between ten and sixteen feet on center.

g. *Column Width.* Columns shall be a minimum of one and one-half feet and a maximum two and one-half feet in width.

h. *Arcade Opening.* The top of the opening shall be lower than the interior arcade ceiling (not flush with the ceiling) and may be arched or straight.

i. *Horizontal Facade Division.* The ground story facade shall be divided from the upper story facades with a horizontal architectural expression.

j. *Visible Basement.* A visible basement is not permitted.

4. *Stoop Entrance.* A stoop is an unroofed, open, elevated platform. The doors on a stoop entrance are accessed from the stoop. See Figure 6.07.

Figure 6.07. Stoop Entrance Example

a. *Transparency.* Minimum transparency is required per building type.

b. Horizontal facade division feature shall define the ground story facade from the upper story facades.

c. *Stoop Size.* Stoops shall be a minimum of three feet deep and six feet wide.

d. *Elevation.* Stoop elevation shall be located a maximum of two and one-half feet above the sidewalk without visible basement and a maximum of four and one-half feet above the sidewalk with a visible basement.

e. *Visible Basement.* A visible basement is permitted and shall be separated from the ground story by an expression line.

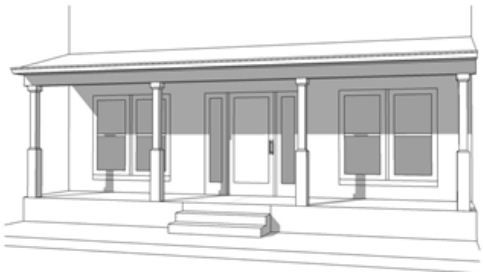
i. The facade of the visible basement must have a minimum transparency of fifteen percent.

ii. A visible basement does not count as a building story.

f. *Entrance.* All entries shall be located off a stoop.

5. *Porch Entrance.* A porch is a raised, roofed platform that may or may not be enclosed on all sides. If enclosed, the space shall not be climate controlled. See Figure 6.08.

Figure 6.08. Porch Entrance Example



a. *Transparency.*

i. Minimum transparency per building type is required.

ii. If enclosed, a minimum of forty percent of the enclosed porch shall be comprised of highly transparent, low reflectance windows.

b. *Porch Size.* The porch shall be a minimum of five feet deep and eight feet wide.

c. *Elevation.* Porch elevation shall be located a maximum of two and one-half feet above the sidewalk without a visible basement and a maximum of four and one-half feet above the sidewalk with a visible basement.

d. *Visible Basement.* A visible basement is permitted and shall be separated from the ground story by an expression line.

i. The facade of the visible basement must have a minimum transparency of fifteen percent.

ii. A visible basement does not count as a building story.

e. *Height.* The porch structure shall not be tall enough to obstruct the windows on the second story.

f. *Porch Roof.* The roof of the porch may be flat or pitched. The roof may include a balcony that is accessed from the second story.

g. *Entrance.* All right-of-way-facing entries shall be located on a porch.

G. *Roof Types.*

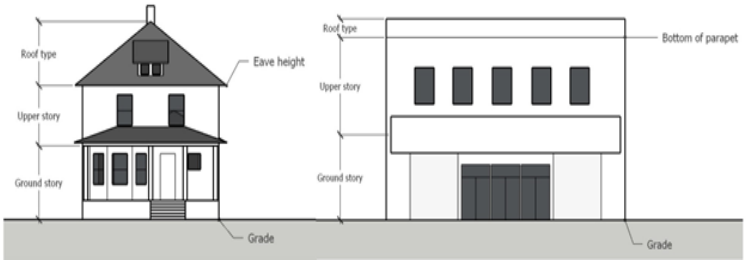
1. *General Provisions.* The following provisions apply to all roof types:

a. *Intent.* To guide the design of the caps of all buildings.

b. *Applicability.* All buildings shall meet the requirements of one of the roof types permitted by building type.

c. *Measuring Height.* See Figure 6.09 for information on measuring roof height.

Figure 6.09. Height Measuring Diagram



d. *Other Roof Types.* Other building caps not listed here as a specific roof type may be requested with the following requirements:

i. The building is deemed as one having special significance to Midvale City or the overall Main Street neighborhood.

ii. The shape of the roof type shall be significantly different from those defined in this section, i.e., dome, spire, vault.

e. *Solar Energy.* Solar panels are permitted for all roof types.

f. *Appearance.* Roofs shall provide an attractive appearance, considering that they may be viewed from above as a fifth facade. Equipment projections and access towers must be set back a minimum of ten feet from the edge of the roof.

2. *Parapet Roof.* A parapet is a low wall projecting above a building's roof along the perimeter of the building. It can be utilized with a flat or low-pitched roof and also serves to limit the view of roof-top mechanical systems from the street. See Figure 6.10.

a. *Parapet Height.* Height is measured from the outermost roof membrane or structure to the top of the parapet.

i. Minimum height is two feet and maximum height is six feet.

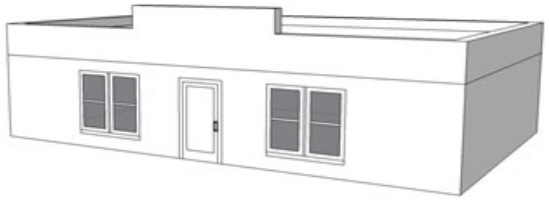
ii. The parapet shall be high enough to screen the roof and any roof appurtenances visible from the street.

b. *Horizontal Expression Lines.* An expression line shall define the parapet from the upper stories of the building and shall also define the top of the cap.

c. *Occupied Space.* Outdoor (unenclosed) roof deck/terrace occupiable space is permitted in this roof type. Such occupiable spaces must meet fire code egress standards. The parapet wall may act as the perimeter barrier if it meets safety standards, otherwise an additional barrier is required.

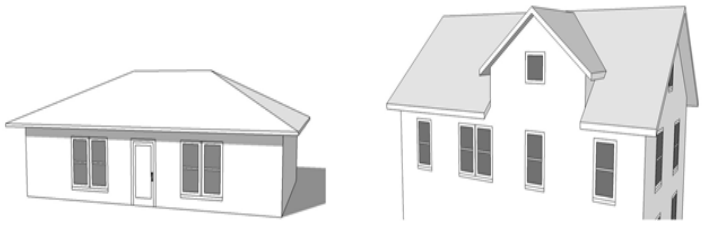
d. *Rooftop Enclosures.* Rooftop enclosures are permitted in this roof type. Occupiable space may not exceed ten percent or four hundred square feet of the roof footprint, whichever is larger. Enclosures must maintain the applicable roof setback.

Figure 6.10. Parapet Roof Example



3. *Pitched Roof.* This roof type is sloped (pitched). Pitch is measured with the vertical rise divided by the horizontal span or run. See Figure 6.11.

Figure 6.11. Pitched Roof Examples



a. *Pitch Measure.* The roof may not be pitched less than 4:12 (rise/run) or more than 12:12.

b. *Configurations.* Hipped, gabled, and combination of hips and gables with or without dormers are permitted.

c. *Parallel Ridge Line.* A gabled end or perpendicular ridge line shall occur at least every one hundred feet of roof length when the ridge line runs parallel to the front lot line.

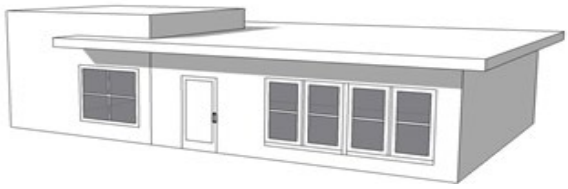
d. *Transparency.* The upper floor transparency and blank wall limitation requirements apply to gable ends when the space within the roof is occupiable. Gable ends are exempt from these transparency requirements if there is no occupiable space within the roof.

e. Roof height, measured from the ridge line down to the top story, is a function of pitch measure.

f. *Occupied Space.* Occupiable attic space, the void within the roof trusses, may be incorporated within this roof type and not count as one story.

4. *Flat Roof.* This roof type has a flat roof with or without overhanging eaves. See Figure 6.12.

Figure 6.12. Flat Roof Example



a. *Configuration.* Roofs with no visible slope are acceptable. Eaves are required on all street-facing facades.

b. *Eave Depth.* Eave depth is measured from the building facade to the outermost element of the eave. Eaves shall have a minimum depth of eighteen inches.

c. *Eave Thickness.* Eave thickness is measured at the outside edge of the eave, from the bottom of the eave to the top of the eave. Minimum eave height is eight inches.

d. Interrupting vertical walls are facade walls below the eave that extend upwards through and above the top of the eave with no discernible cap.

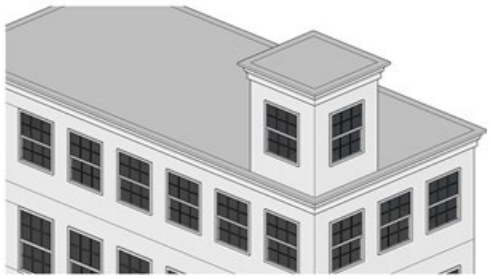
i. No more than one-half of the front facade can consist of an interrupting vertical wall.

ii. Vertical walls shall extend no more than four feet above the top of the eave.

e. *Occupied Space.* Occupied space shall not be incorporated within this roof type.

5. *Towers.* A tower is a rectilinear or cylindrical vertical element, that must be used with other roof types; towers are only allowed on permitted building types and on corner lots. For lots with two corners, the tower is only permitted on the corner with the primary street. A stair tower used for emergency and roof access is exempt from this limit. See Figure 6.13.

Figure 6.13. Tower Example



a. *Quantity.* All building types, with the exception of the civic building, are limited to one tower per building.

b. *Tower Height.* Maximum height, measured from the top of the lower parapet or eave to the top of the tower, is limited to one and one-half times the height of the upper floor of the building on which the tower is located. The tower is not included in the count for maximum number of stories.

c. *Tower Width.* Maximum width along all facades is one-third the width of the front facade or thirty feet, whichever is shorter.

d. *Horizontal Expression Lines.* A horizontal expression line shall define the tower from the upper stories, except on single family or attached house residential building types.

e. *Occupied Space.* Towers may be occupied by the same uses allowed in upper stories of the building type on which they are located. Occupied space within a tower shall not count towards any other rooftop occupied space allowance.

f. *Application.* May be combined with all other roof types.

g. *Tower Cap.* The tower may be capped by the parapet, pitched, or flat roof types.

H. *Lighting Standards.*

1. *Light Source.* Light sources shall be at least as efficient as LED and no greater than 4,000K in correlated color temperature (CCT).

2. Light levels shall be designed such that light trespass measured at the property line does not exceed 0.01 foot-candles.

3. Light fixtures shall use a cut-off luminaire that is fully or partially shielded with no light distributed above the horizontal plane of the luminaire or into nearby residential structures.

4. In no case shall the total lumens emitted for a single site exceed one hundred thousand lumens per acre.

5. *Parking Lot Lighting.* Parking lot lighting shall be designed and constructed to comply with the following standards:

a. *Pole Height/Design.*

i. Luminaire mounting height is measured from the parking lot or driveway surface and may range from ten feet to thirty feet, based on review of site plan, proposed land uses, surrounding land uses, parking area size, building mass, topography of site, and impacts on adjacent properties.

ii. Poles and fixtures shall be black, dark brown, or another neutral color approved by the community development director.

iii. All attempts shall be made to place the base of light poles within landscape areas.

iv. Light poles in parking areas shall not exceed thirty feet in height. Poles exceeding twenty feet in height are appropriate only for parking areas exceeding two hundred stalls and not in close proximity to residential areas.

6. *Other Outdoor Lighting Standards.*

a. Wall-mounted lighting fixtures shall not be located above eighteen feet in height unless being used as building accent lighting. Fixture styles and finishes shall complement the building exterior.

b. Lighting located along pedestrian pathways or in areas primarily dedicated to human activity shall be bollard-style lighting or down-directed lighting not to exceed twelve feet in height. Pedestrian lighting shall be coordinated through each project and shall complement adjacent projects to the greatest extent practical.

c. In order to avoid light pollution, backlit awnings and floodlights are prohibited.

Deleted: , up-light spotlights,

d. Street lighting shall either be chosen from the city's approved streetlight list or installed to match a theme set by developments within the zone or neighborhood.

7. *Upgrading Preexisting Lighting.* An applicant must bring preexisting lighting into compliance with this code upon application with the business license department for a change in ownership, new business in a stand-alone structure or in a multi-tenant structure in which the new business utilizes more than fifty percent of the building square footage on the site, in conjunction with an application for a building permit for any alteration, remodel or expansion of any structure on the site, or in conjunction with changes to the approved site plan.

8. *Lighting Plan Submission Requirements.* A lighting plan is required for all developments and must contain the following:

a. Plans indicating the location on the premises, and the type of illumination devices, fixtures, lamps, supports, reflectors, installation and electrical details;

b. Description of illuminating devices, fixtures, lamps, supports, reflectors, and other devices that may include, but is not limited to, manufacturer catalog cuts and

drawings, including section where required; and photometric data, such as that furnished by manufacturers, or similar showing the angle of the cutoff or light emission;

c. A point-by-point light plan to determine the adequacy of the lighting over the site.

I. *Additional Design Standards.* This section outlines the town center design standards that affect a building's appearance and quality. The intent is to improve the physical quality of buildings, enhance the pedestrian experience, protect the character of the neighborhood, create visual interest, and contribute to its sense of place.

1. *Materials and Color.*

a. *Primary Street-Facing Facade Materials.* A minimum of eighty percent of each facade shall be constructed of primary materials. For facades over one hundred square feet, more than one material shall be used to meet the eighty percent requirement. Permitted primary building materials include high quality, durable, natural materials, such as stone; brick; wood lap siding; fiber cement board; lapped, shingled, or panel siding; or glass. Other high-quality synthetic materials may be approved by the community development director during the site plan process.

b. *Secondary Street-Facing Facade Materials.* Secondary materials on primary street-facing facades are limited to details and accents and include gypsum reinforced fiber concrete for trim and cornice elements; metal for beams, lintels, trim, and ornamentation; and exterior architectural metal panels and cladding. Exterior insulation and finishing systems (EIFS) are permitted for trim only or on upper floor facades, up to twenty percent of total.

c. *Roof Materials.* Acceptable roof materials include three-hundred-pound, or better, dimensional asphalt composite shingles, wood shingles and shakes, metal tiles or standing seam, slate, and ceramic tile. "Engineered" wood or slate may be approved during the site plan process with an approved sample. Membrane roofs are acceptable for flat roofs with no surface visible from the street.

d. *Color.* Main building colors shall be complementary to existing building stock, where applicable.

e. *Appropriate Grade of Materials.* Commercial-quality doors, windows, and hardware shall be used on all building types with the exception of the row building type.

f. *Restricted Materials List.*

i. Vinyl or aluminum siding, highly reflective metal, mirrored windows, and plain cement block materials are prohibited.

ii. Stucco is only permitted when used on facades that do not face public streets, adjacent residential areas, or open space.

2. *Windows, Awnings, and Shutters.*

a. *Windows.* Transparency requirements vary by building type.

b. *Awnings.* All awnings shall be canvas, metal, glass, or wood. Plastic awnings are not permitted. Awning types and colors for each building face shall be coordinated. Awnings shall provide a minimum of an eight-foot vertical clearance above ground plane.

c. *Shutters.* If installed, shutters, whether functional or not, shall be sized for the windows. If closed, the shutters shall not be too small for complete coverage of the window. Shutters shall be wood or metal. “Engineered” wood may be approved during the site plan process.

3. *Drive-Through Structures.* Drive-through structures are not permitted in any form district or with any building type.

4. *Meters and Equipment Placement.* Equipment shall be screened from view and not located on a public frontage.

5. *Waste Containers.* Waste containers shall be located out of public view and screened with landscaping and/or a structure that is compatible with the theme of the adjacent building.

6. *Residential Development Requirements.* Residential rental developments shall include visitability features for at least ten percent of units, including no-step entries, ADA restrooms and accessible controls. (Ord. 2020-04 § 1 (Att. A (part)))

17-7-11.7 Open space.

A. *General Requirements.*

1. *Intent.* To provide open space as an amenity that promotes physical and environmental health within the community and to provide each household with access to a variety of active and passive open space types.

2. *Applicability.* Open space types are permitted, not permitted, or limited according to each form district. See Table 7.01.

Table 7.01. Open Space Type by Form District

Open Space Type	*Form District*	
	MS	TCC
Pocket Park	P	P
Town Square	P	P
Park	P	P
BTZ Pedestrian Space	L	L
P = Permitted	N = Not Permitted	
L = Limited by Building and Frontage Type		

3. All open spaces shall meet the following general requirements:

a. All open spaces within the Main Street FBC district shall comply with one of the open space types as defined in this section.

b. All open space types shall provide public access from a vehicular and/or pedestrian right-of-way.

c. Pocket park, town square, and park open spaces shall be platted as a parcel or group of parcels or, with permission from the city, may be located within a right-of-way.

d. Unless prohibited, open space types may incorporate fencing; provided, that the following requirements are met:

i. Fencing shall be a maximum height of three feet unless approved by the community development director for such circumstances as proximity to railroad right-of-way or use around swimming pools, ball fields, and ball courts.

ii. Fence opacity shall be no greater than sixty percent. Landscaping is exempt from this opacity requirement.

iii. Chain-link fencing is not permitted, with the exception of dedicated sports field or court fencing as approved by the community development director.

iv. If a fence is built along a street front, openings, with or without gates, shall be provided on each individual street front with a minimum spacing of one opening every one hundred feet or a minimum of one opening on street fronts that are less than one hundred feet.

e. Ownership of all open space types may be either public or private.

f. Parking shall not be required for an open space type, unless a use other than open space is determined by the city.

g. Continuity of connections to existing or planned trails or open space types shall be made when the open space abuts key trail corridors or another open space type.

4. *Requirements.*

a. The following further explains or defines the requirements for each open space type. Refer to Tables 7.02 through 7.05 for the specific requirements of each open space type.

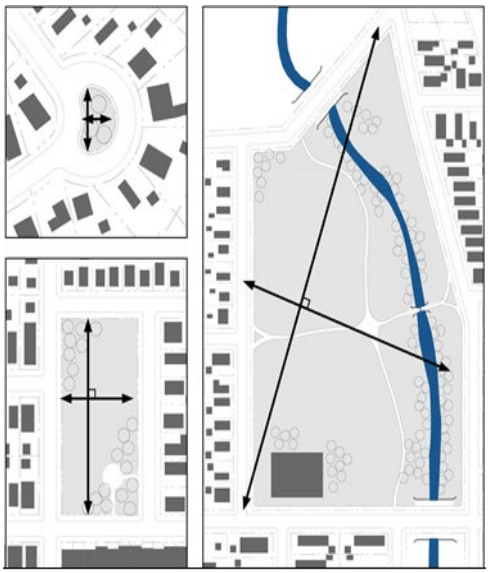
b. *Dimensions.*

i. The minimum area of all open space types is measured within the lot lines of the property.

ii. The maximum area of all open space types is measured within the lot lines of the property.

iii. The minimum dimension requirement is a way to make sure that the size of an open space is not too small for its particular open space type. The minimum dimension for all open space types is derived from overlaying the open space plan with two straight lines that intersect at right angles and whose endpoints are at the outer property lines. The first line is placed at the longest distance across the open space. The second line crosses the first line at a right angle at the place on the first line that follows the longest distance in the direction perpendicular to the first line. The "minimum dimension" is the shorter of these two lines. Figure 7.01 shows three examples of measuring the minimum dimension.

Figure 7.01. Minimum Dimension Measurement Examples



c. The minimum access requirement ensures access and visibility for the open space. It is described in two ways:

i. The percentage of the total perimeter that must be adjacent to a public right-of-way.

ii. The minimum number of and/or spacing between access points into the open space.

d. Adjacent lots are those which are directly adjacent to or directly across the street from an open space.

i. The adjacent form district requirement places a restriction on open spaces which are located adjacent to a form district boundary. The given open space type is permitted to be adjacent to the listed form district(s).

ii. The preferred orientation of adjacent lots is toward the open space. The given open space type is permitted adjacent to, or across the street from, the listed property line type(s).

e. Improvements of the following types may be permitted in an open space:

i. Sports fields are fields or courts that are designed for one or more specific sports.

(A) Sports fields areas are limited in size, expressed as a maximum percentage of the total park area.

(B) Paved sports courts do not count toward pavement requirements.

ii. Playgrounds are defined areas with play structures and equipment, such as slides, swings, and climbing structures, typically for children under twelve years old.

iii. *Structures.*

(A) Fully enclosed inhabitable structures are permanent structures with a roof and walls with closeable doors that fully enclose the space. They are intended for uses such as, but not limited to, park offices, maintenance sheds, community centers, and restrooms.

(B) Open-air inhabitable structures are permanent structures with a roof or overhead covering and partially or fully open sides. Examples include, but are not limited to, gazebos, pavilions, pergolas, and shade structures.

(C) Landscape structures are permanent uninhabitable structures that are used for aesthetic purposes or active uses that are not a sports field/court or playground. Examples include, but are not limited to, water features, monuments, sculptures, splash pads, climbing walls, and skate parks.

iv. The pavement requirements are expressed as percentages of the total area of the open space, as measured within the lot boundaries. Paved areas may use impervious and/or semi-pervious paving materials. Three percentages are given:

(A) The minimum total area is the smallest permitted paved area and includes the sum of both impervious and semi-pervious paved areas.

(B) The maximum total area is the largest permitted paved area and includes the sum of both impervious and semi-pervious paved areas.

(C) The maximum impervious pavement area is the largest area permitted to be paved with impervious paving materials. This maximum impervious pavement percentage is lower than the maximum total percentage so the use of semi-pervious areas are required to reach the maximum total paved area. With no minimum for impervious paved area, the maximum total area may be reached by using only semi-pervious materials.

(D) Paved sports courts are not counted in the pavement requirement percentages.

v. *Lighting makes open spaces useful after sunset and improves nighttime safety.* Each open space type requires lighting, but the amount and type of lighting differs with each open space type and design. Except as required in this section, lighting in open spaces shall be subject to the same lighting standards as buildings.

vi. Seating is an important component of all open spaces; it encourages people to stop and spend time in the open space rather than just pass through and allows people with different mobility and physical needs to enjoy the open space. Each open space type requires seating, but the amount and type of seating differs with

each open space type and design. The following principles apply to open space seating:

(A) Seat counts for manufactured seat furniture shall be counted according to the manufacturer's specifications. For built-on-site seating, such as seat walls, steps, and benches, each two feet of linear seating shall be considered one seat.

vii. "Landscaping" refers to areas that are planted with live plants. These areas are subdivided into lawns (expanses of turf grass) and planted areas (plants that are not turf grass). Trees can be planted in both lawns and planted areas. Landscape designs will vary widely between open space types and are based on specific site characteristics and design goals.

viii. Bicycle facilities located in open spaces are an important part of the active transportation network. The amount and type of bicycle facilities differs with open space type and design. The following principles apply to open space bicycle facilities:

(A) Bicycle rack locations shall be convenient to rights-of-way or other connections to the active transportation network, be visible in the daytime and well-lit at night in order to deter bike theft.

(B) Each bicycle rack shall have an appropriate amount of clear space around it so that loading and unloading a bicycle from the rack shall not impede any adjacent pedestrian walkway.

(C) Bicycle racks with permanent coverings are encouraged.

f. BTZ pedestrian space is the space between the primary facade of a building and the adjacent right-of-way property line when the facade is located within the BTZ and away from the property line. BTZ pedestrian space is not required. Buildings with primary facades located directly on the right-of-way property line have no BTZ pedestrian space.

i. BTZ pedestrian space regulations apply only to the general, limited bay, and civic building types and only along primary frontages.

ii. Depth is measured from the right-of-way property line, perpendicular to the property line, to the portion of the building facade that is furthest from the property line.

iii. May include paved areas and/or planted areas.

(A) BTZ pedestrian spaces must include paved walkways/driveways to all pedestrian and vehicular entrances in the facade.

(B) Planted areas shall be enclosed with six-inch-high curbing.

(C) Trees are not permitted in any BTZ pedestrian space.

iv. Must be open to the street and shall only be enclosed by the primary building facade.

(A) Shall not be enclosed with any overhead roof structure or building mass. Shade structures are permitted.

(B) Shall not be enclosed with any fencing, walls, or hedges.

v. Shall be open to public use.

5. *Stormwater in Open Space Types.* Stormwater management structures, such as storage and retention facilities, may be integrated into open spaces and used to meet stormwater requirements for surrounding lots.

a. Stormwater features in open spaces may be designed as formal or natural amenities with additional uses other than stormwater management, such as an amphitheater, sports field, or a pond or pool as part of the landscape design. Stormwater features shall not be fenced and shall not impede public use of the land they occupy.

b. A qualified professional such as a landscape architect, certified landscape designer, or civil engineer shall prepare and/or review plans for any open space that incorporates stormwater features.

B. *Pocket Park.*

1. *Intent.* Pocket park areas may be appropriate in certain areas of the district. These parks may be very narrow or otherwise constrained in ways that would make a more traditional larger park unfeasible.

2. *General Requirements.* Pocket parks should be strategically located, if possible. Pocket parks are a valuable temporary use on lots that are undeveloped. Regulations for the pocket park open space type are defined in Table 7.02.

Table 7.02. Pocket Park Requirements

Dimensions		
1.	Minimum Area	0.10 acres
2.	Maximum Area	0.25 acres
3.	Minimum Dimension	None
4.	Minimum Access	1 pedestrian entry to right-of-way for every 20' of frontage
Adjacent Lots		
5.	Adjacent Form District(s)	Any
6.	Adjacent Lot Lines	Side, Rear
Improvements		
7.	Permitted Sports Fields/Courts	Not Permitted

8.	Playground	Permitted
9.	Permitted Structures	Open-air inhabitable, water feature, monument, sculpture, splash pad
10.	Minimum Paving Total Area	15%
11.	Maximum Paving Total Area	30%
12.	Maximum Impervious Pavement Area	20%
13.	Lighting	Required, 16' max fixture height
14.	Seating	1 per 500 SF
15.	Landscaping	50% min. live plant coverage in planted areas at maturity, excluding trees
16.	Trees	1 per 1000 SF
17.	Bicycle Facilities	1 rack per 1200 SF, minimum 3. 1 bicycle repair station at 10,000 SF.

C. *Town Square.*

1. *Intent.* A high-quality town square space can become the "heart" of a community, when located effectively and with the right amount of attention given to how the space is used and designed. Town squares do not need to be large in size but should be well located in the most highly concentrated and pedestrian-oriented parts of the community.

2. *General Requirements.* Town squares should be well designed, and located in visible and easily accessed places.

a. Town squares shall be fronted by public streets or primary building facades and surrounded by activity on all sides.

b. Town squares may not be located behind parking lots.

c. Regulations for the town square open space type are defined in Table 7.03.

Table 7.03. Town Square Requirements

Dimensions		
1.	Minimum Area	0.50 acres
2.	Maximum Area	2 acres
3.	Minimum Dimension	35'
4.	Minimum Access	50% of perimeter open to street frontage
Adjacent Lots		
5.	Adjacent Form District(s)	Any
6.	Adjacent Lot Lines	Front
Improvements		

7.	Permitted Sports Fields/Courts	Not Permitted
8.	Playground	Not Permitted
9.	Permitted Structures	Open-air inhabitable, water feature, monument, sculpture, kiosk
10.	Minimum Paving Total Area	30%
11.	Maximum Paving Total Area	75%
12.	Maximum Impervious Pavement Area	50%
13.	Lighting	Required, 16' max fixture height
14.	Seating	1 per 500 SF
15.	Landscaping	50% min. live plant coverage in planted areas at maturity, excluding trees
16.	Trees	1 per 1000 SF
17.	Bicycle Facilities	1 rack per 1200 SF, minimum 3 1 bicycle repair station at 10,000 SF, plus 1

		additional bicycle repair station for each additional 1.0 acre

D. *BTZ Pedestrian Space.*

1. *Intent.* Pedestrian spaces within the BTZ are an extension of the pedestrian realm public space. They are an effective way to improve the appearance, function, and experience of the streetscape. These small pedestrian spaces provide distinction to individual buildings, spatial diversity within building facades, and functional outdoor space for activities like cafes, seating, and displays.

2. *General Requirements.* BTZ pedestrian space is not required. These BTZ pedestrian space requirements apply only to the general, limited bay, and civic building types and only along primary frontages.

a. The location, size, quantity, and proportions of any BTZ pedestrian spaces shall take into consideration the specific features of the facade, including facade bay configuration, entrance type and quantity, and both major and minor division features.

b. Regulations for the BTZ pedestrian space open space type are defined in Table 7.04.

Table 7.04. BTZ Pedestrian Space Requirements

Dimensions		
1.	Minimum Depth	None
2.	Maximum Depth	BTZ Depth
3.	Minimum Width	None
4.	Maximum Width	Length of primary frontage

Frontage and Building Types		
5.	Permitted Frontage Types	Primary
6.	Permitted Building Types	General, Limited Bay, Civic
Improvements		
7.	Permitted Structure	Monument, sculpture, water feature
8.	Minimum Paved Area	1 walkway per pedestrian entrance 1 driveway per vehicular entrance
9.	Lighting	Permitted, bollard lights, landscaping lights, 16' max. pole fixture height
10.	Seating	Permitted
11.	Landscaping	50% min. live plant coverage in planted areas at maturity, excluding trees
12.	Bicycle Facilities	Permitted

E. *Park.*

1. *Intent.* Park space is important to every community, but it must be located and designed in order to be used by a variety of users at all times of the day and all days of the week. Park space should be oriented to pedestrian networks, including convenient access to trail networks.

2. *General Requirements.* Parks should be designed to be sensitive to community limitations on water usage and maintenance resources. Parks should be appropriately scaled to focus on neighborhood usage and be open to and welcome all users.

a. Parks are only permitted to be constructed by government entities for public use. Any project proposing a park open space shall provide for ongoing maintenance meeting or exceeding those standards defined in Section 17-7-11.8.

b. Regulations for the park open space type are defined in Table 7.05.

Table 7.05. Park Requirements

Dimensions		
1.	Minimum Area	None
2.	Maximum Area	None
3.	Minimum Dimension	80'
4.	Minimum Access	25% of perimeter open to street frontage
Adjacent Lots		
5.	Adjacent Form District(s)	Any
6.	Adjacent Lot Lines	Front, Side
Improvements		

7.	Permitted Sports Fields/Courts	Basketball, tennis, volleyball, pickleball
8.	Playground	Permitted
9.	Permitted Structures	Open-air inhabitable, water feature, monument, sculpture, splash pad
10.	Minimum Paving Total Area	10%
11.	Maximum Paving Total Area	25%
12.	Maximum Impervious Pavement Area	15%
13.	Lighting	Required, 16' max fixture height
14.	Seating	1 per 500 SF
15.	Landscaping	50% min. live plant coverage in planted areas at maturity, excluding trees
16.	Trees	1 per 1000 SF
17.	Bicycle Facilities	1 rack per 1200 SF, minimum 3. 1 bicycle repair station at 10,000 SF, plus 1

		additional bicycle repair station for each additional 1.0 acre

(Ord. 2021-08 § 1 (Att. A); Ord. 2020-04 § 1 (Att. A (part)))

17-7-11.8 Landscaping.

A. *General Requirements.*

1. *Intent.* The landscape standards outlined in this section are designed to meet the following set of goals:

a. To provide for healthy, long-lived street trees within all public ways to improve the appearance of streets and to create a buffer between pedestrian and vehicular travel lanes.

b. To increase the compatibility of adjacent uses and minimize the adverse impacts created by adjoining or neighboring uses.

c. To promote the prudent use of water and energy resources by achieving and maintaining sustainable, functional landscapes.

d. To shade large expanses of pavement and reduce the urban heat island effect.

2. *Applicability.* Landscaping, trees, and buffers shall be installed as detailed in this section.

a. *General Compliance.* Application of this section to existing uses shall occur with the following developments:

i. *Any development of new or significant improvements to existing parking lots, loading facilities, and driveways.* Significant improvements include new driveways, new spaces, new medians, new loading facilities, or complete reorganization of the parking and aisles.

ii. Alteration to an existing principal or accessory structure that results in a change of fifteen percent or more in the structure's gross floor area.

iii. When compliance is triggered for existing parking lots, landscape improvements shall take precedence over parking requirements.

b. Landscape buffers are required according to the provisions in this section with the following exceptions:

i. *Shared Driveways.* Buffers shall not be required along a property line where a curb cut or aisle is shared between two adjoining lots.

ii. *Points of Access.* Buffering is not required at driveways or other points of access to a lot.

c. These provisions do not apply to temporary uses, unless determined otherwise by the community development director.

B. *Landscaping Installation.*

1. *Intent.* The following provisions aid in ensuring that all required landscaping is installed and maintained properly.

2. *Applicability.* These provisions apply to landscape installation as required by this section.

3. *General Installation Requirements.* The installation of landscaping shall adhere to the following standards:

a. *National Standards.* Best management practices and procedures according to the nationally accepted standards shall be practiced.

i. *Installation.* All landscaping and trees shall be installed in conformance with the practices and procedures established by the most recent edition of the American Standard for Nursery Stock (ANSI Z60.1) as published by the American Association of Nurserymen.

ii. *Maintenance and Protection.* All landscaping and trees shall be maintained according to the most recent edition of the American National Standards Institute, including its provisions on pruning, fertilizing, support systems, lighting protection, and safety.

b. *Installation.* Landscaping shall be fully installed prior to the issuance of a certificate of completeness.

i. If seasonal conditions preclude the complete installation, a cash escrow or irrevocable letter of credit, equal to the installation costs as estimated by a qualified professional.

ii. Complete installation is required within nine months of the issuance of the temporary certificate of completeness or occupancy permit or the cash escrow or letter of credit may be forfeited.

c. *Condition of Landscape Materials.* The landscaping materials used shall be:

i. Healthy and hardy with a good root system.

ii. Chosen for their form, texture, color, fruit, pattern of growth, and suitability to local conditions.

iii. Tolerant of the natural and manmade environment, including tolerant of drought, wind, salt, and pollution.

iv. Appropriate for the conditions of the site, including slope, water table, and soil type.

v. Protected from damage by grates, pavers, or other measures.

vi. Plants that will not cause a nuisance or have negative impacts on an adjacent property.

vii. Species native or naturalized to the Wasatch Front, whenever possible.

d. Compost, mulch, and organic matter may be utilized within the soil mix to reduce the need for fertilizers and increase water retention.

e. *Establishment.* All installed plant material shall be fully maintained until established, including watering, fertilization, and replacement as necessary.

4. *Ground Plane Vegetation.* All unpaved areas shall be covered by one of the following:

a. *Planting Beds.*

i. Planting beds may include shrubs, ornamental grasses, ground cover, vines, annuals, or perennials.

ii. Planting beds shall be planted such that a minimum of fifty percent their area is covered by live plant material at plant maturity. Tree canopies are not included in coverage calculations.

iii. Nonliving materials, such as colored gravel or organic mulch, are permitted to be visible in no more than fifty percent of a bed area. Mulch depth should be a minimum of three inches.

iv. Annual beds must be maintained seasonally and replanted as necessary.

b. Turf grass is not permitted in any of the three landscape zones described in this section.

c. Planting beds shall be designed and maintained to provide adequate visibility in the sight distance triangle.

i. Planting plans around known signage locations shall select low-growing plants to provide long-term sign visibility with minimal maintenance.

ii. Planting beds near pedestrian and vehicular intersections shall be designed to maintain safe sight lines for pedestrians and drivers.

5. *Tree Installations.*

a. *Tree Measurement.* New trees shall be measured at six inches above the mean grade of the tree's trunk when four-inch caliper or less and twelve inches for tree trunks above four inches and noted as caliper inches throughout this section.

b. *Tree Maintenance.* Tree trimming, fertilization, and other similar work shall be performed by or under the management of an ISA certified arborist.

c. *Tree Size.* All trees to be installed to meet the requirements of this section shall be a minimum of two-inch caliper at the time of installation.

d. *Structural Soil and Soil Cells.* When a tree is to be planted within a park strip or paved area such as a plaza (and the pavement is not yet installed), structural soil is required underneath the adjacent pavement. Structural soil is a medium that can be compacted to pavement design and installation requirements while still permitting root growth. It is a mixture of gap-graded gravels (made of crushed stone), clay loam,

and a hydrogel stabilizing agent to keep the mixture from separating. It provides an integrated, root penetrable, high strength pavement system that shifts design away from individual tree pits.

e. Energy conservation can be enhanced by plant placement. Plantings shall be designed to reduce the energy consumption needs of the development.

i. Deciduous trees should be placed on the south and west sides of buildings to provide shade from the summer sun and allow heat from the winter sun to reach the buildings.

ii. Evergreen plants and other plant materials should be concentrated on the north side of buildings to dissipate the effect of winter winds.

6. *Irrigation Systems.* Permanent irrigation, beyond establishment, is required and shall adhere to the following standards:

a. All irrigation systems shall be designed to minimize the use of water.

b. Nonresidential landscape irrigation shall have an automatic clock-activated permanent controller and shall be smart and weather-based instead of clock-based. A WaterSense label or industry equivalent is required.

c. The irrigation system shall provide sufficient coverage to all landscaped areas.

d. The irrigation system shall not spray or irrigate impervious surfaces, including sidewalks, driveways, streets, and parking and loading areas.

e. All systems shall be equipped with a backflow prevention device.

f. All mechanical systems including controllers and backflow prevention devices shall be properly screened from public view.

7. *Maintenance of Landscape.* All landscaping shall be maintained in good condition at all times to ensure a healthy and orderly appearance.

a. All required landscaping shall be maintained to adhere to all requirements of this chapter.

b. Unhealthy plants shall be replaced with healthy, live plants by the end of the next applicable growing season. This includes all plant material that shows dead branches over a minimum of twenty-five percent of the normal branching pattern.

c. The owner is responsible for the maintenance, repair, and replacement of all landscaping, screening, and curbing required herein.

d. Maintenance shall preserve at least the same quantity, quality, and screening effectiveness as initially installed.

e. Fences, walls, and other barriers shall be maintained in good repair and free of rust, flaking paint, graffiti, and broken or damaged parts.

f. Tree topping is not permitted. When necessary, crown reduction thinning or pruning is permitted.

g. All landscaped areas regulated by this section may be inspected by the city.

C. *Street Trees.*

3. *Minimum Street Tree Requirements.* The following standards apply to the installation of street trees:

a. The minimum clear branch height in the MS and TCC districts is eight feet.

b. Street tree species shall be selected according to the conditions of the park strip and in compliance with Tables 8.01 through 8.05. A certified arborist may recommend species to be approved by the city on a per-project basis.

c. Street tree spacing requirements are defined by street type.

d. Street trees may be planted in tree wells with grates or in planting beds, as defined by street type.

4. *Streetscape Design.* Street trees are located in the public right-of-way and are included in the streetscape design for each street.

Table 8.01. Small Street Trees

for use under power lines

1.	Crabapples (fruitless only)	2.	Whitebeam Mountain Ash
3.	Golden Rain Tree	4.	Eastern Redbud
5.	Japanese Tree Lilac	6.	Hedge Maple
7.	Amur Maple	8.	Rocky Mountain Maple
9.	Tatarian Maple	10.	Green Mountain Ash
11.	Dwarf Littleleaf Linden	12.	Zelkova

Table 8.02. Small Street Trees

for landscape zones less than five feet wide

1.	Any of the trees in Table 8.01		
2.	Amur Chokecherry	3.	Turkish Filbert
4.	Thornless Hawthorn	5	Netleaf Hackberry
6.	European Mountain Ash	7.	Paperbark Maple
8.	Red Horsechestnut	9.	Hardy Rubber Tree
10.	Kwanzan Cherry		

Table 8.03. Medium Street Trees

for landscape zones between five and eight feet wide

1.	Hedge Maple	2.	Velvet Ash
3.	Littleleaf Linden	4.	Yellowwood
5.	Lacebark Elm	6.	Fairview Maple
7.	Pyramidal Hornbeam	8.	Chinese Fringe Tree
9.	Thornless Honeylocust	10.	Frontier Elm
11.	Briotii Horsechestnut	12.	Sensation Boxelder
13.	Manchurian Ash	14.	Purple Robe Locust

Table 8.04. Large Street Trees

for landscape zones wider than eight feet

1.	American Linden	2.	Patmore Seedless Ash
3.	Common Hackberry	4.	Red Oak
5.	English Oak	6.	Silver Linden
7.	European Beech	8.	Sycamore Maple
9.	Ginkgo (male variety only)	10.	Accolade Elm
11.	Japanese Zelkova	12.	Cimmaron Ash
13.	Marshall Seedless Green Ash	14.	Thornless Honeylocust

15.	Japanese Pagoda Tree	16.	Kentucky Coffeetree
17.	London Planetree	18.	Sterling Silver Linden

Table 8.05. Prohibited Street Trees

1.	Aspen	2.	Fruit-bearing trees
3.	Balm of Gilead	4.	Nut-bearing trees
5.	Gambel Oak	6.	Birch (all species)
7.	Mayday Tree	8.	Black Locust
9.	Mulberry (all species)	10.	Common Box Elder
11.	Russian Olive	12.	Catalpa
13.	Saskatoon Serviceberry	14.	Chinese Date
15.	Cottonwood (all species)	16.	Silk Tree
17.	Flowering Plum	18.	Conifers (all species)
19.	Willow (all species)	20.	Flowering Pear (all varieties)

D. *Landscape Areas.*

1. *Intent.* To increase the compatibility of adjacent uses and minimize the adverse impacts created by adjoining or neighboring uses. This is accomplished by defining three different types of landscape areas. These areas help to screen, separate, and define the edges of a lot and the interior of surface parking lots. Landscaping is only permitted to be installed in the areas defined in this section or as part of an open space area described in Section 17-7-11.7.

2. The three landscape areas are:

   a. Parking lot frontage buffers;

   b. Parking lot interior landscape; and

   c. Side and rear landscape buffers.

E. *Parking Lot Frontage Buffers.*

1. *Intent.* Landscaped buffers around parking lots are designed to reduce the visual impact of vehicular areas on public streets and adjacent properties.

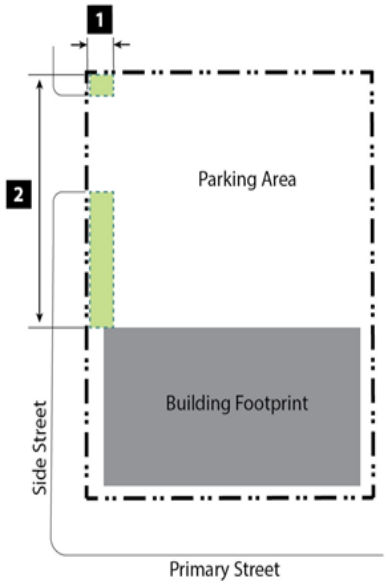
2. *Applicability.* Applies to properties in all form districts where a parking lot abuts a street frontage. Regulations for the parking lot frontage buffer landscape area type are defined in Table 8.06 and Figure 8.01.

Table 8.06. Parking Lot Frontage Buffer Requirements

Buffer Requirements		
1.	Depth	5'0" min.
2.	Location	Required where a parking lot abuts a street frontage
Planting Requirements		
3.	Trees	Required every 30'0" on center where there is space for a buffer tree to be planted at the halfway point between street trees, on street side of fence when a fence is present.
4.	Ground Plane Vegetation	Buffers are required to be planted with live plants

		with at least 50% coverage at maturity, excluding trees.
Fencing (Optional)		
5.	Height	3'0" min. / 4'0" max.
6.	Location	2'0" offset from parking lot outer curb
7.	Opening	1 pedestrian opening allowed per street frontage, 4'0" minimum width.

Figure 8.01. Parking Lot Frontage Buffer Diagram



F. *Parking Lot Interior Landscape.*

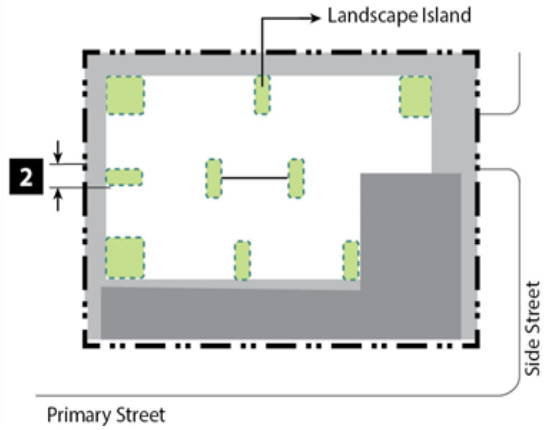
1. *Intent.* Landscaped areas within parking lots are designed to provide shade, minimize stormwater runoff, and improve the appearance of parking lots.

2. *Applicability.* All surface parking lots with fourteen or more parking spaces shall provide landscaping in accordance with the provisions of this section, with the exception of those areas within the surface parking lot that have a building or roof overhang that renders landscaping impracticable. Regulations for the parking lot interior landscape area type are defined in Table 8.07 and Figure 8.02.

Table 8.07. Parking Lot Interior Landscape Requirements

Landscape Island Requirements		
1.	Locations	1 island at the ends of each row/parking bay, including parking lot corner plus 1 island every 10 stalls in each row/bay.
2.	Width	5'0" min. width plus structural soil or soil cell area, 10'0" radius from tree center, required for trees planted in any island narrower than 15'0" wide.
Planting Requirements		
3.	Trees	1 large shade tree per island, min.
4.	Ground Plane Vegetation	Islands are required to be planted with live plants with at least 50% coverage at maturity, excluding trees.

Figure 8.02. Parking Lot Interior Landscaping Diagram



G. *Side and Rear Landscape Buffers.*

1. *Intent.* Landscaping along the rear and sides of a lot are designed to minimize negative impacts between adjacent developments and provide softening and screening between properties.

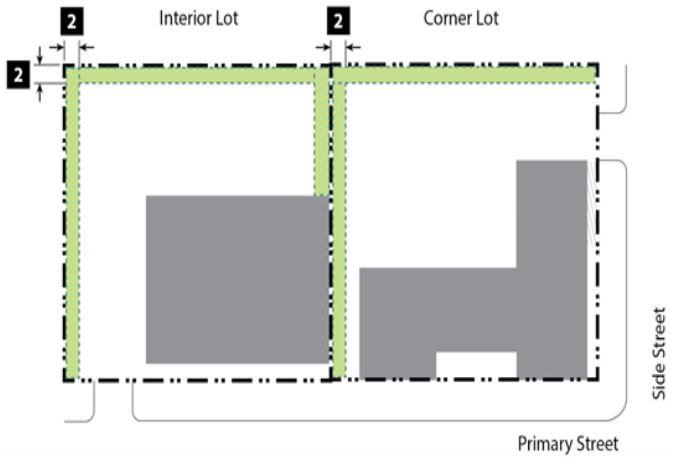
2. *Applicability.* These landscape buffers are required in all developments with ground floor nonresidential uses within the district and must include a fence or hedge, as described in Table 8.08. Approved shared parking lots are exempt from side and rear landscape buffer requirements when the parking lot straddles a side or rear lot line. Regulations for the side and rear landscape buffer landscape area type are defined in Table 8.08 and Figure 8.03.

Table 8.08. Side and Rear Landscape Buffer Requirements

Depth & Location		
1.	Locations	Required along side and rear lot lines (not along street frontages or across driveways)

2.	Depth	5'0" min.
Landscape Requirements		
3.	Trees	1 tree per 30'0" of side and rear lot lines where the provided landscape buffer is 10'0" wide or greater
4.	Hedge Option	A continuous double row of shrubs planted in the space between trees. Individual shrubs to have a minimum mature width of 3'0" and minimum mature height of 4'0" planted at no greater than 3'0" on center.
5.	Fence Option	An opaque fence with a minimum height of 6'0" to be installed adjacent to the lot line. The buffer on the interior side of the fence must include a sidewalk and/or be planted with live plants with at least 50% coverage at maturity, excluding trees.

Figure 8.03. Side and Rear Landscape Buffer Diagram



(Ord. 2022-15 § 1 (Att. A); Ord. 2021-08 § 1 (Att. A); Ord. 2020-04 § 1 (Att. A (part)))

17-7-11.9 Parking.

A. *General Requirements.*

1. *Intent.* These provisions are established to accomplish the following:

a. Ensure an appropriate level of vehicle parking, loading, and storage to support a variety of uses.

b. Provide appropriate site design standards to mitigate the impacts of parking lots on adjacent uses and form districts.

c. Provide specifications for vehicular site access.

2. *Applicability.* This section shall apply to all new development and changes in use or intensity of use for existing development, in any form district.

a. Compliance with these required standards outlined shall be triggered by the following circumstances:

i. Development of new parking facilities, loading facilities, and driveways.

ii. Improvements to existing parking facilities, loading facilities, and driveways, including reconfiguration, enlargement, or the addition of curbs, walkways, fencing, or landscape installation.

iii. Change in use requiring a change in the amount of parking.

b. *Damage or Destruction.* When a use that has been damaged or destroyed by fire, collapse, explosion, or other cause is reestablished, any associated off-street parking spaces or loading facilities shall be reestablished based on the requirements of this section.

c. *Site Plan Approval.* Parking quantities and parking design and layout shall be approved through the site plan approval process.

B. *Parking Requirements.*

1. *General Requirements for Parking.*

a. *Accessible Parking.* Parking facilities accessible for persons with disabilities shall be in compliance with or better than the standards detailed in the state accessibility code, including quantity, size, location, and accessibility.

b. *Approved Unlisted Uses.* Upon receiving a site plan approval, occupancy certificate, or other permit application for a use not specifically addressed in Section 17-7-11.3, the city is authorized to apply off-street parking standards specified for the use deemed most similar to the proposed use. In instances where an equivalent may not be clearly determined, the city may require the applicant to submit a parking study or other evidence that will help determine the appropriate requirements.

c. The minimum required on-site parking must be provided for the use of the owner or tenant of a dwelling unit in a mixed-use project or a multifamily dwelling and their guests at no additional cost beyond the base sale or lease price of the dwelling unit.

2. *Required Vehicular and Bicycle Parking.*

a. Table 9.01 contains the vehicular parking requirements and Table 9.02 outlines the bicycle parking requirements.

i. Parking requirements are organized by use and form district. Parking requirements are provided by use subcategory and form district; these numbers are applicable for all of the uses within each subcategory.

ii. The parking requirement columns in Table 9.01 indicate minimum and/or maximum required off-street parking ratios, which may be subject to credits and other reductions, as detailed in this section.

iii. Table 9.02 indicates the minimum bicycle parking ratio for each given use.

iv. *Computation.* Off-street parking spaces shall be calculated using the following information:

(A) *Area Measurements.* The following units of measurements shall be utilized to calculate parking requirements:

(1) *Dwelling/Rooming Unit.* Parking standards for residential uses shall be computed using dwelling unit, rooming unit, or room as the unit of measure, unless otherwise stated.

(2) *Net Leasable Floor Area.* Unless otherwise expressly stated, parking standards for nonresidential uses shall be computed using net leasable floor area as that term is defined in Section 17-2-14.

(3) *Occupancy- or Capacity-Based Measurements.* Parking spaces required per available seat or per employee, student, or occupant shall be based on the greatest number of persons on the largest shift, the maximum number of students enrolled, or the maximum fire-rated capacity, whichever measurement is applicable.

(4) *Bench Seating.* For uses in which users occupy benches, pews, or other similar seating facilities, each twenty-four inches of such seating shall be counted as one seat.

(B) *Fractions.* When computation of the number of required off-street vehicular parking spaces results in a fractional number, any result of one-half or more shall be rounded up to the next consecutive whole number. Any

fractional result of less than one-half may be rounded down to the previous consecutive whole number.

(C) When there are multiple uses on a lot, spaces shall be calculated as an amount equal to the combined requirements for all uses on the lot.

Table 9.01. Vehicular Parking Requirements by Use and Form District

Use Category		Requirement		Calculation Unit
		MS	TCC	
Residential & Lodging				
1.	Single-Family & Multi-Family (Studio/1-bedroom)	1.0 min. / 1.0 max.	1.0 min. / 1.0 max.	per dwelling unit
2.	Multi-Family (2-bedrooms)	1.0 min. / 1.5 max.	1.0 min. / 1.5 max.	per dwelling unit
3.	Multi-Family (3+-bedrooms)	1.0 min. / 2.0 max.	1.0 min. / 2.0 max.	per dwelling unit
4.	Hotel & Inn	1.0 max. + 1.0 max.	1.0 max. + 1.0 max.	per room + per 200 SF office & dining
5.	Residential Care	n/a	0.5 max. + 0.75 max.	per rooming unit + per employee
Civic & Institutional				
6.	Assembly (Public & Private)	0.2 max.	0.25 max.	per seat (capacity)
7.	Transit Station	TBD	TBD	per community development director

Use Category		Requirement		Calculation Unit
		MS	TCC	
8.	Medical / Dental Clinic	1.25 max. + 0.75 max.	1.5 max. + 1.0 max. per treatment room + per employee	
9.	Library / Museum / Post Office	0.75 max.	1.0 max.	per 600 SF
10.	Police & Fire	1.0 max	1.0 max	per 200 SF, not including equipment storage garages
11.	School: Pre-K through Junior High	1.0 max. + 0.75 max.	1.0 max. + 1.0 max.	per classroom + per 200 SF office space
12.	School: High School & Higher Education	1.0 max. + 0.75 max. + 0.15 max.	1.0 max. + 1.0 max. + 0.20 max.	per classroom + per 200 SF office space + per student
Retail				
13.	General Retail	1.0 max.	1.25 max.	per 300 SF
14.	Neighborhood Retail	0.75 max.	1.0 max.	per 300 SF
Service				
15.	General Service	0.5 max.	0.75 max.	per 250 SF
16.	Neighborhood Service	0.5 max.	0.75 max.	per 250 SF

Use Category		Requirement		Calculation Unit
		MS	TCC	
17.	Bars & Restaurants	0.5 max. + 0.75 max.	0.5 max. + 0.75 max.	per seat (capacity) + per employee
Office & Industrial				
18.	Office / Professional	1.0 max.	1.0 max.	per 200 SF
19.	Craftsman / Industrial	n/a	1.0 max. + 1.5 max.	per 500 SF retail space + per 1000 SF production space
Site Uses				
20.	Open Space	TBD	TBD	per community development director
n/a = use is not permitted in the given form district			TBD = to be determined by community development director	

Table 9.02. Bicycle Parking Requirements

Use Category or Type		*Minimum Required Bicycle Parking Spaces*
1.	Multi-Family	the greater of 4 spaces or 0.05 spaces per bedroom
2.	Civic & Institutional	2 spaces + 1 per 10,000 SF

Use Category or Type		*Minimum Required Bicycle Parking Spaces*
3.	Retail	2 spaces + 1 per 5,000 SF
4.	Service	2 spaces + 1 per 5,000 SF
5.	Office / Professional	2 spaces + 1 per 10,000 SF
6.	Open Space	per community development director

(Ord. 2022-09 § 1 (Att. K); Ord. 2021-08 § 1 (Att. A); Ord. 2020-04 § 1 (Att. A (part)))

17-7-11.10 Signage.

A. *General Requirements.*

1. *Intent.* This section seeks to enhance the economic and aesthetic appeal of the town center neighborhood through the reasonable, orderly, safe, and effective display of signage. Signage should contribute to the identity and brand of the town center.

2. *General Requirements.* Compliance with the regulations outlined shall be attained under the following situations:

a. *Newly Constructed or Reconstructed Signage.* All new signs and structural improvements to existing signs shall comply with these regulations.

b. *Change in Use for Single Business Signage.* For signage serving one business, whenever the existing use is changed to a new use requiring any change of signage content, the new sign and sign content shall comply with these regulations.

c. *Maximum Sign Area.* Unless otherwise specified, the total area of all permanent signage associated with any building shall be fifteen percent of the area of the primary building facade.

d. *Sign Quantity.* Indicates the number of signs permitted per building unit such as quantity per facade bay or a percentage of window square footage. Multiple sign types may be used on the same building when the sign quantity indicates one maximum per facade bay and indicates that the quantity is cumulative across sign types. Any mix of such sign types is permitted on a single building as long as the maximum quantity per facade bay is maintained for the entire building

e. *Sign Location.* Unless otherwise specified, signs shall only be located within the boundaries of the lot and not in the right-of-way or on public property.

i. Certain sign types may project beyond a property line into the right-of-way or into public property.

ii. No sign shall be attached to a utility pole, traffic pole, tree, standpipe, gutter, drain, or other vertical support structure that was not purposely built to support the sign.

iii. Signs shall be erected so as to permit free ingress to and egress from any door, window, the roof, or any other exit-way required by the building code or by fire department regulations.

iv. No sign shall be erected or maintained in such a manner as to obstruct free and clear vision of, interfere with, or be confused with any authorized traffic sign, signal, or device, or where it may interfere with vehicle or train line-of-sight.

v. Signs oriented to the pedestrian realm are required for each entryway on a public street. These signs should be mounted at a comfortable height and be clear and legible from the close range at which a pedestrian encounters the sign. The bottom edge of each sign should be no higher than nine feet from the ground plane and shall not exceed a total area of twenty-five square feet.

f. *Illumination.* All signs shall be illuminated according to the following provisions unless otherwise stated:

i. Signs shall be illuminated only by steady, stationary light sources directed solely at the sign or internal to it, except as permitted for electronic message boards for marquee signs.

ii. Individual letters or logos may be internally illuminated as permitted per each sign type; when this type of lighted lettering is used, no other portion of the sign shall be internally illuminated.

iii. Gas-discharge tube signage, commonly known as "neon signs," is not permitted, unless such neon element is used to (1) reproduce a historic sign that used to exist in the location along Main Street even if the historic building has been removed, or (2) replace an existing sign that is located on an existing historic structure along Main Street, or (3) create a new sign that is located on an existing historic structure along Main Street.

iv. Marquee signs, with either electronic or manually changed lettering, are permitted unless otherwise prohibited.

v. When an external artificial light source is used to illuminate a sign, the lamp (or bulb) shall be located, shielded, and oriented so as to not be visible from any public street or private residence.

(A) No receptacle or device housing a permitted light source which is attached to the sign itself shall extend more than one and one-half feet from the face of the sign.

(B) Sign lighting output shall count towards maximum light output allowed per property.

(C) Light must be directed downward with no light transmitted above horizontal plane of luminaire.

g. *Temporary Signs.* The following standards apply to temporary signage:

i. Each tenant may be allowed one temporary A-frame sign.

(A) Temporary signs are A-frame signs constructed of white plastic or wood and internally weighted are allowed.

(B) Signs shall be no greater than eight square feet per side. No other temporary signs are permitted.

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ii. Temporary signs shall be located in a bulb-out or park strip area (concrete or landscape).

iii. Temporary sign exposure is limited to three thirty-day periods per year.

iv. Temporary signs shall not count toward the requirements of any other sign type.

h. Double-sided signs are permitted with certain sign types. A double-sided sign has two sign faces of equal dimensions that are coplanar and face in opposite directions. When a double-sided sign is permitted, the sign area requirements apply to each side of the sign separately.

i. *Sign Type Requirements.* The following pertain to specific sign types detailed in this section:

j. Window signs shall not count toward the signage quantity and area or size requirements for any other sign type.

ji. *Signs Facing onto Parking Lots.* One parking lot facing sign is permitted in addition to the maximum requirements for other sign types.

(A) Permitted sign types for parking lot facing signs are wall, projecting, or awning signs.

(B) Maximum sign area is thirty square feet.

(C) Permitted location is either a side or rear facade that faces a parking lot.

(D) If such signs face existing single family homes, they may not be illuminated.

jii. *Iconic Signs.* Iconic signs may be allowed at the discretion of the city if the lighting of the sign does not significantly impact adjacent neighbors and the sign helps to identify the town center area. Such signs shall comply with the following:

(A) *Symbol or Logo Size.* The symbol or logo may not be larger than ten feet in any direction.

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i

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(B) The text component of the sign may not be more than seventy percent of the overall area of the sign.

iv. *Historic Signs.* Any existing signs that the city has identified as historic shall be included in the site plan approval process in order to encourage their preservation and/or reuse.

B. *Wall Signs.*

1. *Intent.* Wall signs, also known as flat, channel letter, or band signs, are mounted directly to the building face to which the sign is parallel. Refer to the figures below.

2. *Regulations.* Wall signs shall be developed according to the standards in Table 10.01.

a. Wall signs shall not cover windows or other building openings.

b. Wall signs shall not cover architectural building features and shall be architecturally compatible with the building.

c. Painted signs, a type of wall sign painted directly onto the building facade, are permitted.

d. *Nameplate signs indicate the name or occupation of the tenant.* They shall be subject to all of the requirements of the wall sign type but shall be no larger than three square feet maximum per tenant.

e. No wall signs shall be permitted on any facade facing an existing single family residential zone, except for iconic sign elements as approved by the city.

3. *Calculation.* The area of a wall sign is calculated using the following information:

a. For attached signs, area is calculated by drawing the smallest possible square or rectangle around the largest letters and/or elements, as illustrated in Figure 10.01.

b. For painted signs, area is calculated by measuring the area of the smallest square or rectangle that can be drawn around all of the sign elements, including any painted background.

Table 10.01. Wall Sign Requirements

Deleted: (B) No moving parts or external illumination of the symbol or logo may be provided.¶

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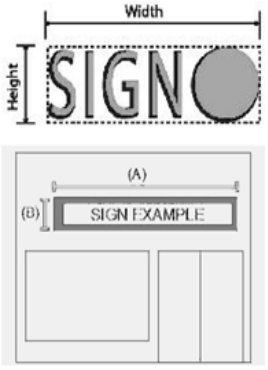
1.	Permitted Districts	MS, TCC
2.	Sign Area	2.0 SF of sign area per linear foot of facade bay width; 200 SF max. area per sign; 3.0 SF max. area per tenant for nameplate signs.
3.	Height	3' max letter or element height
4.	Location	Permitted on all facades
5.	Placement	1' max. projection from building face
6.	Quantity	1 max. per primary facade bay (cumulative across all permitted sign types)
7.	Internal Illumination	Permitted for individual letters and logos
8.	Materials	Solid wood, metal, masonry, and glass are permitted. Plastic and synthetics are permitted only as separate alphanumeric characters or logo elements. Vinyl banners or similar signs are not permitted.

Figure 10.01. Wall Sign Measuring Diagrams



C. *Awning Signs.*

1. *Intent.* A sign that is mounted, painted, or otherwise applied on or attached to an awning.

2. *Regulations.*

a. Awning signs shall be developed according to the standards in Table 10.02 and the encroachment regulations in Section 17-7-11.5.

3. *Calculation.*

a. The area of the awning is defined as the rectangular area of the building facade that is covered by the awning, i.e., awning height multiplied by awning width.

b. The sign area is a percentage of the surface area of the awning. The surface area is the total area of the sides and front of the awning, including both vertical and sloped or rounded parts of the awning.

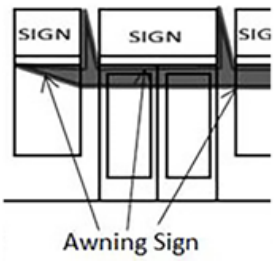
c. Sign area is calculated by drawing the smallest possible square or rectangle around the largest letters and/ or elements of the sign portion of the awning, as illustrated in the top image in Figure 10.01.

Table 10.02. Awning Sign Requirements

1.	Permitted Districts	MS, TCC
2.	Awning Area	3.0 SF of awning area per linear foot of primary facade bay width; 300 SF max. area per sign.
3.	Sign Area	Up to 50% of the awning surface may be used for signage.
4.	Height	8' min. vertical clearance above ground plane.
5.	Location	Permitted on all facades

6.	Placement	Maximum projection from the building facade is determined by street frontage type. Awnings shall not project within 2' from the back of curb and shall not overlap, block, or cover any window, door, or roof.
7.	Quantity	1 max. per primary facade bay (cumulative across all permitted sign types)
8.	Internal Illumination	Not permitted
9.	Materials	Awning surface shall be made of canvas, metal, glass, or wood. Plastic is not permitted. All structural supports shall be made of metal or wood.

Figure 10.02. Awning Sign Example



D. *Hanging/Projecting Signs.*

1. *Intent.* A projecting sign is attached to and projects from a building face or hangs from a support structure that projects from the building face. Sign faces are typically perpendicular to the building face but may be angled away from the facade no less than forty-five degrees. The sign may be vertically or horizontally oriented.

2. *Regulations.*

a. Projecting signs shall be developed according to the standards in Table 10.03.

b. Double-sided signs are permitted.

c. No projecting signs shall be permitted on any facade facing an existing single family residential zone, except for iconic sign elements as approved by the city.

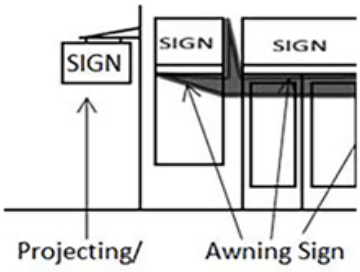
d. Backlit box or cabinet signs are not permitted.

Table 10.03. Hanging/Projecting Sign Requirements

1.	Permitted Districts	MS, TCC
2.	Sign Area	1.5 SF of sign area per linear foot of facade bay width; 160 SF max. area per sign face
3.	Total Size	8' max. width by 20' max. height, including sign face(s) and all support structures
4.	Location	Permitted on all facades facing a public right-of-way
5.	Placement	10' min. clearance above the ground plane. Hanging/projecting signs shall not project further than 8' from the building face and shall not project within 2' from the back of curb. Sign faces and structural supports shall not extend above any eave or parapet.
6.	Quantity	1 max. per primary facade bay (cumulative across all permitted sign types)
7.	Internal Illumination	Permitted for individual letters and logos
8.	Materials	Solid wood, metal, masonry, and glass are permitted. Plastic and synthetics are permitted only as separate alphanumeric characters or logo elements. All structural supports shall be made of

		metal or wood.

Figure 10.03. Projecting Sign Example



E. *Monument Signs.*

1. *Intent.* A monument sign is freestanding and located in a front or side yard of a lot.

2. *Regulations.*

a. Monument signs shall be developed according to the standards in Table 10.04.

b. Multiple tenant buildings on a lot with a width of greater than three hundred feet, measured across the front property line, may have signage with the following parameters:

i. Up to two monument signs on one frontage.

ii. Signs shall be at least one hundred fifty feet apart.

iii. Monument signs may not be pole mounted.

iv. Manually changeable text is not permitted for monument signs.

v. May serve multiple purposes such as seating.

vi. If placed closer than five feet from the front and corner side property lines, signs must meet clear view requirements.

vii. Double-sided signs are permitted.

c. Buildings on a lot with a width of greater than six hundred feet, measured across a primary frontage, may have signage with the following parameters along such frontage:

i. Up to nine feet tall and a maximum area of seventy-five square feet per sign face.

ii. Up to two monument signs on one frontage.

iii. Signs shall be at least three hundred feet apart.

iv. Monument signs may not be pole mounted.

v. Manually changeable text is not permitted for monument signs.

vi. May serve multiple purposes, such as seating.

vii. If placed closer than five feet from the front and corner side property lines, signs must meet clear view requirements.

viii. Double-sided signs are permitted.

Table 10.04. Monument Sign Requirements

1.	Permitted Districts	TCC
2.	Sign Area	50 SF max. area per sign face.
3.	Total Size	6' height by 10' width by 3' depth, including sign face(s) and all support structures.
4.	Location	Primary street and side street BTZ.
5.	Placement	1 max. per street frontage. When placed at the intersection of two street frontages, the sign shall not obstruct the sight distance triangle.

6.	Quantity	1 max. per street frontage.
7.	Internal Illumination	Permitted for individual letters and logos
8.	Materials	Solid wood, metal, masonry, and glass are permitted. Plastic and synthetics are permitted only as separate alphanumeric characters or logo elements. All structural supports shall be made of metal or wood.

Figure 10.04. Monument Sign Example

F. *Freestanding Post Signs.*

1. *Intent.* Freestanding post signs are pedestrian-scale signage and may be mounted on one or two poles. Three configurations are permitted:

   a. A sign mounted onto a double set of poles.

   b. A sign mounted on a single pole.

   c. A sign hanging from a single pole.

2. *Regulations.*

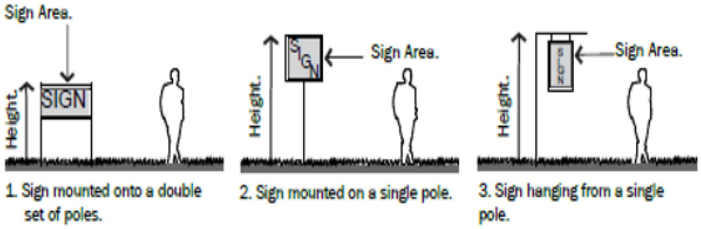
   a. Freestanding post signs shall be developed according to the standards in Table 10.05.

   b. Double-sided signs are permitted..

Table 10.05. Freestanding Post Sign Requirements

1.	Permitted Districts	MS, TCC
2.	Sign Area	8 SF max. area per sign face
3.	Height	8' max. for signs mounted or hanging on a single pole; 5' max. for signs mounted on a double set of poles.
4.	Pole Size	4'' by 4'' max. pole cross-section
5.	Location	Primary street and side street BTZ
6.	Placement	Pole setback 2' min. from right-of-way property lines; property line overhangs are not permitted.
7.	Quantity	1 max. per primary facade bay (cumulative across all permitted sign types)
8.	Internal Illumination	Not permitted
9.	Materials	Solid wood, metal, masonry, and glass are permitted. Plastic and synthetics are permitted only as separate alphanumeric characters or logo elements. All structural supports shall be made of metal or wood.

Figure 10.05. Freestanding Post Sign Examples



G. *Window Signs.*

1. *Intent.* A window sign is posted, painted, placed, or affixed to or near the interior surface of a window for public viewing on the exterior of the window. Window signs should be durable and adhered permanently to the interior surface.

2. *Regulations.*

a. Window signs shall be developed according to the standards in Table 10.06.

3. *Calculation.*

a. The total window area is a sum of the areas of individual windows and glass doors. A "continuous set" of windows is a group of one or more windows or glass doors that are separated by mullions or frames less than eight inches in width.

b. To measure sign area percentage, divide the total sign area by the total window area.

c. Window signs are not counted toward a site's maximum signage allowance.

d. Address and hours of operation signs are considered exempt and are not counted in the window sign area calculation.

e. Temporary window signs shall be included in the total percentage of signage per window calculation.

f. Window signs may not be internally illuminated. Neon (gas-discharge tube), LED screens and shapes, marquee signs, and other similar illuminated signs are not permitted.

Table 10.06. Window Sign Requirements

1.	Permitted Districts	MS, TCC
2.	Sign Area	Maximum signage coverage for any continuous set of windows is 25%. Maximum signage coverage for

		any individual window is 40%.
3.	Height	No max. or min.
4.	Location	Permitted on all facades
5.	Placement	Permitted on ground and upper-story windows where not occupied by a residential use. Window signs shall not obstruct the visibility from employee stations outside the building or of law enforcement personnel into the business.
6.	Quantity	Ground story: no maximum, determined by sign area. Upper stories: 1 individual window or continuous set of windows per tenant per floor.
7.	Internal Illumination	Not permitted
8.	Materials	Paint, wood, glass, plastic, metal, and other similar materials are permitted.

(Ord. 2022-15 § 1 (Att. A); Ord. 2021-08 § 1 (Att. A); Ord. 2020-04 § 1 (Att. A (part)))

17-7-11.11 Administration.

A. *General Requirements.*

1. *Intent.* This chapter intends to promote public health, safety, and general welfare of the community, reflecting the goals established within the general plan of Midvale City and the Main Street small area plan. This chapter intends to increase conformity to the greatest extent possible.

B. *Scope of Regulations.*

1. *New Development.* All development, construction, and establishment of uses within the limits of this chapter occurring after the effective date of this chapter shall be subject to all applicable regulations of this chapter.

2. *Renovated Structures.* All building renovations affecting a change of use greater than twenty-five percent gross square footage of a structure within the limits of this chapter shall be subject to all applicable regulations of this chapter.

3. *In-Process Development.* Where a building permit for a development has been applied for in accordance with the prior law in advance of the effective date of this chapter, said development may comply with the plans from which the permit was approved and, upon completion, receive a certificate of occupancy (provided all conditions are met) provided the following requirements are satisfied:

a. Work or construction is begun within one year of the effective date of this chapter; and

b. Work or construction continues diligently toward completion.

4. *Nonconformance.* After the effective date of this chapter, existing buildings and uses that do not comply with the regulations of this chapter shall be considered nonconforming and are subject to the standards of this chapter.

a. *General Provisions.*

i. *Permissions.*

(A) Any nonconforming lot, use, structure, or sign that was lawfully established before the FBC was implemented may continue as long as the nonconformity remains legal and complies with all other FBC nonconformity requirements.

ii. *Administration.*

(A) Any rights conferred on a nonconformity remain with the property and are not affected by changes in tenancy or ownership.

(B) The burden of establishing the existence of a conformity prior to the FBC implementation is on the applicant.

(C) Determinations about the existence of a legal nonconformity shall be made by the community development director.

iii. *Limitations.*

(A) Any lot, use, structure, or sign that was illegal prior to implementation of the form-based code remains illegal if it does not conform to the form-based code.

(B) Nonconformity regulations apply to all projects that were submitted for approval before implementation of the form-based code. All projects submitted after implementation of the form-based code shall meet the requirements of the form-based code.

(C) If any portion of the form-based code is judged invalid by a jurisdictional court, that judgement shall not affect the remaining portions of the form-based code.

iv. *Uses.*

(A) *Permissions.*

(1) An existing nonconforming use may be extended to the entire floor area of the building it is located in.

(2) Structures containing nonconforming uses may be altered according to the requirements of the form-based code.

(3) If a structure containing a nonconforming use is damaged or destroyed, the nonconforming use may be reestablished at the same scale as it operated prior to the destructive event.

(B) *Limitations.*

(1) Nonconforming uses may be expanded to additional parcels provided, however, the building into which the use expands otherwise fully complies with the form-based code.

(2) An existing nonconforming use may not be changed to a different nonconforming use.

(3) If a nonconforming use is abandoned, any future use shall be a conforming use. When a nonconforming use transitions to a conforming use, it shall not be changed back to any nonconforming use.

v. *Structures.*

(A) *Permissions.*

(1) Nonconforming structures may be altered if the alteration is required by law to restore the structure to a safe condition.

(2) Nonconforming structures may be altered if the alteration:

(a) Is routine repair or maintenance;

(b) Eliminates a nonconformity;

(c) Does not expand an existing nonconformity; or

(d) Does not create a new nonconformity.

(3) Nonconforming structures and parking lots may be expanded if the expansion is conforming or increases the overall conformity of the property.

(4) In the event of damage or destruction to a nonconforming structure which is damaged or destroyed by fire, earthquake, or other calamity beyond the control of the owner, the building may be reconstructed or repaired to the conditions which existed prior to the casualty, provided the structure or structures existed as legally established structures. All such construction or repairs shall be started within twelve months from the date of damage and shall be diligently pursued to completion.

(5) Existing nonconforming structure facades may be altered if the modifications do not increase the amount of nonconformity.

(B) *Limitations.*

(1) If a nonconforming structure is damaged or destroyed, all permits for rebuilding, restoration, or repair must be granted within one year of the

damage or destruction. If the applicant requests an extension, the community development director may grant no more than one extension, not to exceed one year in length.

(2) If a nonconforming structure is relocated, the structure shall fully comply with the current zoning regulations of the parcel to which it is moved.

(3) If all required permits for the rebuilding, restoration, or repair of a damaged or destroyed nonconforming structure are not granted within one year of the damage or destruction, and no extension period is granted, the structure may be rebuilt, restored, or repaired only if it conforms to the requirements of the form-based code.

5. *Exempt Activities.* The activities within this section are exempt from the requirements of this chapter. Building permits may still be required under the building code for actions taken in accordance with this section.

a. Ordinary repairs for the purpose of regular building, signage, lighting or site maintenance.

b. Replacement of existing windows, doors, or fixtures that do not change the transparency percentage of the building.

c. Interior construction that does not result in change of use and is not visible from the exterior of the building.

d. Emergency repairs ordered by any city official in order to protect health and safety.

6. *Appeals.*

a. All city decisions which interpret or administer this chapter may be appealed to the planning commission within ten days of final action by filing notice of appeal with the community and economic development department.

b. Following final action by the planning commission, any person with standing to challenge the decision may, within ten days of the final action, appeal the decision to the appeal authority following the process defined in Section 17-3-14.

7. Any state or federal regulations that apply within the form-based code area, and are in conflict with form-based code regulations, shall supersede the form-based code regulations.

C. *Minor Modifications to a Site Plan.* The community development director may approve minor modifications to an approved site plan. Modifications may be evaluated through a letter of application and the provision of the reasoning behind the request. Such requests may be made for:

1. Minor modifications to proposed landscaping plans, pursuant to the modification standards established.

2. Minor modifications to buildings, including setbacks and materials, pursuant to the modification standards.

a. Building materials that reflect the intent of the original material.

b. The city may modify the requirements of this chapter where full compliance is impossible due to the existing site or building conditions.

3. Minor modifications to parking requirements, pursuant to the development of an alternative parking plan. (Ord. 2020-04 § 1 (Att. A (part)))

17-7-11.12 Definitions.

A. The meaning and usage of terminology is not universal. Some of the terms in this FBC are used differently in other contexts. The definitions provided in this FBC are specific to how they are used within the FBC. These definitions are not subject to multiple interpretations and shall not be altered. When a definition is not provided herein, Chapter 17-2 shall be used.

B. *Graphics.* The graphics, tables, and text utilized throughout this code are regulatory. In case of a conflict, text shall control over tables and graphics and tables shall control graphics.

C. *Defined Terms.*

1. *"A" Definitions.*

a. "Animal" means all nonhuman members of the animal kingdom, including domestic and livestock species.

b. "Assembly" means a facility that has organized services, meetings, or programs to benefit, educate, entertain, or promote discourse amongst the residents of the community in a public or private setting. "Assembly" includes such uses as a community center, house of worship, and private clubs and lodges.

c. "Auto-related use" means an establishment primarily engaged in the sale or rental of goods, merchandise, and services related to vehicles, such as repair, body work, painting, detailing, vehicle and vehicle-related equipment sales.

2. *"B" Definitions.*

a. "Bicycle rack" means a device to which bicycles can be securely attached for parking purposes. A bike rack may be freestanding or it may be securely attached to the ground or some stationary object such as a building. Each rack must provide space for two or more bicycles to be secured.

b. "Blank wall limitation" means a restriction on the amount of windowless area permitted on a facade that fronts a street. When required, the following shall be met for each story:

i. No rectangular area greater than thirty percent of a story's facade, as measured floor to floor, may be windowless.

ii. No rectangular segment of a story's facade with a horizontal width greater than fifteen feet may be windowless.

c. "Block depth" means a block measurement that is the horizontal distance between the front property line on a block face and the front property line of the parallel or approximately parallel block face.

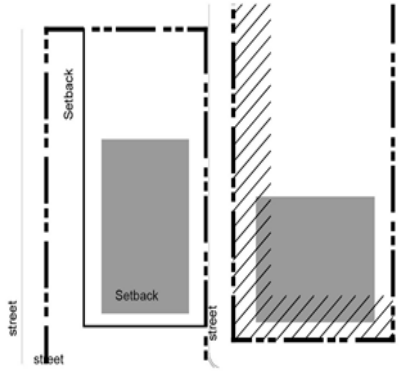
d. "Block ends" means the lots located on the end of a block; these lots are often larger than the lots in the interior of the block or those at the opposite end of the block and can be located on a more intense street type. They are typically more suitable for more intensive development, such as multiple family or mixed-use development.

e. "Block face" means the aggregate of all the building facades on one side of a block.

f. "Block length" means a block measurement that is the horizontal distance along the front property lines of the lots comprising the block.

g. "Build-to-zone" means an area in which the front or corner side facade of a building shall be placed; it may or may not be located directly adjacent to a property line. The zone dictates the minimum and maximum distance a structure may be placed from a property line. Refer to Figure 12.01.

Figure 12.01. Setback Line vs. Build-to Zone



h. "Building type" means a structure defined by the combination of configuration, form, and function. Refer to 17-7-11.6, Building Types, for more information and the list of permitted building types.

3. *"C" Definitions.*

a. "Clinic" means a building or portion of a building containing an office or offices of medical doctors, dentists, psychiatrists, chiropractors, physical therapists and other members of the medical profession which provides facilities and services for outpatient care, diagnosis, treatment, and observation of individuals suffering from illness, injury or other conditions requiring medical, surgical or therapeutic services. This definition does not include facilities providing patient beds for overnight care.

b. "Courtyard" means an outdoor area enclosed by a building on at least two sides and open to the sky.

c. "Coverage, building" means the percentage of a lot developed with a principal or accessory structure.

d. "Coverage, impervious site" means the percentage of a lot developed with principal or accessory structures and impervious surfaces, such as driveways, sidewalks, and patios.

e. *Craftsman Use.* See "Industrial/craftsman use."

4. *"D" Definitions.*

a. "Dedication" means the intentional appropriation of land by the owner to the city for public use and/or ownership.

b. "Dwelling unit" means a room or group of rooms connected together that includes facilities for living, sleeping, cooking, and eating that are arranged, designed, or intended to be used as living quarters for one family, whether owner occupied, rented, or leased.

5. *"E" Definitions.*

a. "Eave" means the edge of a pitched roof; it typically overhangs beyond the side of a building.

b. "Entrance type" means the permitted treatment types of the ground floor facade of a building type. Refer to Section 17-7-11.6 for more information and a list of permitted entrance types.

c. "Expression line" means an architectural feature. A decorative, three-dimensional, linear element, horizontal or vertical, protruding or indented at least two inches from the exterior facade of a building typically utilized to delineate floors or stories of a building.

6. *"F" Definitions.*

a. "Facade" means the exterior face of a building, including but not limited to the wall, windows, windowsills, doorways, and design elements such as expression lines. The front facade is any building face adjacent to the front property line.

b. "Facade bay fenestration features" means a set of design features that are required in addition to minor division features. Table 12.01 lists the options for facade bay fenestration features. The minimum number of features that must be used to define adjacent bays is listed in each building type requirements table.

Table 12.01. Facade Bay Fenestration Features

Window casing/cornice/sill
Window size
Window shape
Quantity of windows
Window spacing/configuration
Projection/Recession of details
Balcony size/spacing/configuration
Awning size/spacing/configuration

c. *Fire.* See "Police and fire."

d. "Form district" means a designation given to each lot within the city that dictates the standards for development on that lot. Refer to Section 17-7-11.2, Form districts, for more information and a list of permitted form districts.

7. *"G" Definitions.*

a. "Gross floor area" means the sum of all areas of a building, including accessory storage areas or closets within sales spaces, working spaces, or living spaces, and any basement floor area used for retailing activities, the production or processing or goods, or business offices. It shall not include attic space having headroom of seven feet or less and areas devoted primarily to storage, balconies, off-street parking and

loading areas, enclosed porches, roof decks, roof gardens, or basement floor area other than specified above.

8. *"H" Definitions.*

a. "Hotel" and "inn" mean a facility offering temporary or permanent lodging to the general public consisting of sleeping rooms with or without in-room kitchen facilities. Secondary service uses may also be provided, such as restaurants and meeting rooms. Rooms shall be accessed from the interior of the building. Bed and breakfasts are permitted.

9. *"I" Definitions.*

a. "Industrial/craftsman use" means a use involving small-scale manufacturing, production, assembly, and/or repair, with little to no noxious by-products, that includes a showroom or small retail outlet. These uses may also include associated facilities such as offices and small-scale warehousing, but distribution is limited. The maximum overall gross floor area is limited to twenty thousand square feet, unless otherwise noted. Outdoor activities and storage of goods are not permitted.

10. *"J" Definitions.*

11. *"K" Definitions.*

12. *"L" Definitions.*

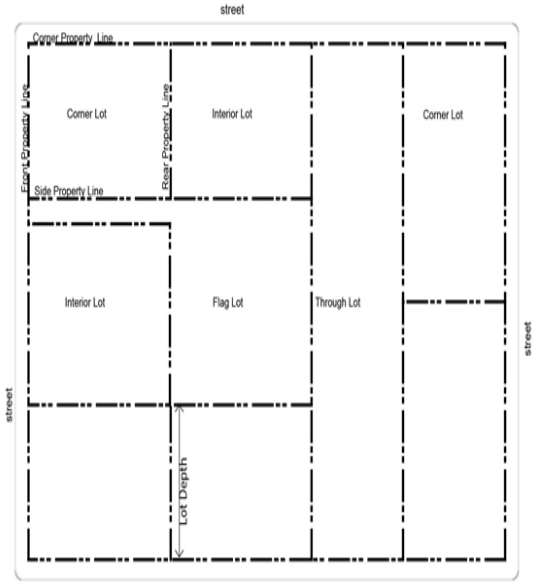
a. "Landscape area" means area on a lot not dedicated to a structure, parking or loading facility, frontage buffer, side and rear buffer, or interior parking lot landscaping.

b. *Library/Museum/Post Office.* Libraries and museums are open to the general public for housing educational, cultural, artistic, or historic information, resources, and exhibits. May also include food service and a gift shop. A post office is a publicly accessed facility for the selling of supplies and mail-related products and the small-scale collection and distribution of mail and packages. Large-scale postal sorting and distribution is not permitted.

c. "Lot," also referred to as "parcel," means a plot of land intended to be separately owned, developed, or otherwise used as a unit. A lot may consist of one or many

parcels. Most of the regulations in this FBC apply to the lot rather than the parcel. Refer to Figure 12.02, Lots. Projects that are developed in phases shall be considered one lot if only one permitting application process is required and two or more lots if two or more permitting application processes are required.

Figure 12.02. Lots



d. "Lot, corner" means a parcel of land abutting at least two vehicular rights-of-way, excluding an alley, at their intersection. Refer to Figure 12.02, Lots.

e. "Lot, flag" means a parcel of land having its only access to the adjacent vehicular right-of-way, excluding an alley, through a narrow strip of land. Refer to Figure 12.02, Lots.

f. "Lot, interior" means a parcel of land abutting a vehicular right-of-way, excluding an alley, along one property line, surrounded by lots along the remaining property lines. Refer to Figure 12.02, Lots.

g. "Lot, through," also referred to as a "double frontage lot," means an interior lot having frontage on two approximately parallel vehicular rights-of-way, excluding an alley. Refer to Figure 12.02, Lots.

h. "Lot area" means the computed area contained within the property lines; it is typically denoted in square feet or acres. Refer to Figure 12.02, Lots.

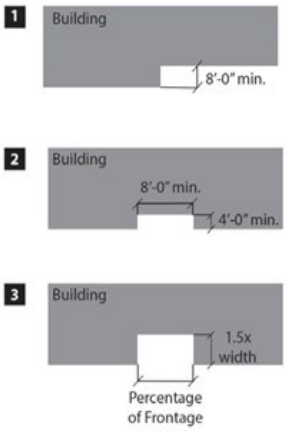
i. "Lot depth" means the smallest horizontal distance between the front and rear property lines measured approximately parallel to the corner and/or side property line. Refer to Figure 12.02, Lots.

j. "Lot frontage" means the horizontal distance between the side property lines, measured at the front property lines. Refer to Figure 12.02, Lots.

13. *"M" Definitions.*

a. "Major division" means required divisions on longer buildings and identified by a dividing feature. Long facades may require more than one major division. Each major division consists of two or more minor divisions. All major divisions must be indicated by one of the divider features illustrated in Figure 12.03. The outside edges of a primary facade are the equivalent of a major divider. The minimum and maximum width of the major division is listed in feet in each building type requirements table.

Figure 12.03. Major Facade Division Diagrams



b. "Major division features" means architectural elements that must differ between adjacent major divisions. Table 12.02 lists the options for major division features. The minimum number of features that must be used to define adjacent bays is listed in each building type requirement table.

Table 12.02. Major Division Features

Facade setback change: 8'0" depth min.
Recessed area: 4'0" deep by 8'0" wide min.
Primary facade courtyard

c. "Medical/dental clinic" means a facility or institution, whether public or private, principally engaged in providing services for health maintenance and the treatment of mental or physical conditions.

d. "Minor division" means required divisions within each major division. Each minor division defines an individual bay in the building's facade. The minimum and maximum width of the minor division is listed in feet in each building type requirement table.

e. "Minor division features" means architectural elements that must differ between adjacent minor divisions or are used to divide adjacent bays. Table 12.03 lists the options for minor division/divider features. The minimum number of features that must be used to define adjacent bays is listed in each building type requirement table.

Table 12.03. Minor Division Features

Facade setback: 2'0" min.
Recessed area: 2'0" deep by 4'0" wide min.
Material

Color
Roofline*
Vertical Linear Element
Entrance Type
Number of Stories
Any Major Division Feature

***** Roofline variations include parapet wall height, roof overhang distance, flat roof eave thickness, fascia, cornice, corbel, and other details. Multiple roofline variations count as one minor division feature.

f. *Museum.* See "Library/Museum/Post Office."

14. *"N" Definitions.*

a. "Nonconformance" means a structure, use, lot, or site characteristic that was legally constructed or operated prior to the effective date of or amendment to this chapter, but that cannot be constructed, platted, or operated after the effective date of or amendment to this chapter.

15. *"O" Definitions.*

a. "Occupied space" means interior building space regularly occupied by the building users. It does not include storage areas, utility space, or parking.

b. "Office/professional" means a category of uses for businesses that involve the transaction of affairs of a profession, service, industry, or government.

Deleted: Patrons of these businesses usually have set appointments or meeting times; the businesses do not typically rely on walk-in customers....

c. "Open space" means a use of land for active or passive, public or private, outdoor space, including such uses as parks and town squares. See Section 17-7-11.7. Open space uses may also be utilized to host temporary private or community events, such as a farmer's market or art fair. Parking lots are not permitted in open space in any

district. Open space that incorporates stormwater management on a site or district scale is encouraged. Stormwater facilities shall be designed to accommodate additional uses, such as an amphitheater or a sports field. Stormwater facilities shall be designed not to be fenced and shall not impede public use of the land they occupy. An open space may include small-scale food and beverage service use, no more than two hundred square feet in space, located in a kiosk, with no service access. Buildings located directly adjacent to an open space use shall treat facades facing this use with primary street facade requirements.

d. *Open Space, Minimum Access.* This requirement ensures access and visibility for the open space. It is described in two ways:

i. The percentage of the total perimeter that must be adjacent to a public right-of-way.

ii. The minimum number of and/or spacing between access points into the open space.

e. "Open space type" means the permitted and regulated types of open spaces in this code. Refer to Section 17-7-11.7, Open Space, for more information and a list of the permitted types.

f. "Open water" means a pond, lake, reservoir, or other water feature with the water surface fully exposed.

16. *"P" Definitions.*

a. "Parcel" means a tract of land that is specifically defined in legal terms for both taxation and ownership purposes. It is the smallest portion of land that may be defined in this way.

b. "Parking structure, attached" means a structure used solely for the parking of vehicles, intended for use by the occupants in an adjacent building on the same lot. Parking structures within the buildings are regulated per building type.

c. "Parking structure, detached" means a shared parking structure owned by the city, a parking district, a government agency, or other public entity intended to accommodate public and leased parking.

d. "Pedestrianway" means a pathway designed for use by pedestrians; it can be located mid-block allowing pedestrian movement from one street to another without traveling along the block's perimeter.

e. "Pervious surface," also referred to as "pervious material," means surface or material that allows for the absorption of water into the ground or plant material, such as permeable pavers or a vegetated roof.

f. "Police and fire" means facilities providing public safety and emergency services; training facilities, locker rooms, and limited overnight accommodations may also be included.

g. *Post Office.* See "Library/Museum/Post Office."

h. "Primary facade courtyard" means a pedestrian-only space that extends from the sidewalk into a lot beyond the BTZ setback. Primary facade courtyards are subject to the following standards:

i. Must be freely accessible to the public.

ii. May not be enclosed with any overhead roof structure or building mass. Shade structures are permitted.

iii. May only be occupied by pedestrian uses. No full-time, part-time, temporary, or permanent vehicular uses are permitted.

iv. Must meet minimum width as defined by building type.

v. Must be no deeper than one and one-half times the width of the courtyard.

vi. For interior lots, must have a minimum fifteen feet of fully extended facade on either side of the courtyard.

vii. For corner lots, must be placed at the corner where the two rights-of-way intersect. Courtyard width shall be measured along primary street frontage.

i. "Primary street" means a street designated in the form-based code that receives priority over other streets in terms of setting front property lines and locating building entrances.

j. *Professional.* See "Office/professional."

k. "Property line," also referred to as "lot line," means a boundary line of a parcel of land or lot. Refer to Figure 12.02, Lots.

l. "Property line, corner" means a boundary of a lot that is approximately perpendicular to the front property line and is directly adjacent to a public right-of-way, other than an alley or railroad. Refer to Figure 12.02, Lots.

m. "Property line, front" means the boundary abutting a right-of-way, other than an alley, from which the required setback or build-to zone is measured, with the following exceptions:

i. Corner and through lots that abut a primary street shall have the front property line on that primary street.

ii. Corner and through lots that abut two primary streets or do not abut a primary street shall utilize the orientation of the two directly adjacent lots or shall have the front property line determined by the community development director.

n. "Property line, rear" means the boundary of a lot that is approximately parallel to the front property line; this line separates lots from one another or separates a lot from an alley. Refer to Figure 12.02, Lots.

o. "Property line, side" means the boundary of a lot that is approximately perpendicular to the front and rear property lines; it is not adjacent to the public right-of-way. Refer to Figure 12.02, Lots.

17. *"Q" Definitions.*

18. *"R" Definitions.*

a. "Residential" means facilities in which people reside. Often called "housing," this includes several different building types and configurations of dwelling units meant for individuals and groups of people, such as a family. Units are typically occupied for long periods of time and may be leased or owner-occupied.

b. "Residential care" means a facility offering temporary or permanent lodging to the general public consisting of an unlimited number of sleeping rooms with or without in-

room kitchen facilities. “Residential care” includes such uses as independent and assisted living facilities, nursing homes, and residential care homes. Assistance with daily activities may be provided for residents. Secondary service uses may also be provided, such as restaurants and meeting rooms. Rooms shall be accessed from the interior of the building.

c. “Retail, general” means retail uses occupying a space larger than twelve thousand square feet, and engaged in selling goods or merchandise to the general public for personal or household consumption and rendering services incidental to the sale of such goods, including, but not limited to, convenience stores, department stores, grocery stores, hobby shops, etc.

d. “Retail, neighborhood” means retail uses occupying a space smaller than twelve thousand square feet, and engaged in selling goods or merchandise to the general public for personal or household consumption and rendering services incidental to the sale of such goods, including, but not limited to, convenience stores, department stores, grocery stores, hobby shops, etc.

e. “Right-of-way” means land dedicated or utilized for a street type, trail, pedestrianway, utility, railroad, or other similar purpose.

f. “Roof type” means the detail at the top of a building that finishes a facade, including a pitched roof with various permitted slopes and a parapet. Refer to Section 17-7-11.6 for more information and a list of the permitted roof types.

19. *“S” Definitions.*

a. “Scale” means the relative size of a building, street, sign, or other element of the built environment.

b. “School” means an education facility with classrooms and offices, that may also include associated indoor facilities such as ball courts, gymnasium, theater, and food service.

c. “Service, general” means service uses occupying a space larger than twelve thousand square feet and are primarily engaged in providing assistance, as opposed to products, to individuals, business, industry, government, and other enterprises,

including, but not limited to, entertainment uses, repair of small goods and electronics (not including vehicles), home furniture, restaurants, etc.

d. "Service, neighborhood" means service uses occupying a space smaller than twelve thousand square feet, are primarily engaged in providing assistance, as opposed to products, to individuals, business, industry, government, and other enterprises, including, but not limited to, entertainment uses, repair of small goods and electronics (not including vehicles), home furniture, restaurants, etc. Multiple neighborhood service uses can be aggregated in one development.

e. "Semi-pervious surface," also referred to as "semi-pervious material," means material that allows for at least forty percent absorption of water into the ground or plant material, such as pervious pavers, permeable asphalt and concrete, or gravel.

f. "Setback" means the horizontal distance from a property line inward, beyond which a structure may be placed. Structures or other impervious surfaces are not permitted within a setback, unless specifically permitted in this code. Refer to Figure 12.01.

g. "Sexually oriented business" means nude entertainment businesses, sexually oriented outcall services, adult businesses, seminude dancing bars and seminude dancing agencies.

h. "Sign" means an object, device, or structure used to advertise, identify, display, direct, or attract attention to an object, person, institution, organization, business, product, service, event, or location by such means as words, letters, figures, images, designs, symbols, or colors. Flags or emblems of any nation, state, city, or organization; works of art which in no way identify a product; and athletic field score boards are not considered signs.

i. "Solar reflectance index (SRI)" means a measure of a constructed surface's ability to reflect solar heat, as shown by a small temperature rise. The measure utilizes a scale from zero to one hundred and is defined so that a standard black surface is zero and a standard white surface is one hundred. To calculate for a given material, obtain the reflectance value and emittance value for the material; calculate the SRI according to ASTM E 1980-01 or the latest version.

j. "Story" means a habitable level within a building measured from finished floor to finished floor.

k. "Story, ground," also referred to as "ground floor," means the first floor of a building that is level to or elevated above the finished grade on the front and corner facades, excluding basements or cellars.

l. "Story, half" means a story either in the base of the building, partially below grade and partially above grade, or a story fully within the roof structure with transparency facing the street.

m. "Story, upper," also referred to as "upper floor," means the floors located above the ground story of a building.

n. "Street face" means the facade of a building that faces a public right-of-way.

o. "Street frontage," also referred to as "lot frontage," means the portion of a building or lot directly adjacent to a vehicular right-of-way.

p. "Street type" means the permitted and regulated types of streets in this code. Refer to Section 17-7-11.4, Street types, for more information and a list of the permitted street types.

q. "Streetwall" means the vertical plane created by building facades along a street. A continuous streetwall occurs when buildings are located in a row next to the sidewalk without vacant lots or significant setbacks.

r. "Structure, accessory" means the general term for a subordinate structure detached from but located on the same lot as the principal structure; it may or may not be inhabitable.

s. "Structure, principal," also referred to as the "principal building," means a building that contains the dominant use of the lot. It is typically located toward the front of the lot in the front build-to zone or behind the front yard setback.

t. "Swale" means a low-lying, naturally planted area with gradual slopes that facilitate the transport, absorption, and/or filtration of stormwater.

20. *"T" Definitions.*

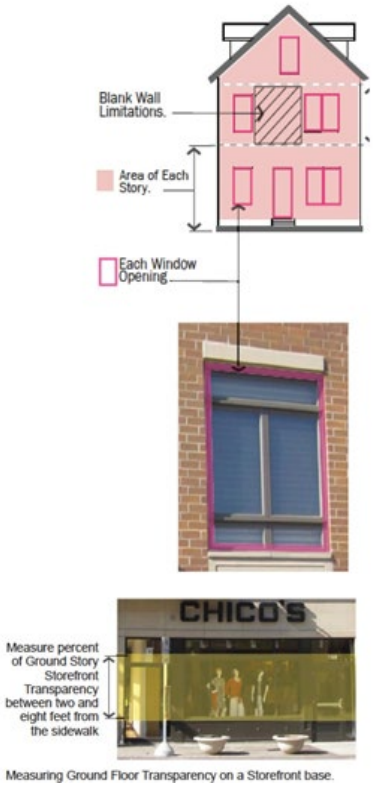
a. "Transit station" means a covered passenger boarding and alighting facility for a bus or other transit mode.

b. *Transparency, Minimum Ground Story and Upper Floor.* Refer to Figure 12.04, Measuring Transparency. The minimum amount of transparency required on street facades with street frontage. "Transparency" is any glass in windows and/or doors, including any mullions, that is highly transparent with low reflectance.

i. Ground story transparency, when defined separately from the overall minimum transparency, shall be measured between two feet and eight feet from the average grade at the base of the front facade.

ii. A general minimum transparency requirement shall be measured from floor to floor of each story.

Figure 12.04. Measuring Transparency



Measuring Ground Floor Transparency on a Storefront base.

c. "Tree canopy" means the uppermost area of spreading branches and leaves of a tree.

d. "Tree canopy coverage" means the area of ground covered or shaded by a tree's canopy, measured in square feet.

21. *"U" Definitions.*

a. "Use," also referred to as "land use," means a purpose or activity that may occur within a building or a lot.

b. "Use, accessory" means a use customarily incidental and subordinate to the principal use or structure and located on the same lot with such principal use or structure.

c. "Use, principal" means the specific, primary purpose for which a lot or building is utilized.

d. "Utility/infrastructure" means a lot that is primarily utilized for the city's infrastructure needs. "Utility/infrastructure" includes such uses as electric or gas services, sewage treatment, water treatment and storage, and energy conversion systems.

22. *"V" Definitions.*

a. "Visible basement" means a half story partially below grade and partially exposed above with required transparency on the street facade.

23. *"W" Definitions.*

a. "Water body" means a body of water, such as a river, pond, or lake, that may be manmade or naturally occurring.

24. *"X" Definitions.*

25. *"Y" Definitions.*

a. "Yard" means the space on a lot which is unoccupied and unobstructed from the ground to the sky by the principal structure. Lots without a structure do not have yard designations. Refer to Figure 12.05, Yards.

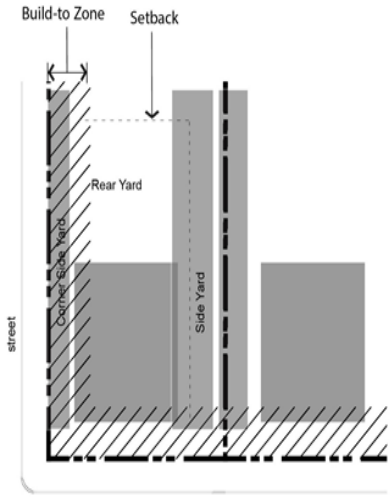
b. "Yard, corner side" means a yard extending from the corner side building facade along a corner side property line between the front yard and rear property line. Refer to Figure 12.05, Yards.

c. "Yard, front" means a yard extending from the front facade of the principal structure along the full length of the front property line, between the side property lines or side and corner side property lines. Refer to Figure 12.05, Yards.

d. "Yard, rear" means a yard extending from the rear building facade along the rear property line between the side yards or, on a corner lot, the corner side and side yards. Refer to Figure 12.05, Yards.

e. "Yard, side" means a yard extending from the side building facade along a side property line between the front yard and rear property line. Refer to Figure 12.05, Yards.

Figure 12.05. Yards



26. *"Z" Definitions.*

(Ord. 2021-08 § 1 (Att. A); Ord. 2020-04 § 1 (Att. A (part)))

The Midvale Municipal Code is current through Ordinance 2024-31, passed December 3, 2024.

Disclaimer: The city clerk's office has the official version of the Midvale Municipal Code. Users should contact the city clerk's office for ordinances passed subsequent to the ordinance cited above.

City Website: www.midvalecity.org

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MIDVALE CITY PLANNING COMMISSION
STAFF REPORT
09/10/2025

SUBJECT

Midvale City Water Use and Preservation Element of the General Plan

SUBMITTED BY

Wendelin Knobloch, Planning Director

BACKGROUND AND ANALYSIS

The Water Use and Preservation Element of the General Plan is required by state law just like other General Plan elements the Utah State Legislature has made mandatory in recent years. This General Plan element's goal is to further institutionalize water planning and preservation through any contribution a municipality's land development system can make. Midvale is well positioned in the water planning area with the 2024 Water Conservation Plan and the 2020 Drinking Water System Master Plan. Future work will include continued calibration of Midvale's ordinance system with respect to efficient outdoor water use and a more streamlined implementation of the JVWCD Water Efficiency Standards.

STAFF RECOMMENDATION

Staff recommends approval of the Water Use and Preservation Element of the General Plan with the following finding:

- The Water Use and Preservation Element complies with UCA 10-9a-403.

RECOMMENDED MOTION

I move that we recommend approval of the Water Use and Preservation Element of the General Plan with the finding noted in the staff report.

ATTACHMENTS

1. Draft Plan

Midvale City

Water Use & Preservation Element of the General Plan

Approved 10/2025

Introduction

Life in the western part of the United States, including Utah, has always revolved around the availability and scarcity of water resources because water is one of the most basic necessities of life.

Early native American inhabitants of Utah, such as the Ute, Goshute, Paiute, and Navajo cultivated a harmonious relationship with this life sustaining resource. They lived nomadic or semi-nomadic lifestyles that tracked the availability of water and often moved in seasonal cycles with careful regard to their stewardship of the given resources. Their views about and use of water and other natural resources had deep spiritual roots and was sustainable.

The subsequent arrival of predominantly European-American settlers in 1847 followed by continued rapid immigration changed sustainable water practices in an environment of a stable population count to rapid population growth with its attendant demand for water in combination with non-native attitudes and techniques toward the use and harvesting of water.

With this pattern continuing until today the State of Utah finds itself in a situation where the population count is at an all-time high of approximately 3.5 million with water consumption patterns that have not changed enough to ensure that future population growth can be serviced without further damaging strained ecosystems like the Great Salt Lake.

The following sections will introduce the statutory background municipal water planning in Utah is based on, regional water conservation goals, the Midvale Water Conservation Plan, the Midvale Drinking Water System Master Plan, and the different means and ways of conserving water.

Water Planning in Utah

During the 2022 legislative session, the Utah Senate approved SB 110 (see below), which requires cities like Midvale to incorporate a Water Use and Preservation Element into their general plan. During the following legislative session SB 76 added a requirement to consult with the Division of Water Resources regarding regional conservation goals and how a city's plan may affect the Great Salt Lake.

The bill requires cities to take defined steps to create this new general plan element as spelled out in the bill text below. This general plan element will follow the state law's required analysis step by step to create recommendations and policy that comply with

regional water conservation goals and at the same time address Midvale City's residents' needs.

SB 110, Utah Code 10-9a-403 (2)(f)

(f) In drafting the water use and preservation element, the planning commission:

(i) shall consider:

(A) applicable regional water conservation goals recommended by the Division of Water Resources; and

(B) if Section 73-10-32 requires the municipality to adopt a water conservation plan pursuant to Section 73-10-32, the municipality's water conservation plan;

(ii)shall include a recommendation for:

(A) water conservation policies to be determined by the municipality; and

(B) landscaping options within a public street for current and future development that do not require the use of lawn or turf in a parkstrip;

(iii) shall review the municipality's land use ordinances and include a recommendation for changes to an ordinance that promotes the inefficient use of water;

(iv) shall consider principles of sustainable landscaping, including the:

(A) reduction or limitation of the use of lawn or turf;

(B) promotion of site-specific landscape design that decreases stormwater runoff or runoff of water used for irrigation;

(C) preservation and use of healthy trees that have a reasonable water requirement or are resistant to dry soil conditions;

(D) elimination or regulation of ponds, pools, and other features that promote unnecessary water evaporation;

(E) reduction of yard waste; and

(F) use of an irrigation system, including drip irrigation, best adapted to provide the optimal amount of water to the plants being irrigated;

(v) shall consult with the public water system or systems serving the municipality with drinking water regarding how implementation of the land use element and water use and preservation element may affect:

(A) water supply planning, including drinking water source and storage capacity consistent with Section 19-4-114; and

(B) water distribution planning, including master plans, infrastructure asset management programs and plans, infrastructure replacement plans, and impact fee facilities plans;

(vi) shall consult with the Division of Water Resources for information and technical resources regarding regional water conservation goals, including how implementation of the land use element and the water use and preservation element may affect the Great Salt Lake;

(vii) may include recommendations for additional water demand reduction strategies, including:

(A) creating a water budget associated with a particular type of development;

(B) adopting new or modified lot size, configuration, and landscaping standards that will reduce water demand for new single family development;

(C) providing one or more water reduction incentives for existing development such as modification of existing landscapes and irrigation systems and installation of water fixtures or systems that minimize water demand;

(D) discouraging incentives for economic development activities that do not adequately account for water use or do not include strategies for reducing water demand; and

(E) adopting water concurrency standards requiring that adequate water supplies and facilities are or will be in place for new development; and

(viii) for a town, may include, and for another municipality, shall include, a recommendation for low water use landscaping standards for a new:

(A) commercial, industrial, or institutional development;

(B) common interest community, as defined in Section 57-25-102; or

(C) multifamily housing project.

Midvale's Water Plans and Water Budget

Midvale's water policy is governed by two existing plans:

1. Midvale Water Conservation Plan
2. Midvale Drinking Water System Master Plan.

The Midvale Water Conservation Plan is based on the Utah Code 73-10-32 which was approved in 1998 and required a Water Conservation Plan from 1999 onward.

The latest version of the Midvale Water Conservation Plan is attached and serves as the basis from which to evaluate how Midvale can institutionalize water saving processes from within the General Plan context.

The Water Conservation Plan details the following:

1. Midvale's water use over time
2. Demand and Supply balance now and in the future
3. Delivery system improvements
4. Water rate structure
5. Existing conservation measures
6. Proposed conservation measures

The Water Conservation Plan builds on the Drinking Water System Master Plan and references its core analysis regarding the water demand and supply balance.

The Drinking Water System Master Plan states that Equivalent Residential Connections (ERCs) will increase from a13,940 in 2019 to 23,580 in 2060. An ERC represents the average water demand of an average residential water connection.

Under 2019 conditions Table 3-11 below (Drinking Water System Master Plan p.3-9) shows that Midvale has sufficient water to fulfill demand with a remaining source capacity of 232 acre feet.

Table 3-11: Existing Average Yearly Demand Requirements by Pressure Zone

Zone	ERCs	Demand (acre-feet)	Water Supply Capacity in Zone (acre-feet)			
			Available			Remaining
			City Water Rights	JVWCD[1]	Total	
Midvale	11,970	6,700	4,952	1,875	6,297	127
North Union	630	355	0	1,210	1,210	105
South Union	1,340	750				
Total	**13,940**	**7,805**	**4,952**	**3,085**	**8,037**	**232**

[1] The proportion of the JVWCD contract amount allotted to each zone is arbitrary. The contract does not limit volumes by pressure zone.

Conditions in the year 2060, however, show that Midvale's current supply will not be sufficient to service predicted demand (see Table 3-16 below, Drinking Water System Master Plan p.3-12).

Table 3-16: 2060 Average Yearly Demand Requirements by Pressure Zone

Zone	ERCs	Demand (acre-feet)	Water Supply Capacity in Zone (acre-feet)			
			Available			Remaining
			City Water Rights	JVWCD[1]	Total	
Midvale	11,970	11,345	4,952	1,875	6,827	-4,518
North Union	630	760	0	1,210	1,215	-650
South Union	1,340	1,100				
Total	**23,580**	**13,205**	**4,952**	**3,085**	**8,037**	**-5,168**

[1]The proportion of the JVWCD contract amount allotted to each zone is arbitrary. The contract does not limit volumes by pressure zone.

Midvale will require an additional 5,168 acre-feet of water from JVWCD to meet future demand (Drinking Water System Master Plan p.3-13). In a consultation with JVWCD (see Appendix F) Midvale was assured that future water supply for Midvale and other municipalities in the JVWCD service area is secure, however, the cost may increase substantially, especially if a member city demands water in excess of its contractual allotment.

For this reason, Midvale and JVWCD are actively involved in finding, incentivizing, and sustaining ways to decrease water consumption, which is addressed below.

Statewide and Regional Water Conservation Goals

In addition to the Midvale Water Conservation Plan, the State of Utah's Regional Water Conservation Goals (Appendix A) inform what this general plan element should focus on.

The Utah Department of Natural Resources describes the Regional Water Conservation Goals as follows (Department of Natural Resources, 7/7/2025. *Regional Water Conservation Goals*):

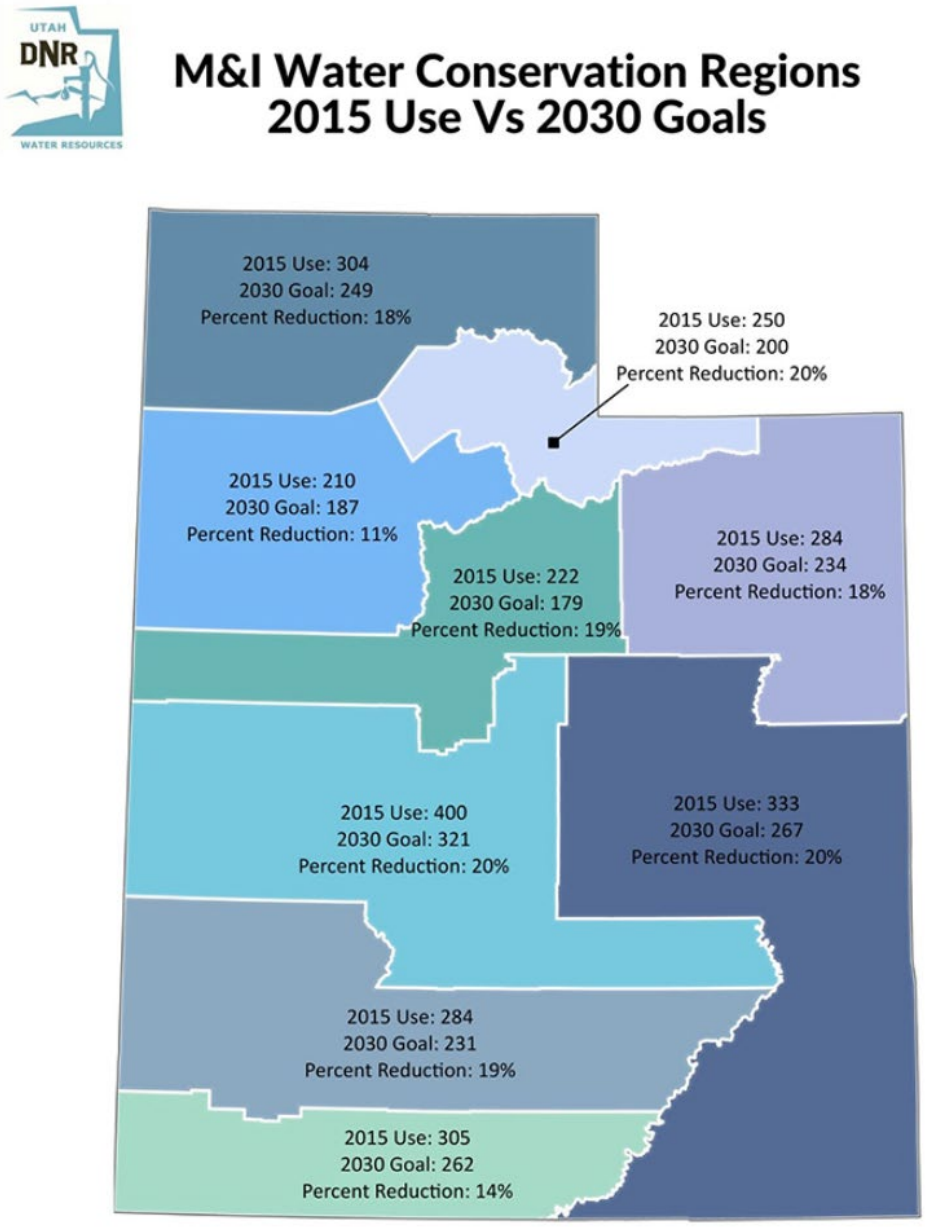
> The state's Regional Water Conservation Goals, established in 2019, are for Utah's nine municipal and industrial (M&I) areas. M&I includes residential, commercial, institutional (for example, schools and parks) and industrial water use, but excludes agriculture, mining, and power generation as these are classified individually.
>
> As recommended by the 2015 Legislative Audit, 2017 Follow-up Audit, Third-Party Review, and 2017 Recommended State Water Strategy, regional water conservation goals were developed to enhance water conservation efforts around the state. Region-specific goals support the unique characteristics and needs of Utah's diverse climates and ecosystems.
>
> Thanks to the efforts of many Utahns and their water providers, per capita water use has declined by at least 18%. We've made significant progress, but more must be done to accomplish these goals including policy and ordinance changes on state, local and municipal levels. Even with all the progress that has been made, balanced efforts both in water development and water conservation are still necessary to meet Utah's long-term water needs. This is the first time conservation goals have been established on a regional level, and they build on the previously established statewide goal of reducing per-capita use by 25% by 2025, (using the 2000 M&I water use report as a starting value).

Midvale City already reached the statewide goal of reducing per capita water consumption by 25% by 2025 (Water Conservation Plan, p.12).

The state goal for the Salt Lake/Tooele municipal and industrial area (see Figure 1) is a consumption of 187 GPCD (Gallon Per Capita Per Day) by the year 2030.

Today, Midvale is already 39 GPCD below the 2030 goal of 187 GPCD with a consumption of 148 GPCD and plans to continue to reduce per capita use by 11% from 2015 to 2030 for a consumption of 131.72 GPCD. At that point in time, Midvale will consume 55.28 GPCD (30%) less than the regional goal.

Figure 1



A regional approach allows the goals to be tailored for nine different regions and takes into account climate, elevation, and each region's characteristics. Note: Use is measured in gallons per capita per day.

Midvale's Water Conservation Policies

A further reduction in Midvale City's water consumption will require focused policies that institutionalize processes to save water. Midvale's current water conservation policies include the following:

Public Education

Midvale City actively promotes water conservation measures to its residents through multiple channels, ensuring a comprehensive approach to sustainability. The city's website serves as a central hub, offering detailed guidelines, tips, and resources on efficient water usage and the importance of conservation.

Annually, the city's water quality report not only provides essential information about the safety and quality of the water supply but also includes practical advice on how residents can reduce their water consumption. Additionally, the city newsletter features regular articles and updates on water-saving initiatives and upcoming conservation workshops.

Require Water Saving Fixtures

Midvale City has adopted the International Plumbing Code, mandating the use of water-saving plumbing fixtures in all new developments to enhance sustainability and resource efficiency. During the building permit review process, the city meticulously examines building plans to ensure they incorporate these water-efficient fixtures. Compliance with the code is further enforced through rigorous building inspections, ensuring that all new constructions adhere to these water conservation standards. This proactive approach not only promotes responsible water usage but also supports Midvale City's broader environmental goals.

Replace Old Water Service Laterals

Midvale City has adopted a material standard aimed at improving the durability and efficiency of its water infrastructure by requiring that all leaking galvanized water laterals be replaced with copper or poly piping. This measure is part of the city's commitment to maintaining a reliable and sustainable water supply system. When a pipeline replacement project is conducted, any existing galvanized laterals are systematically replaced to prevent future leaks and ensure long-term resilience. By upgrading to copper or poly piping, Midvale City not only enhances the overall quality of its water distribution network but also reduces maintenance costs and water loss.

Replacement Program for Old Pipelines

Midvale City is committed to the ongoing improvement of its water infrastructure by aiming to replace 1,000 feet of pipeline annually. This systematic approach is aligned with the city's master plan, ensuring that pipeline replacement projects are strategically conducted in conjunction with street renovations, as leaks are detected, and as the annual budget permits. By integrating pipeline replacements with broader infrastructure projects, Midvale City maximizes efficiency and minimizes disruption to residents. This proactive replacement strategy not only helps maintain a reliable water distribution system but also supports its broader water conservation goals by reducing leaks and water loss, thereby ensuring a more sustainable and efficient use of water resources for the community.

Replacement Program of Old Water Meters

Midvale City has implemented a comprehensive meter replacement program to enhance the accuracy and efficiency of water usage monitoring. New, accurate radio-read meters are installed at all connections, allowing for precise data collection. During monthly meter scans, the city identifies meters with continuous flow, indicating potential leaks, and promptly contacts the respective residents. Meters showing abnormally high usage are also flagged, with residents being notified to address possible issues. Additionally, meters registering zero flow are noted, and if found to be broken or inaccurate, they are promptly replaced. This diligent monitoring and proactive replacement approach ensures accurate billing and reduces water waste.

Restrict Water Use for Public Landscaped Areas

Midvale City enforces water use restrictions for public landscaped areas to promote efficient water usage and conservation. Sprinkler systems are carefully adjusted based on current weather conditions, ensuring that landscapes receive the appropriate amount of water without waste. Watering is scheduled for the evening or early morning hours to minimize water loss due to evaporation, maximizing the effectiveness of irrigation. This strategic approach not only conserves water but also helps maintain the health of public green spaces.

Require Separate Meters for Large Irrigated Areas

Midvale City mandates the installation of separate meters for large, irrigated areas in commercial and industrial properties. This requirement ensures that water usage for landscaping is distinctly monitored, promoting responsible water management practices. By isolating irrigation water consumption, the city can more accurately track and manage water usage, encouraging businesses to adopt efficient irrigation techniques. This policy

aids in identifying potential leaks and inefficiencies ensuring that commercial and industrial landscape areas are maintained without compromising valuable water resources.

Evaluate Water Rate Structure

Midvale City conducts an annual evaluation of its water rate structure to promote water conservation and ensure the sustainability of its water resources. By reviewing and adjusting the rates each year, the city aims to incentivize efficient water usage among residents and businesses. The rate structure is designed to reflect the true cost of water provision and to encourage conservation by implementing tiered pricing, where higher usage results in higher rates. The annual assessment allows the city to adapt to changing water supply conditions, economic factors, and consumption patterns, reinforcing its commitment to responsible water management and the long-term preservation of this vital resource.

The following conservation goals have been identified by the city to help continue to reduce water consumption. Some of these goals were previously implemented but are being updated with additional information to align with future conservation goals.

Public Education: Updated Annually

Midvale City remains committed to promoting water conservation measures among its residents through ongoing public education initiatives. In alignment with the newly adopted Jordan Valley Water Conservancy District conservation measures, the city will update all relevant information to ensure residents are well-informed and equipped to conserve water effectively. This commitment extends to advertising conservation measures by providing convenient access to water conservation websites through links on the city website. As part of these efforts, the city will continue public education campaigns, encouraging customers to limit outside watering to the hours of 6 pm to 10 am. This information will be reviewed and updated annually.

Unmetered Connections and Water Use: Conducted Monthly

The city will undertake efforts to identify potential causes of unmetered or unaccounted drinking water. The investigation and analysis is conducted monthly based on meter reading data. Midvale City aims to pinpoint areas where water may be escaping the metering system or being lost through leaks or other means. Additional Hydrant meters will be purchased to help account for water used during fire hydrant flushing. By addressing these issues proactively, the city can mitigate water loss, conserve resources, and ensure

efficient distribution of safe drinking water to residents and businesses. This will be reviewed and updated monthly.

Pipeline Repairs: Conducted Upon Discovery of Leak

Midvale City is committed to promptly replace leaking pipelines as they are discovered to minimize water loss and ensure the efficient delivery of clean water to residents. The city prioritizes replacement of leaking water pipes to minimize environmental impact and conserve resources. This will be conducted upon the discovery of a leak and processes will be reviewed and revised annually.

Landscaping Options for Public Streets

Utah Code 10-9a-403 (2)(f)(ii)(B) requires landscaping options within a public street for current and future development that do not require the use of lawn or turf in a park strip.

Midvale City complies with this stipulation because its zoning ordinances already allow park strips with xeriscape, for example in the Single-Family Residential Zone (SF-1) (Midvale Municipal Code 17-7-1.6(A)).

The zoning code states that xeriscape is allowed to fulfill the landscape requirements (see sentence in bold) while turf is just one of many options:

> A. *Landscaping Required*. Yard and setback areas visible from street access, including park-strips, that are not utilized as approved parking or access for vehicles, trailers, etc., shall be landscaped. Landscaping shall include the treatment of the ground surface with live materials such as, but not limited to, sod, grass, ground cover, trees, shrubs, vines and other growing horticultural plant material. **In addition, a combination of xeriscape plantings and designs that may include other decorative surfacing such as bark chips, crushed stone, mulch materials, decorative concrete or pavers shall also meet landscaping requirements.** Structural features such as fountains, pools, statues, and benches shall also be considered part of the landscaping, but such objects alone shall not meet the requirements of landscaping.

In addition to the above, Midvale City adopted the Jordan Valley Water Conservancy District Water Efficiency Standards on May 7th, 2024 (Attachment D) which supersede individual zoning requirements (Midvale Municipal Code 17-6-2) and further reduce the use of lawn in park strips by prohibiting it at slopes greater than 25% and when the narrowest point of the park strip is less than 8 feet in width:

F. **Lawn shall not be installed** in Park Strips, Paths, or on slopes **greater than 25%** or 4:1 grade, and be **less than 8 feet wide at its narrowest point**. To the extent reasonably practicable, Lawn shall be free from obstructions (trees, signs, posts, valve boxes, etc.).

Midvale City's newly adopted road cross sections do not feature park strips that are greater than 8 feet as a result turf is not allowed.

Principles of Sustainable Landscaping

Utah Code 10-9a-403 (2)(f)(iv) requires that municipalities consider the following principles of sustainable landscaping:

(A) reduction or limitation of the use of lawn or turf;

Midvale City adopted the Jordan Valley Water Conservancy District Water Efficiency Standards which specifically address the reduction and limitation of lawn or turf as shown in Attachment D.

(B) promotion of site-specific landscape design that decreases stormwater runoff or runoff of water used for irrigation;

Midvale City has an MS4 permit that addresses stormwater retention.

(C) preservation and use of healthy trees that have a reasonable water requirement or are resistant to dry soil conditions;

Midvale City created a Street Tree Selection Guide that promotes appropriate tree selection for local conditions (See Attachment E).

(D) elimination or regulation of ponds, pools, and other features that promote unnecessary water evaporation;

The regulation of ponds, pools, and other features that promote unnecessary water evaporation is currently not included in Midvale's ordinance system with regard to evaporation reduction but may be addressed at a future point in time.

(E) reduction of yard waste; and

Midvale City provides a Fall Leaf Cleanup Program and a Bulky Waste Program and educates residents about stormwater pollution prevention (see https://www.midvale.utah.gov/government/departments/public_works/stormwater_division/stormwater_education.php retrieved on 7/9/2025).

(F) use of an irrigation system, including drip irrigation, best adapted to provide the optimal amount of water to the plants being irrigated;

Midvale City's municipal code requires the use of drip irrigation (see Attachment D).

Other Recommendations for Water Demand Reduction Strategies

Utah Code 10-9a-403 (2)(f)(vii) provides the option to recommend additional water reduction strategies as shown below:

(vii) may include recommendations for additional water demand reduction strategies, including:

(A) creating a water budget associated with a particular type of development;

The Drinking Water System Master Plan models current and future water consumption and supply which shows a need for additional water purchases considering current consumption patterns. Any reduction in water consumption will reduce Midvale's reliance on water purchases.

(B) adopting new or modified lot size, configuration, and landscaping standards that will reduce water demand for new single family development;

Midvale City is very close to being built out and only few if any single-family development is anticipated in the future. If additional single-family development will occur the lot sizes will likely be less than 7,000 square feet and be covered by the Jordan Valley Water Conservancy District Water Efficiency standards.

(C) providing one or more water reduction incentives for existing development such as modification of existing landscapes and irrigation systems and installation of water fixtures or systems that minimize water demand;

Midvale City participates in the Localscapes program which is administered by the Jordan Valley Water Conservancy District and regularly receives applications to install waterwise landscaping compliant with the Localscapes criteria. For usage of the Localscapes program through JVWCD refer to Appendix G.

(D) discouraging incentives for economic development activities that do not adequately account for water use or do not include strategies for reducing water demand; and

Midvale City offers some incentives for economic development activities in its RDA project areas which focus on high density development and redevelopment. These types of projects are waterwise by nature because there is very little landscaping

required and lawn is prohibited in the Form-Based Code area. Other zones allow lawn but only within the confines of the Jordan River Water Conservancy District Water Efficiency Standards.

(E) adopting water concurrency standards requiring that adequate water supplies and facilities are or will be in place for new development; and

Concurrency standards for water facilities are in place as part of the development process and water supplies are adequate to cover current water demand and future growth.

(viii) for a town, may include, and for another municipality, shall include, a recommendation for low water use landscaping standards for a new:

(A) commercial, industrial, or institutional development;

(B) common interest community, as defined in Section 57-25-102; or

(C) multifamily housing project.

Commercial, industrial, institutional, common interest communities, and multifamily housing projects are already covered by the recently approved Jordan Valley Water Conservancy District Water Efficiency Standards which greatly reduce the amount of turf for landscaping in the above development scenarios.

Review of City's Land Use Ordinance for Inefficient Use of Water

Utah Code 10-9a-403 (2)(f)(iii) requires a review of the municipality's land use ordinances and includes a recommendation for changes to an ordinance that promotes the inefficient use of water.

Midvale City adopted the Jordan Valley Water Conservancy District's Water Efficiency Standards and incorporated them into the code under supplementary regulations. These regulations supersede the landscaping sections in the code if there is a discrepancy, such as in the Regional Commercial Zone (RM). Section 17-7-12.6(A)(5)(b)(iii) states:

iv. *Turfgrass*. Plan shall delineate turfgrass areas and include a calculation (%) of irrigated turfgrass not to exceed fifty percent of the landscaped areas. Turf areas shall be on a separate irrigation zone from other landscape zones.

This section contradicts Section 5-G-v in the Water Efficiency Standards which states:

> v. Lawn areas shall not exceed the greater of 250 square feet, or 35% of the Total Landscaped Area.

This obvious discrepancy between 35% and 50% may result in a landscape plan for new development that exceeds the governing provisions in the Water Efficiency Standards and may or may not be caught in a review. Future code revisions should address this discrepancy so that the water saving outcomes of lawn surface reduction is achieved.

What Are the Benefits of Water Conservation for Midvale City?

Water conservation will accomplish two separate goals for Midvale City and its residents:

1. ## Budgetary Predictability and Savings

   Water is one of the building blocks of life, especially in a geographic area that does not have abundant water resources. In Utah's history the importance of water was recognized early on and spurred the communal development of reservoirs, pipelines, and canals to collect this vital resource and deliver it to the consumer. This process was perfected over time and resulted in many people taking the availability of water for granted.

   With a growing population, rising water consumption due to growth, frequent drought, and exacerbating conditions driven by climate change, water will become more valuable and require higher levels of investment to maintain current service levels. As a result, conservation can serve as a fiscal "insurance policy" to minimize the cost of additional water purchases or additional infrastructure to develop more water resources.

2. ## Preservation of the Great Salt Lake Ecosystem

   The Great Salt Lake is the largest waterbody in the State of Utah and is threatened by overuse of its watershed. Since the late nineteenth century, the Great Salt Lake has seen a decline of 11 feet which threatens its ability to serve its role in the wider ecosystem.

The Great Salt Lake provides the following:

- Habitat for a wide array of local and migratory bird species
- Recreational and industrial activity worth $1.5 billion
- Generation of 50% of the precipitation of surrounding areas.

(Adapted from Utah Department of Environmental Quality, 9/3/2025. *Great Salt Lake Water Conservation Toolbox*)

The role of conservation in this context is critical. The Great Salt Lake needs additional water deliveries and these are directly driven by lower water consumption, especially in outdoor water use. Water savings that are generated in Midvale City directly benefit the Great Salt Lake due to the connected nature of the watershed.

Conclusion

This Water Use and Preservation Element of the General Plan has synthesized the currently existing water plans on the state and local level with an emphasis on water conservation and the outlook for Midvale's water supply and use balance.

Under current conditions, Midvale will be required to purchase additional water from JVWCD in the future due to growth related water consumption. By decreasing the per capita water consumption with the tools described in the plan, future water purchases can be reduced as much as possible. This will give Midvale a fiscal advantage over the status quo and contribute to responsible stewardship over the water resources in the Great Salt Lake watershed.

In the midterm, continued calibration of Midvale's ordinance system with respect to efficient outdoor water use and a more streamlined implementation of the JVWCD Water Efficiency Standards will ensure that Midvale will be able to reap measurable water savings.

Appendices

A. Utah's Regional M&I Water Conservation Goals
B. Midvale Water Conservation Plan
C. Midvale Drinking Water System Master Plan
D. Ordinance Adopting the Jordan Valley Water Conservancy District's Water Efficiency Standards
E. Street Tree Selection Guide
F. Consultation with JVWCD

Appendix A

Utah's Regional M&I Water Conservation Goals

PLAN, CONSERVE, DEVELOP, AND PROTECT UTAH'S WATER RESOURCES

Utah's Regional M&I Water Conservation Goals

November 2019

Prepared for:

UTAH DNR WATER RESOURCES

Prepared by:

HANSEN ALLEN & LUCE INC ENGINEERS

BOWEN COLLINS & ASSOCIATES

UTAH'S REGIONAL M&I WATER CONSERVATION GOALS

Prepared for:
Utah Division of Water Resources

Prepared by:
Hansen, Allen & Luce, Inc.
Bowen Collins & Associates, Inc.

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November 2019

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PREFACE

The 2030 water conservation goals in this report will require significant effort, increased attention, participation and funding from the legislature, state agencies, municipal water retailers, local elected officials, wholesale public water suppliers and citizens of Utah.

Depending on the approaches taken and water user behavior, costs for achieving the targets associated with the recommendations in this report are estimated in the range of $1.4 billion of capital cost. An important aspect of covering these costs will be who pays for the costs, what the relationship is between the cost and use of water, and how the capital costs of conservation net against not yet identified conservation savings and the price of increasing water scarcity.

The goals require the state and its municipalities to increase water pricing, establish and enforce water use ordinances, encourage broader adoption of existing water technology, as well as secure additional funding to reach the target water use levels.

These efforts fall on all those who have the authority to implement the measures recommended in this report, including but not limited to state and local elected officials in their key roles and businesses. These efforts include, but are not limited to:

1. Reducing new lot sizes, as determined by both market forces and state or local elected officials setting land use policy;
2. Adopting water efficient practices and landscaping changes, including reductions in grass, as determined by both market forces and state or local elected officials through landscaping and water restricting ordinances;
3. Installing secondary water meters and smart controllers on outdoor irrigation systems, as determined by water consumers through market forces and state or local elected officials; and
4. Increasing water pricing, as determined by municipal water retailers and state policies.

Recognizing these measures will require time to enact and implement, the state of Utah recommends a five-year flexibility period to achieve these 2030 goals.

Given the state's wholesale public water suppliers do not have the authority to regulate land use, mandate conservation practices or set end user water rates, they are tasked with providing support, recommendations, educational resources and leadership to the state as well as the municipalities and constituents in their respective service areas.

ABBREVIATIONS AND UNITS

ac	acre
ac-ft	acre-foot (325,851 gal)
AGRC	Utah Automated Geographic Reference Center
BC&A	Bowen Collins & Associates, Inc.
DNR	Utah Department of Natural Resources
DWRe	Utah Division of Water Resources
ET	evapotranspiration
ft	foot
ft^2	square foot
gal	gallon
gpcd	gallons per capita per day (based on permanent population)
gpm	gallons per minute
GSLAC	Great Salt Lake Advisory Council
GWSAT	Governor's Water Strategy Advisory Team
HAL	Hansen, Allen & Luce, Inc.
OLAG	Utah Office of the Legislative Auditor General
M&I	municipal and industrial [water use]
USGS	U.S. Geological Survey
yr	year

EXECUTIVE SUMMARY

Utah's Regional M&I Water Conservation Goals

PURPOSE

This project recommends regional goals and practices for municipal and industrial (M&I) water conservation. M&I includes residential, commercial, institutional (e.g., schools and parks), and industrial water use, and excludes agriculture, mining, aquaculture, and power generation. The project does not recommend a comprehensive water strategy.

PROGRESS TOWARD STATEWIDE GOAL

Utah's statewide water conservation goal has been "25% by 2025," that is, to reduce per-capita M&I water use by 25% when starting at the value estimated for 2000. Thanks to the efforts of many Utahns and their water providers, 2015 M&I per capita water use declined by at least 18% since then. Annual reporting from many individual water suppliers confirms significant progress in water conservation. According to the state's most recent data, the 2015 statewide M&I water use estimate is about 240 gallons per capita per day (gpcd). Water suppliers and users alike are commended for their efforts to reduce water use.

NEED FOR REGIONAL GOALS

While this progress is excellent, the continued growth and demand for water is not stopping. Both water conservation and development of new supplies will be necessary to meet Utah's long-term water needs. The next step—and one recommended by a legislative audit (no. 2015-01) and the *Recommended State Water Strategy*—is a suite of regional M&I water conservation goals that consider the various climates, populations, and water use practices in different parts of the state. These goals will guide the state's water industry in planning future infrastructure, policies, and programs consistent with Utah's semiarid climate and growing demand for water.

HIGHLIGHTS

- Regional M&I water conservation goals are recommended for 2030, and projections are given for 2040 and 2065.
- Utah's Municipal and industrial (M&I) per capita water use declined by at least 18% from 2000 to 2015.
- Considered together, the 2030 regional goals constitute a 16% reduction in per capita use from the new 2015 baseline.
- Several water conservation practices are recommended to help achieve the goals.
- Implementation will be an immense effort requiring funding and engagement from all Utahns.

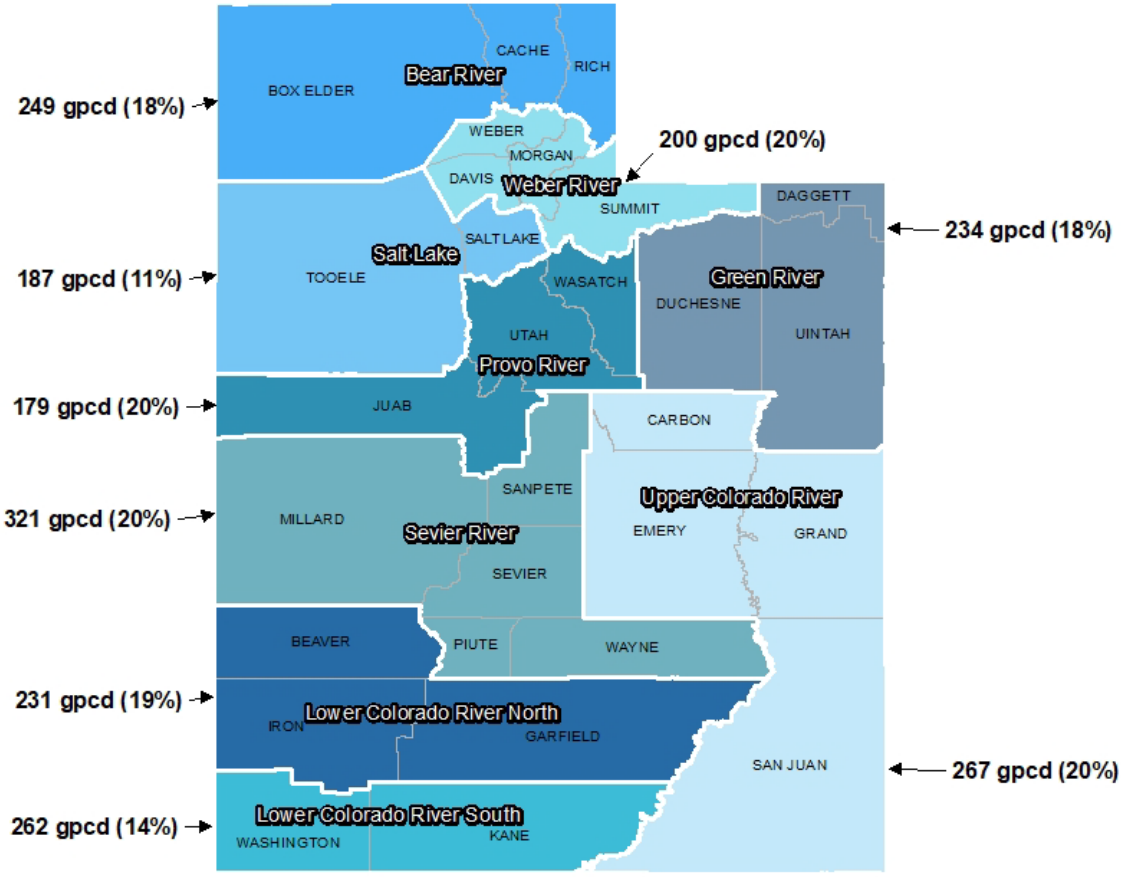
APPROACH

Recognizing its potential impact on Utahns, the project began with a large public involvement effort. An online survey collected information about water use awareness, attitudes, and opportunities from a broad audience, while a series of public open houses and interviews with key stakeholders provided more in-depth insight into the important issues. Early draft reports were circulated to several parties for review. The public process strongly affirmed the need for regional goals and guided the project team to data, perspective, and questions that improved the quality of the work.

Multiple factors were considered when determining regions, including data availability, number of regions, water use practices, similarity of climates, and the ability of the public to recognize the regions. Next, water conservation potential was developed for each region. Many variables were examined; the most influential were secondary metering, climate change, amount of turf on new properties, conversion of turf on existing properties, and conversion to high-efficiency fixtures and appliances. Scenarios were developed to characterize three levels of water conservation within each region. Water conservation practices were then evaluated on gross unit costs, potential for reducing water use, and public acceptance. Finally, combining all of these interdependent elements, the project team developed a timeline of regional water conservation goals and projections from the 2015 baseline year through 2065.

GOALS

Nine water conservation regions are proposed, along with a timeline of M&I water conservation goals and projections for each one. The 2030 values are recommended as the next goals for the State to pursue, while the 2040 and 2065 values are projected water use levels to inform future planning. Actual goals for 2040 will not be established until after evaluating progress toward the 2030 goal, and so on for future goals.



Proposed M&I Water Conservation Regions and 2030 Goals

Proposed Regional M&I 2030 Water Conservation Goals and Future Goal Projections

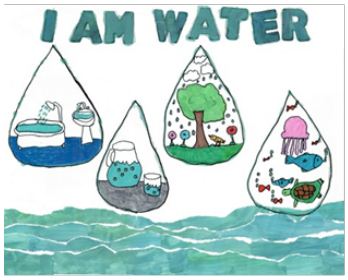
Region	2015 Baseline (gpcd)	2030 Goal		2040 Projection		2065 Projection	
		Goal (gpcd)	Reduction from 2015	Projection (gpcd)	Reduction from 2015	Projection (gpcd)	Reduction from 2015
Bear River	304	249	18%	232	24%	219	28%
Green River	284	234	18%	225	21%	225	21%
Lower Colorado River North	284	231	19%	216	24%	205	28%
Lower Colorado River South	305	262	14%	247	19%	237	22%
Provo River	222	179	20%	162	27%	152	32%
Salt Lake	210	187	11%	178	15%	169	19%
Sevier River	400	321	20%	301	25%	302	24%
Upper Colorado River	333	267	20%	251	25%	248	25%
Weber River	250	200	20%	184	26%	175	30%
Statewide	240	202	16%	188	22%	179	26%

Note M&I = municipal and industrial; gpcd = gallons per capita per day based on permanent population. Reported per-capita use includes all residential, commercial, institutional, and industrial uses averaged over the permanent population in each region.

In 2015, Utah's M&I water use was about 240 gpcd. When considering all regional results together, the resulting water use for the entire state is 202 gpcd by 2030 (16% reduction from 2015), 188 gpcd by 2040 (22% reduction from 2015), and 179 gpcd by 2065 (26% reduction from 2015). Meeting the initial 2030 goal will save nearly 165,000 acre-feet of water annually across the state.

PRACTICES

The following practices are recommended to help achieve the proposed regional M&I water conservation goals. Of necessity, these practices are limited to broad categories that may have different applications in different areas of the state. Local water suppliers, communities, and businesses are encouraged to adapt and refine these recommendations, as well as implement others, in their own water conservation efforts and in pursuit of the regional goals.



GENERAL

- **Water conservation education.** Continued emphasis and funding of education and outreach must be fundamental components of any water conservation plan.
- **Conservation pricing.** Financial impacts will help motivate water conservation. Important features are lowering base rates, increasing tiers for usage, reviewing funding sources, and using customer feedback technology.

INDOOR

- **Fixture conversion.** This will happen naturally with new construction and as old fixtures are replaced, but may be accelerated through incentives and policies.
- **Other measures.** Fixing indoor leaks and inspiring a change in indoor water use habits will reduce consumption.

OUTDOOR

- **Improved irrigation efficiency.** Secondary metering, smart irrigation controls, and drip irrigation systems will improve irrigation efficiency for any landscape.
- **Water-wise landscaping.** New construction can be water-wise from the beginning, while existing landscapes can be converted.
- **Lot size and density guidelines.** Smaller lot sizes and less irrigated area will reduce the amount of water needed outdoors in new developments.

Recommended M&I Water Conservation Practices

(Drawing at top by B. Banner from Salt Lake County)

COSTS

Achieving the goals identified in this report will require a major investment. As with past and current water conservation efforts, the costs are assumed to be borne by all Utahns; however, effective conservation strategies will closely connect water costs to water use.

IMPLEMENTATION

The pursuit of the regional M&I water conservation goals will be an endeavor of immense magnitude but is nonetheless worthwhile for the future of our state. By engaging all parts of our community —not just water suppliers—over extended time periods, this is a challenge we can meet. We can and must do better. Since changing water use behavior, policies, and technologies will become more difficult and expensive with time, prompt action on water conservation will bring the most benefit. A few starting actions are recommended here.

State and Local Policy Leaders

Policy plays a vital role in motivating and enabling water conservation. State, county, and local policy leaders should establish policies which require accountability for efficient water use. Policy leaders' support must consider universal metering, water loss control, education, and other water conservation activities, as well as the necessary funds for success. Policy leaders must also decide whether they are willing to support the necessary land use changes that will be required to reach the water conservation goals. This will include working with and being responsive to market forces to reduce both overall lot sizes for residential development and the amount of turf grass allowed. Water suppliers should be consulted in land-use decisions to ensure alignment with water conservation efforts. Policy leaders can set or influence the pricing of water to promote conservation and reflect the cost of water scarcity. State and local governments should consider the water use impacts of proposed businesses and their plans for water-efficient fixtures, landscaping, and operations before approving construction or incentives.

State Agencies

The Division of Water Resources and other state agencies should continue to support water suppliers' and end users' efforts by analyzing M&I water use data, administering funding programs, reviewing water conservation plans, and promoting education and outreach. It is recommended that the Division evaluate achievement of the 2030 goals and refine the 2040 and 2065 projections accordingly as new data, practices, and technologies develop.

Water Suppliers

Water suppliers have a public responsibility to provide sufficient, safe water to their customers and to carefully manage this invaluable resource. In fulfilling this responsibility, water suppliers are responsible for developing and implementing their own Water Conservation Plans that define local goals, practices, pricing, and accountability. This report recommends several practices which water suppliers may consider, supported by the other parties described here.

Water Users

The water conservation mindset begins with individual water users. By recognizing water as a limited resource and changing their water use practices accordingly, water users will directly impact the overall water situation and the achievement of the regional goals. All Utahns are encouraged to do their part in conserving water for Utah's future.

If you would like to read the entire plan, please access the url below:

https://conservewater.utah.gov/wp-content/uploads/2021/05/Regional-Water-Conservation-Goals-Report-Final.pdf

Appendix B

Midvale Water Conservation Plan

2025

Water Conservation Plan

Bryton Mecham

Utilities Water Quality and Regulatory Administrator

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Introduction

The Midvale City 2024 Water Conservation Plan has been prepared to comply with the Utah Water Conservation Plan Act of 1998 amended in 2004 with House Bill 71 Section 73-10-32. The act requires water conservancy districts and water retailers to file a water conservation plan with the Utah Board of Water Resources and ensure that it is updated every five years. This update outlines Midvale City's current water conservation efforts and presents its current conservation goals.

In response to projected future growth along the Wasatch Front, the citizens and leaders of Midvale City are concerned about the future water supply in the region. The city prepared the original Water Conservation Plan in 1999. Since then, the City's water conservation plan has been amended and updated accordingly to fit state requirements and city infrastructure growth. This report describes the drinking water system, reviews, and summarizes water consumption, assesses the water conservation alternatives available to the city, sets goals to conserve water, and identifies existing and proposed water conservation measures to be implemented by the city.

System Profile

Midvale City, located in the heart of Salt Lake County. The city is bounded by Murray City on the north, Cottonwood Heights on the east, Sandy City on the south, and the Jordan River on the west. As of 6/3/2024 Midvale city currently has 33,000 residents according to the Utah Department of Environmental Quality website.

In 1998, the city annexed the Union area which doubled the size and population of the city at the time. However, the drinking water needs for the Union area continued to be supplied by Sandy City and Jordan Valley Water Conservancy District (JVWCD). During the summer of 2009, Midvale City reached an agreement with Sandy City to take over the drinking water system for the Union area. This was accomplished by the installation of water meters on each pipeline that crossed the Sandy City - Midvale City boundary with Sandy City billing Midvale City on a wholesale basis for water provided to the Union area. As of 2018 Midvale City no longer purchases water from Sandy City. See figure 2-1 to see current water zones.

There are many redevelopment projects that are planned for the city, which are expected to add additional residential and commercial units. The city estimates that in the next 30 years the population will increase to 55,000 residents. Water demands for the city are expected to increase accordingly. As of 2/7/2024 the city currently has 8,432 water connections throughout the distribution system. The connection type is shown in Table 2-1.

Figure 2-1 Water Zone Map

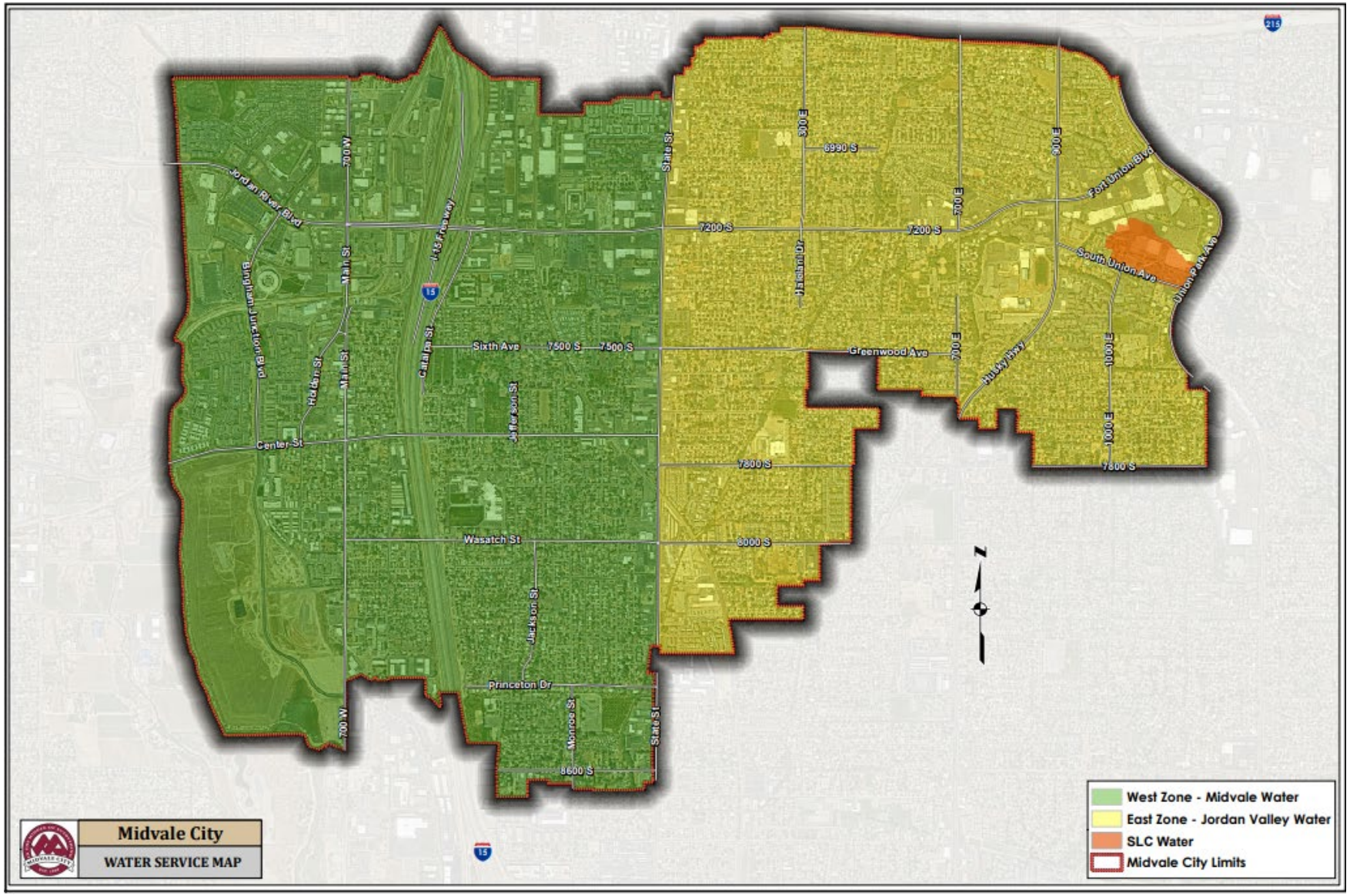


TABLE 2-1
2024 Water System Connections

Connection Type	Total Connections
Residential	7,389
Commercial	1,031
Industrial	3
Total	8,423

Inventory Of Water Resources

The city currently receives drinking water from three active wells, and several wholesale connections to Jordan Valley Conservancy District (JVWCD). Table 2-2 summarizes the city's drinking water sources.

TABLE 2-2 EXISTING WATER SOURCES

Source	Water Rights	Existing Source Capacity
Hancock Well	57-1398 (126 ac-ft), -2251 (4.47 cfs)	2,100 GPM
Million Gallon Well	57-1398, -2251, 7909 (158.5 ac-ft)	2,100 GPM
Oak Street Well	57-1398, -2251	1,200 GPM
JVWCD	Contract with JVWCD	3,085 ac-ft
	Midvale reliable supply (Based on water right limitations and Current Contract with JVWCD):	Wells: 5,275 ac-ft JVWCD 3,085 ac-ft Total: 8,360 ac-ft

Water use

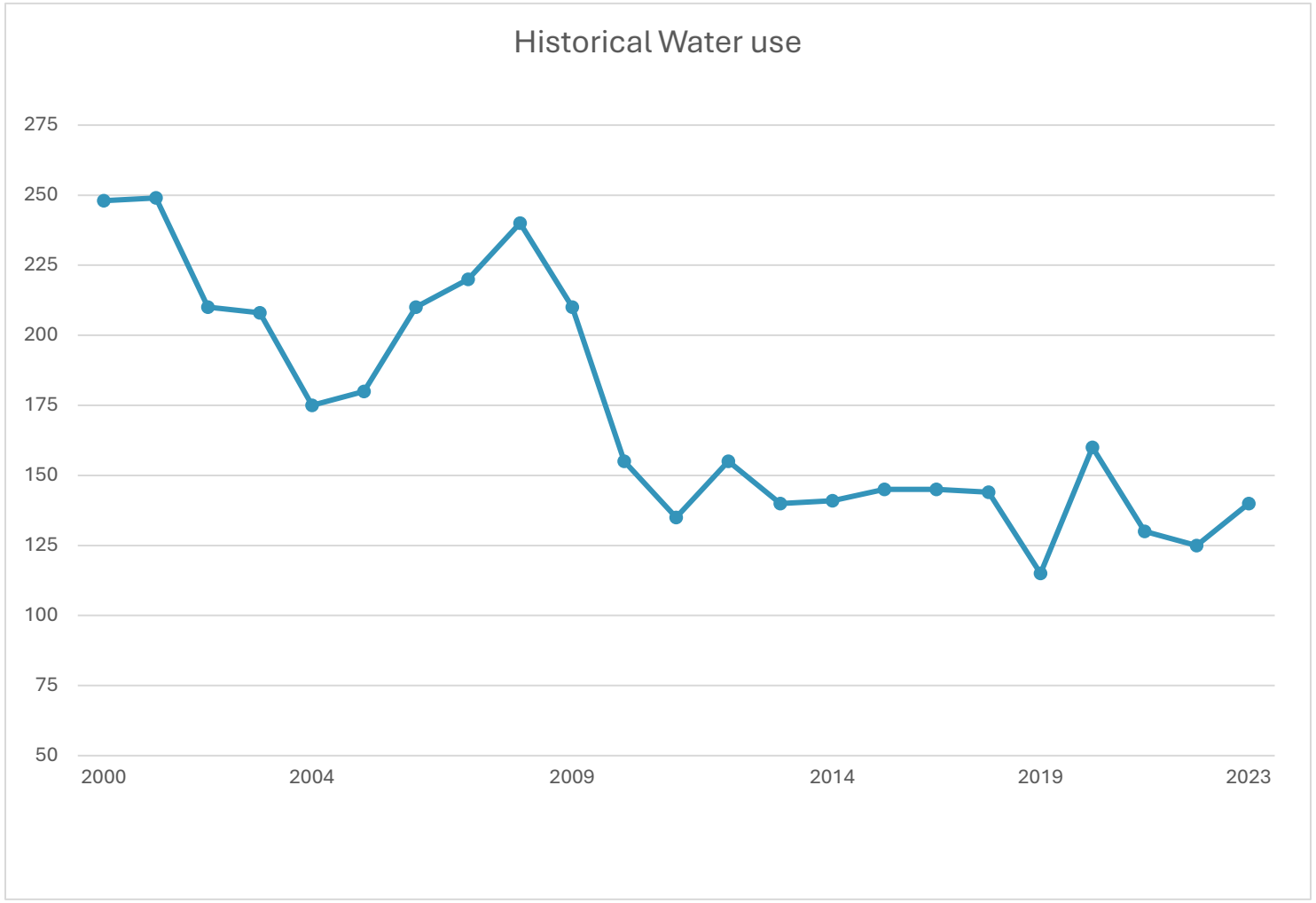
Historical Water supplied by the Midvale city drinking water sources is summarized in table 2-3.

TABLE 2-3 HISTORICAL WATER SUPPLY SUMMARY

YEAR	SOURCE SUPPLIED (AC-FT)					TOTAL (AC-FT)
	HANCOCK WELL	MILLION GALLON WELL	OAK STREET WELL	JVWCD	OTHER EXTERNAL USE	
2015	1144.3	1648.3	448.6	180.51	2,071.27	5,493
2016	856.1	2052.8	358.2	131.1	1,958.8	5,357
2017	979.2	1763.7	345.9	165.6	2,042.6	5,297
2018	915.2	2336.1	332.5	390.1	1,659.1	5,633
2019	1390.0	1393.5	277.5	2627		5,688
2020	1453.15	1459.65	453.2	3542		6,908
2021	1172.35	1218.45	443.2	3113		5,947
2022	920.9	1896.7	168.4	3092		6,078
2023	928.5	1415.9	513.6	3053		5,911

Based on population estimates collected from the US Census for Midvale City, the per capita water use for the city from 1998 through 2001 was approximately 250 gallons per capita per day (gpcd). From 2002 through 2009, the water use dropped to about 200 gpcd. From 2009 through 2014 the use dropped to about 190 gpcd. In the past 5 years, Midvale has continued to show a declining trend in water use. The average for the last 5 years has been 148 gpcd. (See Figure 2-2)

FIGURE 2-2 MIDVALE CITY HISTORICAL WATER USE



(Gallons per capita daily values were calculated using historical US Census data.)

Water use is categorized into residential, commercial, Industrial, and Institutional/other uses. The historical percentage of water use for each type of use is shown in Table 2-4. These percentages include the Union area. It should be noted that the commercial water use percentage also includes multi-unit apartment buildings.

TABLE 2-4
PERCENT WATER USE BY TYPE OF USE

Type of water use	Residential	Commercial	Industrial
2015	83.4%	16.5%	0.1%
2016	86.7%	13.2%	0.1%
2017	86.5%	12.6%	0.9%
2018	86.5%	12.5%	01%
2019	88.2%	11.1%	0.7%
2020	87.5%	11.5%	01%
2021	87.6%	11.4%	01%
2022	87.8%	11.3%	0.9%
2023	88.2%	10.9%	0.9%

Table 2-5 compares the water supplied to the Midvale City drinking water system to the metered water use for the years 2015 through 2023. About 9% of the water supplied by the City's drinking water sources was unaccounted for in 2023. Possible explanations for the unaccounted water use include leaks in the distribution system, meter inaccuracies, and miscellaneous unmetered water use (such as pipeline flushing, etc.).

TABLE 2-5
COMPARISON OF WATER SUPPLIED TO METERED WATER USE

Year	Supplied Water (ac-ft)	Metered Water Use (ac-ft)	Percent Difference
2015	5,492	4,831.0	-12%
2016	5,357	5,173.0	-3.4%
2017	5,297	5,065.0	-4.4%
2018	5,633	5,261.0	-6.6%
2019	5,688	4,856.0	-14.6%
2020	6,908	6,266.0	-9.3%
2021	5,947	5,384.6	-9.5%
2022	6,078	5,194.0	-14.5%
2023	5,911	5,222.0	-11.7%

Existing and Future Water Use

If current water conservation efforts can be maintained into the future, it will save the City about 3,630 ac-ft/year of required build-out water supply compared to their 1995 water use rates. Water losses in the system were low, but if water losses could be reduced to 4%, the estimated additional water savings at build-out would be about 360 ac-ft/year.

The city recently had a consultant review its current and future buildout source requirements. It was determined that current sources exceed buildout requirements and that no new sources will be required, especially if water conservation efforts continue.

Water Metering and Pipeline Replacement

Midvale City currently meters water use at all connections and reads meters on a monthly basis. Midvale City has replaced all water meters within the water system with radio-read meters within the past 10 years and continues to monitor and replace meters throughout the city as they become older and defective.

Midvale City has a current program to replace and/or upsize old or undersized water pipelines in streets that need to be re-constructed. Old or undersized pipelines have been and will be identified for replacement in the City's Water System Master Plan. These projects are implemented as City budget allows. The city also regularly replaces old water service laterals with new copper or poly lines as pipeline projects are constructed.

Current Water Structure

Midvale City's drinking water rate structure is summarized in Table 3-1. The city has different rates for nine-meter sizes in three different areas. Rates are evaluated regularly and adjusted for fiscal and water conservation needs.

TABLE 3-1

WATER RATE STRUCTURE 2024

Meter Size	Area #1	Area #2	Area #3
Base Rate			
3/4 ”- 5/8’’	**24.46**	**25.81**	**26.34**
1”	**34.24**	**36.12**	**36.87**
1.5”	**44.03**	**46.46**	**47.42**
2”	**70.91**	**74.81**	**76.36**
3”	**268.67**	**283.77**	**289.63**
4”	**342.32**	**361.15**	**368.61**
6”	**513.15**	**541.75**	**552.95**
8”	**709.38**	**748.4**	**763.86**

Identified Problems

Midvale City is concerned with the potential waste of water from inefficient indoor/outdoor water use and from system wide losses. The following specific concerns have been identified by the city:

- Many pipes in the drinking water distribution system are old, undersized, and may be leaking.
- The city has adopted an annually increasing rate structure with higher overage charges for peak usage times.
- Comparison of the water supplied to the distribution system and the monthly meter readings has revealed water that is unaccounted for.
- The city currently has no estimates for the amount of water used during fire hydrant tests and distribution system flushing.

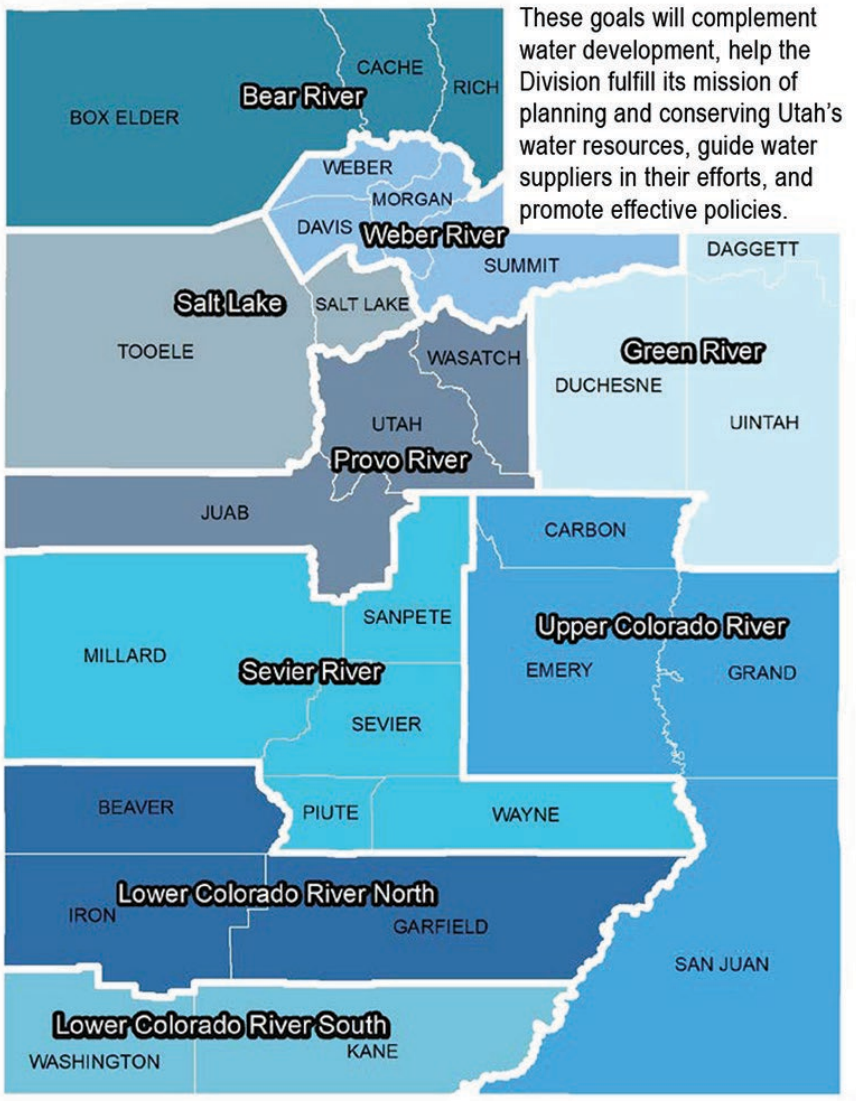
Goals

State regional water conservation goals:

The state's Regional Water Conservation Goals, established in 2019, are for Utah's nine municipal and industrial (M&I) areas. M&I includes residential, commercial, institutional (for example, schools and parks) and industrial water use, but excludes agriculture, mining, and power generation as these are classified individually.

As recommended by the 2015 Legislative Audit, 2017 Follow-up Audit, Third-Party Review, and 2017 Recommended State Water Strategy, regional water conservation goals were developed to enhance water conservation efforts around the state. Region-specific goals support the unique characteristics and needs of Utah's diverse climates and ecosystems.

Thanks to the efforts of many Utahns and their water providers, per capita water use has declined by at least 18%. We've made significant progress, but more must be done to accomplish these goals including policy and ordinance changes on state, local and municipal levels. Even with all the progress that has been made, balanced efforts both in water development and water conservation are still necessary to meet Utah's long-term water needs. This is the first-time conservation goals have been established on a regional level and they build on the previously established statewide goal of reducing per-capita use by 25% by 2025, (using the 2000 M&I water use report as a starting value).

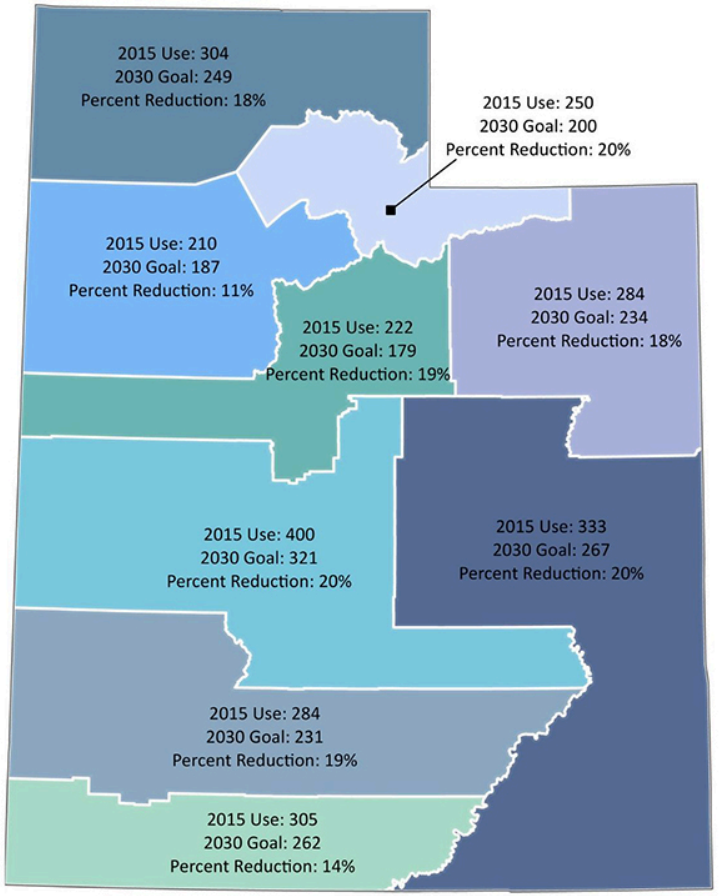


Midvale City's goal:

Midvale City has reached the state-wide goal of reducing their Per capita water consumption by 25%. A goal was also set in 2015 for each city in Salt Lake County to be below 187 GPCD. Midvale City currently has a gallon per capita daily water use of 148 based on current US Census data. Even though Midvale has completed both state goals and the new regional goal set in place in 2019 they will continue to promote conservation with a goal to reduce their per capita use by 11% aligning with the regional goal to reduce per capita use by 11%. Bringing Midvale City's GPCD to roughly 131.72 GPCD.

Midvale City believes that water conservation is an important factor for allowing the city to meet water demands into the future. Although the City has not appointed a separate water conservation coordinator, staff is aware of the conservation goals and work together to implement the goals. Water conservation efforts are coordinated by:

Wesley Vanvalkenburg
Midvale City Public Utilities Manager
801-567-7235



A regional approach allows the goals to be tailored for nine different regions and takes into account climate, elevation, and each region's characteristics. Note: Use is measured in gallons per capita per day.

Midvale City Existing Conservation Measures

Public Education:

Midvale City actively promotes water conservation measures to its residents through multiple channels, ensuring a comprehensive approach to sustainability. The city's website serves as a central hub, offering detailed guidelines, tips, and resources on efficient water usage and the importance of conservation. Annually, the city's water

quality report not only provides essential information about the safety and quality of the water supply but also includes practical advice on how residents can reduce their water consumption. Additionally, the city newsletter features regular articles and updates on water-saving initiatives and upcoming conservation workshops.

Require Water Saving Fixtures:

Midvale City has adopted the International Plumbing Code, mandating the use of water-saving plumbing fixtures in all new developments to enhance sustainability and resource efficiency. During the building permit review process, the city meticulously examines building plans to ensure they incorporate these water-efficient fixtures. Compliance with the code is further enforced through rigorous building inspections, ensuring that all new constructions adhere to these water conservation standards. This proactive approach not only promotes responsible water usage but also supports Midvale City's broader environmental goals.

Replace Old Water Service Laterals:

Midvale City has adopted a material standard aimed at improving the durability and efficiency of its water infrastructure by requiring that all leaking galvanized water laterals be replaced with copper or poly piping. This measure is part of the city's commitment to maintaining a reliable and sustainable water supply system. When a pipeline replacement project is conducted, any existing galvanized laterals are systematically replaced to prevent future leaks and ensure long-term resilience. By upgrading to copper or poly piping, Midvale City not only enhances the overall quality of its water distribution network but also reduces maintenance costs and water loss.

Replacement Program for Old Pipelines:

Midvale City is committed to the ongoing improvement of its water infrastructure by aiming to replace 1,000 feet of pipeline annually. This systematic approach is aligned with the city's master plan, ensuring that pipeline replacement projects are strategically conducted in conjunction with street renovations, as leaks are detected, and as the annual budget permits. By integrating pipeline replacements with broader infrastructure projects, Midvale City maximizes efficiency and minimizes disruption to residents. This proactive replacement strategy not only helps maintain a reliable water distribution system but also supports its broader water conservation goals by reducing leaks and water loss, thereby ensuring a more sustainable and efficient use of water resources for the community.

Replacement Program of Old Water Meters:

Midvale City has implemented a comprehensive meter replacement program to enhance the accuracy and efficiency of water usage monitoring. New, accurate radio-read meters are installed at all connections, allowing for precise data collection. During monthly meter scans, the city identifies meters with continuous flow, indicating potential leaks, and promptly contacts the respective residents. Meters showing abnormally high usage are also flagged, with residents being

notified to address possible issues. Additionally, meters registering zero flow are noted, and if found to be broken or inaccurate, they are promptly replaced. This diligent monitoring and proactive replacement approach ensures accurate billing and reduces water waste.

Restrict Water Use for Public Landscaped Areas:

Midvale City enforces water use restrictions for public landscaped areas to promote efficient water usage and conservation. Sprinkler systems are carefully adjusted based on current weather conditions, ensuring that landscapes receive the appropriate amount of water without waste. Watering is scheduled for the evening or early morning hours to minimize water loss due to evaporation, maximizing the effectiveness of irrigation. This strategic approach not only conserves water but also helps maintain the health of public green spaces.

Require Separate Meters for Large Irrigated Areas:

Midvale City mandates the installation of separate meters for large, irrigated areas in commercial and industrial properties. This requirement ensures that water usage for landscaping is distinctly monitored, promoting responsible water management practices. By isolating irrigation water consumption, the city can more accurately track and manage water usage, encouraging businesses to adopt efficient irrigation techniques. This policy not only aids in identifying potential leaks and inefficiencies but also aligns with Midvale City's water conservation plan, ensuring that commercial and industrial landscape areas are maintained without compromising valuable water resources.

Evaluate Water Rate Structure:

Midvale City conducts an annual evaluation of its water rate structure to promote water conservation and ensure the sustainability of its water resources. By reviewing and adjusting the rates each year, the city aims to incentivize efficient water usage among residents and businesses. The rate structure is designed to reflect the true cost of water provision and to encourage conservation by implementing tiered pricing, where higher usage results in higher rates. This annual assessment allows the city to adapt to changing water supply conditions, economic factors, and consumption patterns, reinforcing its commitment to responsible water management and the long-term preservation of this vital resource.

Proposed Conservation Measures

The following specific conservation goals have been identified by the city to help continue to promote conservation. Some of these goals were previously implemented but are being updated with additional information to align with future conservation goals.

Public Education: Updated Annually

Midvale City remains committed to promoting water conservation measures among its residents through ongoing public education initiatives. In alignment with the newly adopted Jordan Valley Water Conservancy District conservation measures, the city will update all relevant information to ensure residents are well-informed and equipped to conserve water effectively. This commitment extends to advertising conservation measures by providing convenient access to water conservation websites through links on the city website. As part of these efforts, the city will continue public education campaigns, encouraging customers to limit outside watering to the hours of 6 pm to 10 am. This information will be reviewed and updated annually.

Unmetered Connections and Water Use: Conducted Monthly

The city will undertake efforts to identify potential causes of unmetered or unaccounted for drinking water. Investigation and analysis conducted monthly based on meter reading data, Midvale City aims to pinpoint areas where water may be escaping the metering system or being lost through leaks or other means. Additional Hydrant meters will be purchased to help account for water used during fire hydrant flushing. By addressing these issues proactively, the city can mitigate water loss, conserve resources, and ensure efficient distribution of safe drinking water to residents and businesses. This will be reviewed and updated monthly.

Pipeline Repairs: Conducted Upon Discovery of Leak

Midvale City is committed to promptly replacing leaking pipelines as they are discovered to minimize water loss and ensure the efficient delivery of clean water to residents. The city prioritizes replacement of leaking water pipes to minimize environmental impact and conserve resources. This will be conducted upon the discovery of a leak and processes will be reviewed and revised annually.

Jordan Valley Water Conservancy District Conservation Measures

As of 2024 Midvale City adopted the Jordan Valley Water Conservancy District (JVWCD) conservation measures allowing all Midvale City residents the ability to utilize the conservation measures implemented by JVWCD in conjunction with the conservation efforts enforced by Midvale City. A summary of JVWCD efforts are included below or can be found at **https://jvwcd.org/public/conservation**

Free Water Audits:

JVWCD offers free water audits upon request for residential, commercial, industrial, or institutional water users. These audits involve a thorough examination of the sprinkling system and landscaping to identify opportunities for increasing irrigation efficiency and promoting conservation. By providing this service, JVWCD aims to empower water users with the knowledge and tools necessary to minimize water waste and optimize usage practices.

Water-Wise Landscaping Classes:

JVWCD provides Water-Wise Landscaping Classes tailored for both residential and commercial water users, emphasizing principles of water conservation. These classes offer participants valuable insights into sustainable landscaping practices that can significantly reduce water consumption while maintaining attractive and healthy outdoor spaces.

Large Water User Workshops:

JVWCD hosts Large Water User Workshops tailored for entities with extensive outdoor water usage, such as public schools, churches, parks and recreation areas, and municipalities. These workshops equip participants with practical tools and strategies for effectively managing large, landscaped areas while minimizing water consumption. By offering guidance on irrigation best practices, water-efficient landscaping techniques, and innovative water management technologies, JVWCD supports large water users in optimizing their operations for sustainability. These workshops serve as collaborative platforms for sharing knowledge, fostering partnerships, and collectively advancing water conservation efforts within the community.

Water Quest – Saving Water by the Yard:

This program showcases water-wise landscaping practices through the transformation of four residential homes across the Salt Lake Valley. These homes serve as living examples of sustainable landscaping in a residential setting, illustrating how water-efficient designs can enhance curb appeal while conserving water. With before-and-after photos featured on the JVWCD website, these demonstration gardens provide tangible inspiration and practical insights for homeowners looking to reduce their outdoor water usage.

Residential Landscape Incentives:

Homeowners in Jordan Valley's service area are eligible for up to $3.00 per square foot of lawn removed.

Commercial/Industrial/Institutional Incentives:

Businesses, institutions (including municipalities), and HOAs can now apply for incentives through Utah Water Savers. Visit https://utahwatersavers.com today to create an account and start saving!

Implementation Summary

Even though Midvale City has completed both state goals and the new regional goal set in place in 2019 Midvale will continue to promote conservation with a goal to reduce the 2023 148-gallon per capita daily use by 11% by 2030. This goal will be achieved by implementing the proposed conservation measures and educating city residents about Jordan Valley Water Conservancy District conservation measures that are now available to them. Conservation measures will be evaluated annually. An annual water use report will be pulled each year to track the progress of decreasing the Midvale City 2023 GPCD use by 11%. This goal will align with the Salt Lake regional goal to reduce per capita use by 11%. Midvale City's Council and staff are dedicated to achieving the established objectives and ensuring that necessary actions are implemented. Midvale City will establish a realistic timeline for each project to ensure that targets are met within the specified timeframe. Midvale City will also continue to revise the plan to ensure it adapts to evolving conditions and requirements within the City. This plan will be updated and resubmitted to the Utah Division of Water Resources when it is scheduled for submission.

APPENDIX A
PUBLIC EDUCATION MATERIALS

Ten ways that will save the most:

1. Water your lawn only when it needs it. Step on your grass. If it springs back when you lift your foot, it doesn't need water. So set your sprinklers for more day's in-between watering. Saves 750-1,500 gallons per month.
2. Fix leaky faucets and plumbing joints. Saves 20 gallons per day for every leak stopped.
3. Don't run the hose while washing your car. Use a bucket of water and a quick hose rinse at the end. Saves 150 gallons each time. For a two-car family that's up to 1,200 gallons a month.
4. Install water-saving shower heads or flow restrictors. Saves 500 to 800 gallons per month.
5. Run only full loads in the washing machine and dishwasher. Saves 300 to 800 gallons per month.
6. Shorten your showers. Even a one- or two-minute reduction can save up to 700 gallons per month.
7. Use a broom instead of a hose to clean driveways and sidewalks. Saves 150 gallons or more each time.
8. Don't use your toilet as an ashtray or wastebasket. Saves 400 to 600 gallons per month.
9. Capture tap water. While you wait for hot water to come down the pipes, catch the flow in a watering can use later on houseplants or your garden. Saves 200 to 300 gallons per month.
10. Don't water the sidewalks, driveway or gutter. Adjust your sprinklers so that water lands on your lawn or garden where it belongs--and only there. Saves 500 gallons per month.

In the bathroom:

1. Put a plastic bottle or a plastic bag weighted with pebbles and filled with water in your toilet tank. Displacing water in this manner allows you to use less water in each flush. (Don't use bricks, they decompose and can stain the toilet) Better yet, for even greater savings, replace your water-guzzling five to seven gallon a flush toilet with a three and a half gallon, low flush or one and a half gallon, ultra-low flush model.
2. Check toilet for leaks. Put dye tablets or food coloring in the tank. If color appears in the bowl without flushing, there's a leak that should be repaired.
3. Turn off the water while brushing your teeth.
4. Turn off the water while shaving. Fill the bottom of the sink with a few inches of water to rinse your razor.

In the kitchen and laundry:

1. If you wash dishes by hand, don't leave the water running for rinsing. If you have two sinks, fill one with rinse water. If you only have one sink, use a spray device or short blasts instead of letting the water run.
2. When washing dishes by hand, use the least amount of detergent possible. This minimizes rinse water needed.
3. Keep a container of drinking water in the refrigerator. This eliminates the need to run the tap water until it gets cold.

4. Don't defrost frozen foods with running water. Either plan ahead by placing frozen items in the refrigerator overnight or defrost them in the microwave.
5. Don't let the faucet run while you clean vegetables. Rinse them in a filled sink or pan.
6. Use the garbage disposal sparingly.

Outside:

1. Put a layer of mulch around trees and plants. Chunks of bark, peat moss or gravel slows down evaporation.
2. Water during the cool parts of the day.
3. Don't water the lawn on windy days. There is too much evaporation.
4. Cut down watering on cool and overcast days and don't water in the rain. Adjust or deactivate automatic sprinklers
5. Set lawn mower height to 2 1/2 to 3 inches. This promotes deeper roots and reduces evaporation.
6. Mow less frequently, this reduces the stress on turfgrass.
7. Sharpen mower blades. A cleaner cut grass blade heals quicker, thus less water.
8. Wash your car on the lawn. Rinse water can help water the grass.
9. Tell your children not to play with the garden hose.
10. Xeriscape--replace your lawn and high-water using plants with less thirsty ones. But do this only in early spring. Even drought tolerant plants take extra water to get them going.

ADDITIONAL WEBSITES PROMOTING WATER CONSERVATION:

- Jordan Valley Water conservation https://jvwcd.org/public/conservation
- Utah Water Savers https://www.utahwatersavers.com/
- Slow the flow https://slowtheflow.org/
- Conservation Garden Park https://conservationgardenpark.org/
- QWEL Workshops for landscape professionals https://www.qwel.net/
- Jordan Valley Water efficiency standards https://jvwcd.org/public/wes
- Utah division of water https://conservewater.utah.gov/

Appendix C

Midvale Drinking Water System Master Plan

MIDVALE CITY

DRINKING WATER SYSTEM MASTER PLAN

(HAL: Project No.: 141.43.100)

AUGUST 2020

HANSEN ALLEN & LUCE inc
ENGINEERS

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MIDVALE CITY

DRINKING WATER MASTER PLAN

(HAL Project No.: 141.43.100)

Katie Gibson Jacobsen, P.E.
Project Engineer

HANSEN ALLEN & LUCE inc
ENGINEERS

August 2020

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GLOSSARY OF TECHNICAL TERMS

Average Daily Flow: The average yearly demand volume expressed in a flow rate.

Average Yearly Demand: The volume of water used during an entire year.

Build-out: When the development density reaches maximum allowed by planned development.

Culinary Water: Water of sufficient quality for human consumption. Also referred to as Drinking or Potable water.

Demand: Required water flow rate or volume.

Distribution System: The network of pipes, valves and appurtenances contained within a water system.

Drinking Water: Water of sufficient quality for human consumption. Also referred to as culinary or Potable water.

Dynamic Pressure: The pressure exerted by water within the pipelines and other water system appurtenances when water is flowing through the system.

Equivalent Residential Connection: A measure used in comparing water demand from non-residential connections to residential connections.

Fire Flow Requirements: The rate of water delivery required to extinguish a particular fire. Usually it is given in rate of flow (gallons per minute) for a specific period of time (hours).

Head: A measure of the pressure in a distribution system that is exerted by the water. Head represents the height of the free water surface (or pressure reduction valve setting) above any point in the hydraulic system.

Head Loss: The amount of pressure lost in a distribution system under dynamic conditions due to the wall roughness and other physical characteristics of pipes in the system.

Peak Day: The day(s) of the year in which a maximum amount of water is used in a 24-hour period.

Peak Day Demand: The average daily flow required to meet the needs imposed on a water system during the peak day(s) of the year.

Peak Instantaneous Demand: The flow required to meet the needs imposed on a water system during maximum flow on a peak day.

Pressure Reducing Valve (PRV): A valve used to reduce excessive pressure in a water distribution system.

Pressure Zone: The area within a distribution system in which water pressure is maintained within specified limits.

Service Area: Typically, the area within the boundaries of the entity or entities that participate in the ownership, planning, design, construction, operation and maintenance of a water system.

Static Pressure: The pressure exerted by water within the pipelines and other water system appurtenances when water is not flowing through the system, i.e., during periods of little or no water use.

Storage Reservoir: A facility used to store, contain and protect Drinking water until it is needed by the customers of a water system. Also referred to as a Storage Tank.

Transmission Pipeline: A pipeline that transfers water from a source to a reservoir or from a reservoir to a distribution system.

ABBREVIATIONS AND UNITS

ac	acre [area]
ac-ft	acre-foot (1 ac-ft = 325,851 gal) [volume]
CFP	Capital Facilities Plan
DIP	Ductile Iron Pipe
EPA	U.S. Environmental Protection Agency
EPANET	EPA hydraulic network modeling software
ERC	Equivalent Residential Connection
ft	foot [length]
ft/s	feet per second [velocity]
gal	gallon [volume]
gpd	gallons per day [flow rate]
gpm	gallons per minute [flow rate]
HAL	Hansen, Allen & Luce, Inc.
hr	hour [time]
IFC	International Fire Code
in.	inch [length]
irr-ac	irrigated acre
kgal	thousand gallons [volume]
MG	million gallons [volume]
MGD	million gallons per day [flow rate]
mi	mile [length]
psi	pounds per square inch [pressure]
s	second [time]
SCADA	Supervisory Control and Data Acquisition
yr	year [time]

ACKNOWLEDGMENTS

Successful completion of this study was made possible by the cooperation and assistance of many individuals, including the Mayor of Midvale City, City Council Members, City Staff, and the Midvale Area Inspector as shown below. We sincerely appreciate the cooperation and assistance provided by these individuals.

Midvale City

Mayor

Robert Hale

City Council

Quinn Sperry
Paul Glover
Heidi Robinson
Bryant Brown
Dustin Gettel

City Staff

Lesley Burns, City Planner
Christopher Butte, Economic Development Director
Matt Dahl, Assistant City Manager
Keith Ludwig P.E., City Engineer
Glen Kennedy, Public Works Director
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Curtis Nielsen, Public Utilities Manager
David Stenquist, City Treasurer

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CHAPTER 1 INTRODUCTION

PURPOSE AND SCOPE

The purpose of this master plan is to provide direction to Midvale City regarding decisions that will be made now and well into the future to provide an adequate drinking water system for its customers at the most reasonable cost. Recommendations are based on demand data, growth projections, standards of the Utah Division of Drinking Water (DDW), city zoning, known and anticipated planned developments, and standard engineering practices. This master plan covers through approximately the year 2060, though full build-out is projected to occur beyond this time period. The service area considered in this master plan is the entire City of Midvale, as well as 45 acres located west of 700 West (Main Street) between approximately 8500 South and 9000 South that could be annexed into the City in the future.

The master plan is a study of the City's drinking water system and customer water use. The following topics are addressed herein: growth projections, source requirements, storage requirements, and distribution system requirements. Based on this study, needed capital improvements have been identified and conceptual-level cost estimates for the recommended improvements have been provided.

The results of the study are limited by the accuracy of growth projections, data provided by the City, and other assumptions used in preparing the study. It is expected that the City will review and update this master plan every 5–10 years as new information about development, system performance, or water use becomes available. This master plan updates the previous plan completed by the City of Midvale in October 2010.

BACKGROUND

Midvale City covers an area of approximately 5.8 square miles in the central area of Salt Lake County and shares borders with Murray City on the north, Sandy City on the south, the Cottonwood area on the east, and West Jordan City on the west. Water is supplied to Midvale City by two separate distribution networks.

The largest of the networks serves water to the western portion of Midvale and includes four wells (three active and one inactive), two water storage tanks, and two inter-agency connections with the Jordan Valley Water Conservancy District (JVWCD). A second network serves water to the Union Area of Midvale, located in the eastern portion of the City. The Union Area network is comprised of two pressure zones which receive water via inter-agency connections with JVWCD and also contains two inactive wells. A portion of this network was previously managed by JVWCD. In 2019, infrastructure projects were completed to allow Midvale to incorporate the former JVWCD retail network into the City's Union Area network.

The City drinking water supplies water for both indoor and outdoor use throughout the service area. There is no secondary/pressurized irrigation water system for outdoor use in the City, nor any significant outdoor watering supplied by irrigation companies.

Figure 1-1 illustrates the extent of the Midvale water system and presents a graphic description of system components. The West Midvale and Union Area pressure zones of the Midvale City water system contain a total of approximately 120 miles of distribution pipe ranging in size from 2 to 24 inches in diameter.

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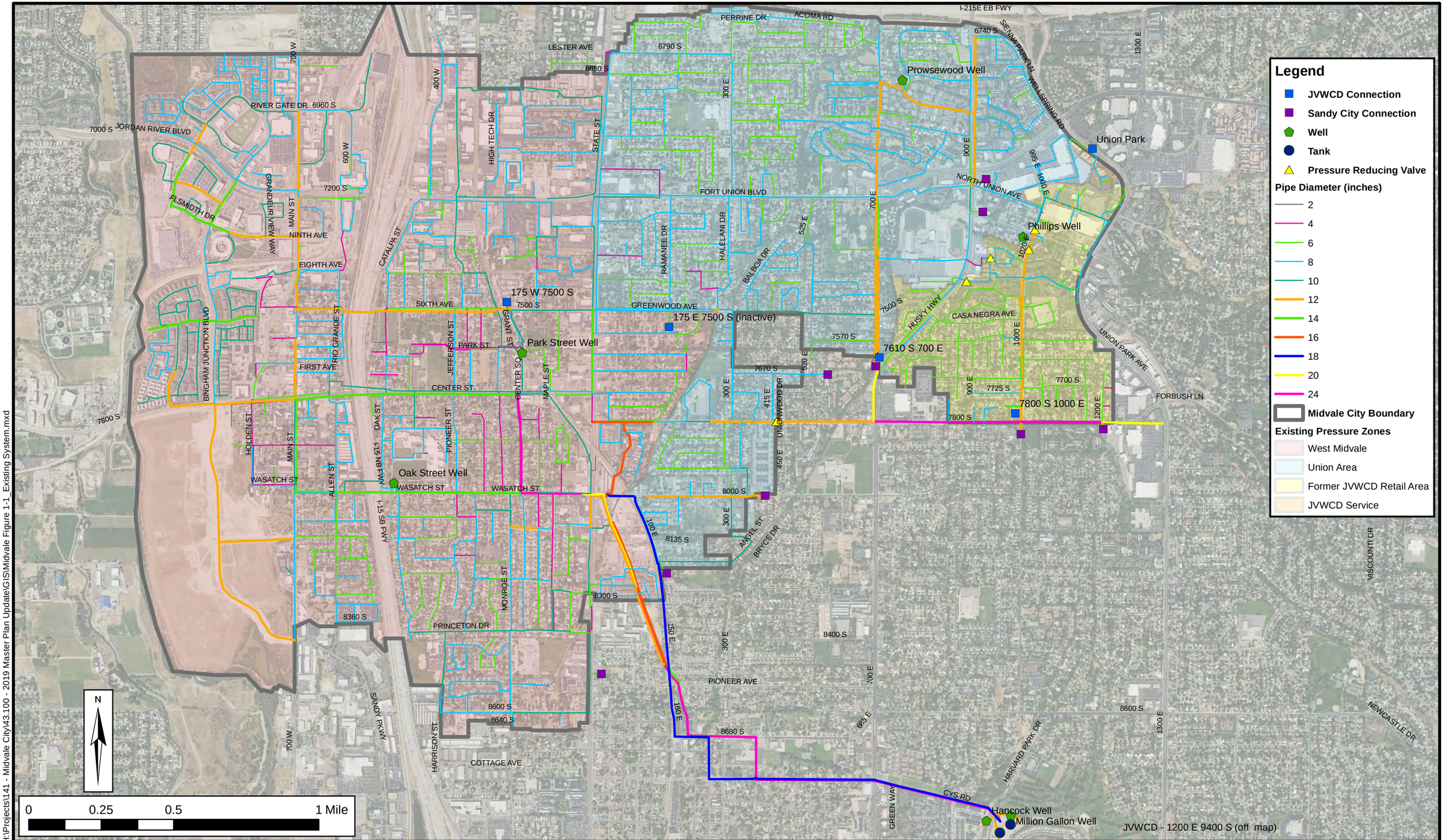

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MIDVALE CITY DRINKING WATER SYSTEM

EXISTING DRINKING WATER SYSTEM

FIGURE 1-1

Midvale includes a population of approximately 34,000 in 2020. Midvale includes 260 acres of undeveloped land in the Jordan Bluffs area (west of Main Street/700 West, south of Center Street/7800 South). City and State planners expect development of Jordan Bluffs, infill development, and redevelopment to increase the population of Midvale significantly over the next 40 or more years, reaching at least 60,000. Figure 1-2 shows the historic and projected population of Midvale through 2060. Additional detail is shown in Table A-1 in Appendix A. These growth estimates were generated using information from City records, the City Planning Department, and projections from the Governor's Office of Management and Budget (2012), Kem C. Gardner Institute (2016), and Wasatch Front Regional Council (2019).

The planning period of this master plan is through 2060, though Midvale may not reach its peak population by that time.

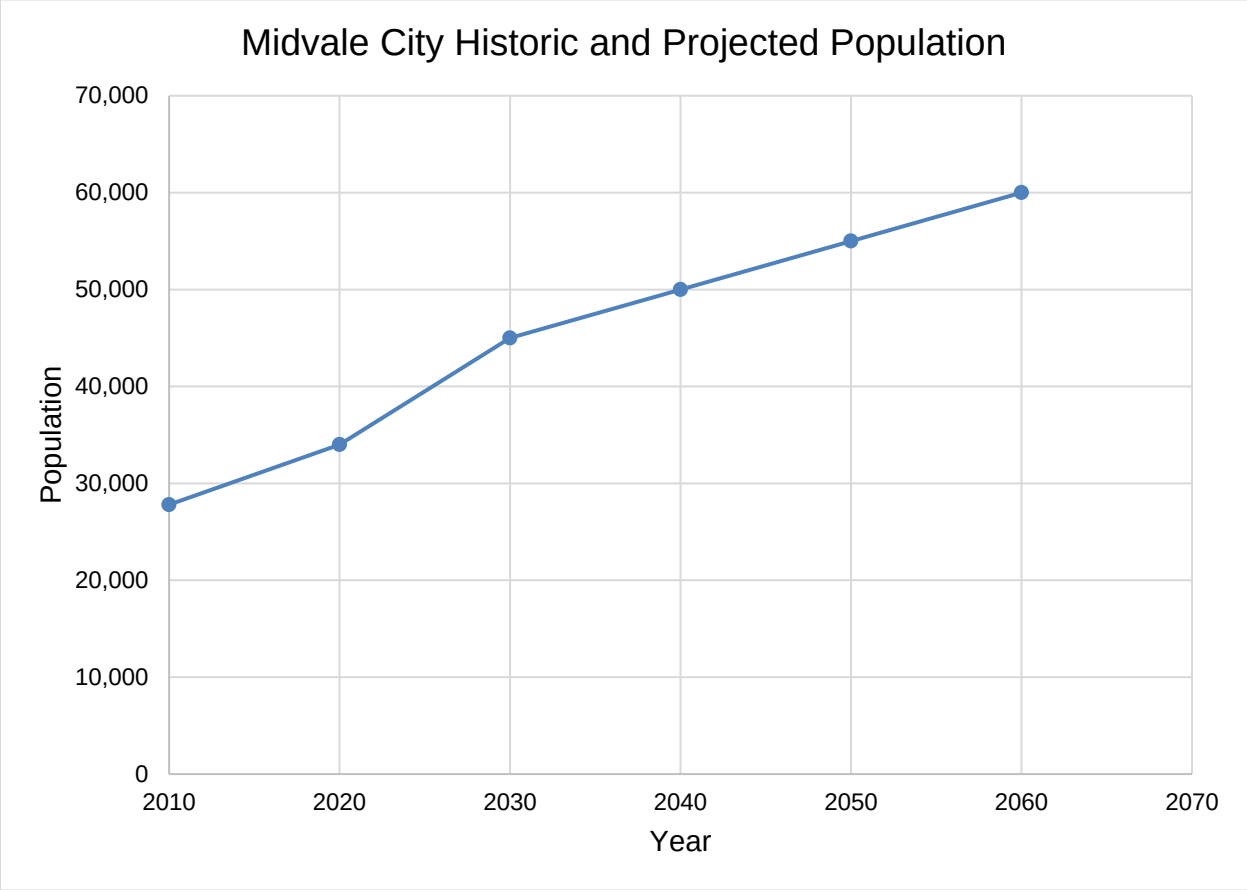

Figure 1-2: Midvale Historic and Projected Population

MASTER PLANNING APPROACH

The Midvale City water distribution network is made up of a variety of components, including pumps, storage facilities, valves, and pipes. Design and operation of the individual components must be coordinated so that they operate efficiently under a range of demands and conditions. The City water system must be capable of responding to daily and seasonal variations in demand while concurrently providing adequate capacity for fire-fighting and other emergency

needs. Furthermore, careful planning is required in order to ensure that the distribution system is capable of meeting the City's needs over the next several decades.

Both present and future needs were evaluated in this master plan. Present water needs were calculated using actual water production data and billing record data, according to Utah Division of Drinking Water (DDW) system-specific sizing requirements. These requirements were used to determine a responsible level of service for the system. Future water demands were predicted using this level of service, current zoning and expected development provided by the City, and future estimated population growth.

This report follows the DDW requirements of Rule R309-510 (“Facility Design and Operation: Minimum Sizing Requirements”) and Rule R309-105 (“Administration: General Responsibilities of Public Water Systems”) of the Utah Administrative Code. The report addresses sources, storage, distribution, minimum pressures, hydraulic modeling, capital improvements, funding, and other topics pertinent to Midvale’s drinking water system.

In order to facilitate the analysis of the drinking water system, a computer model of the system was prepared and analyzed in two parts. First, the performance of existing facilities with present water demands was analyzed. Next, projected future demands were added to the drinking water system and the analysis was repeated. Recommendations for system improvement were prepared based on the results of these analyses.

LEVEL OF SERVICE (LOS)

HAL analyzed production and billing data provided by Midvale City for the previous three years. Once water production and demand patterns were well understood, HAL and the City met to establish a level of service (LOS) that is based on this data, and incorporates appropriate safety factors. A summary of the level of service selected by the City is included in Table 1-1. These values are expected to meet the requirements of the DDW.

Table 1-1: System Level of Service

Criteria	Level of Service
Average Yearly Demand	0.56 ac-ft/ERC = 182,500 gal/ERC
Peak Day Demand	1,200 gpd/ERC = 0.83 gpm/ERC
Peak Instantaneous Demand	1.7 Peaking Factor = 1.42 gpm/ERC
Equalization Storage	500 gal/ERC

ERCs are equivalent residential connections, and are discussed in more detail in the next chapter of this report.

DESIGN AND PERFORMANCE CRITERIA

Summaries of the key design criteria and demand requirements for the drinking water system are included in Table 1-2. The design criteria were used in evaluating system performance and in recommending future improvements. Criteria development is described in later chapters.

Table 1-2: System Design Criteria

	Criteria	Existing	2060
Equivalent Residential Connections	Calculated from past water use and projected growth	13,940	23,580
Source			
Peak Day Demand	Section R309-510-7/LOS	11,570 gpm	19,570 gpm
Average Yearly Demand	Section R309-510-7/LOS	7,806 ac-ft	13,205 ac-ft
Storage			
Equalization	Section R309-501-8/LOS	7.0 MG	11.8 MG
Emergency	City Preference	1.5 MG	1.5 MG
Fire Suppression	IFC/Fire Code Official	2.3 MG	2.3 MG
Total		10.8 MG	15.6 MG
Distribution			
Peak Instantaneous	1.7x Peak Day Demand	19,669 gpm	33,269 gpm
Minimum Peak Day Fire Flow	IFC/ Fire Code Official		
Residential (typical)		1,000 gpm @ 20psi	1,000 gpm @ 20psi
Non-Residential		2,000 gpm @ 20 psi	2,000 gpm @ 20 psi
Max. Operating Pressure	City Preference	110 psi	110 psi
Minimum Pressure: Peak Day	Section R309-510-9/City Preference	40 psi/50 psi	40 psi/50 psi
Minimum Pressure: Peak Instantaneous	Section R309-510-9/City Preference	30 psi/50 psi	30 psi/50 psi

1 – Fire flow requirements are dependent on building size, construction type, and presence of approved sprinkling systems. The values shown here are typical minimums.

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CHAPTER 2 SYSTEM GROWTH

EXISTING CONNECTIONS

According to billing records obtained for years 2016 through 2019, the Midvale distribution network serves a total of 7,875 connections. Included in this number are 7,190 residential connections and 685 non-residential connections. Drinking water demands are expressed in terms of equivalent residential connections (ERCs), which for planning purposes are the same as equivalent residential units (ERUs). The use of ERCs is a standard engineering practice to describe the entire system in a common unit of measurement. One ERC is equal to the average demand of an average residential connection. Non-residential demands are converted to ERCs for planning purposes. For example, a commercial building requiring six times as much water as a typical residential connection is assigned an ERC of 6. The entire water demand then can be described with a single ERC count.

HAL extensively analyzed the City's water billing data from January 2016 through December 2018. Billing data from Midvale and JVWCD for all of 2019 was also obtained and used to estimate the number of ERCs added to the Midvale system when Midvale took over a portion of the JVWCD network in 2019. It was determined that the existing system serves 13,940 ERCs.

ERCs representing demands were assigned to nodes within the extended-period hydraulic model based on the billing location. A breakdown of the existing ERCs by pressure zone is shown in Table 2-1.

A primary recommendation of this master plan is to combine the majority of the City into one large pressure zone. The portion of the City in the Union area east of 700 East/900 East will be divided into two additional small zones. Figure 2-1, Recommended Pressure Zones, located at the end of this chapter, shows the recommended new pressure zones. Projects will be required to connect piping across the former zone boundaries. Some valves will be closed to create the new zone boundaries. Pressure and flow settings at JVWCD connections will need to be adjusted. Details of these projects are discussed in Chapter 5, Water Distribution.

Table 2-1 includes the ERC breakdown for the new pressure zones. All remaining tables, charts, and figures in this report will use the recommended new pressure zones.

Table 2-1: Existing ERCs by Pressure Zone

Existing Pressure Zones		Recommended Pressure Zones	
Zone Name	**ERCs**	**Zone Name**	**ERCs**
West Midvale	7,135	Midvale	11,970
Union Area – North/West	5,490	North Union	630
Union Area – East/South	1,315	South Union	1,340
Total	**13,940**	**Total**	**13,940**

FUTURE CONNECTIONS

Future ERCs were calculated based on proposed development, land use patterns, zoning, and densities allowed by City code or possible in the future. Most of the remaining undeveloped land in Midvale is located in the 260-acre Jordan Bluffs area. City planners expect to see additional development at other locations throughout the City, including within Bingham Junction, near the Fort Union Shopping Area, along State Street and 7200 South, and in transit-oriented development zones. Infill development is possible on small pockets of land throughout the city. The remaining projected growth will likely take place through redevelopment in future decades. All projected growth is expected to be at higher densities than past development has typically been. The level of development expected by 2060 is significantly more than the buildout level of development expected in past master planning efforts.

Water usage for future development was based on existing usage for those same development types, as shown in Table 2-2.

Table 2-2: Water Usage of Future Development Types

Development Type	Usage
Office Buildings	25 ERCs per 100,000 SF
Retail	30 ERCs per 100,000 SF
Hotel	0.3 ERCs per room
Medium to High-Density Residential	0.5 ERCs per unit

Future ERCs were distributed as shown in Table 2-3.

Table 2-3: Future ERCs by Development Location or Type

Development Location or Type	ERCs
Jordan Bluffs area	2,130
Bingham Junction area	275
Fort Union Shopping area	840
8500-9000 S Annexation area	400
Transit-oriented development zones	660
7200 South/State Street area	120
Infill/vacant parcels	1,185
Redevelopment	4,030
Total	**9,640**

These future ERCs were assigned to the proposed pressure zones as shown in Table 2-4 in the "Added" column. This table also shows the existing ERCs and total number of ERCs in each proposed pressure zone in 2060.

Table 2-4: Existing, Added, and Total 2060 ERCs by Pressure Zone

Zone Name	Existing	Added	Total
Midvale	11,970	8,290	20,260
North Union	630	725	1,355
South Union	1,340	625	1,965
Total	**13,940**	**9,640**	**23,580**

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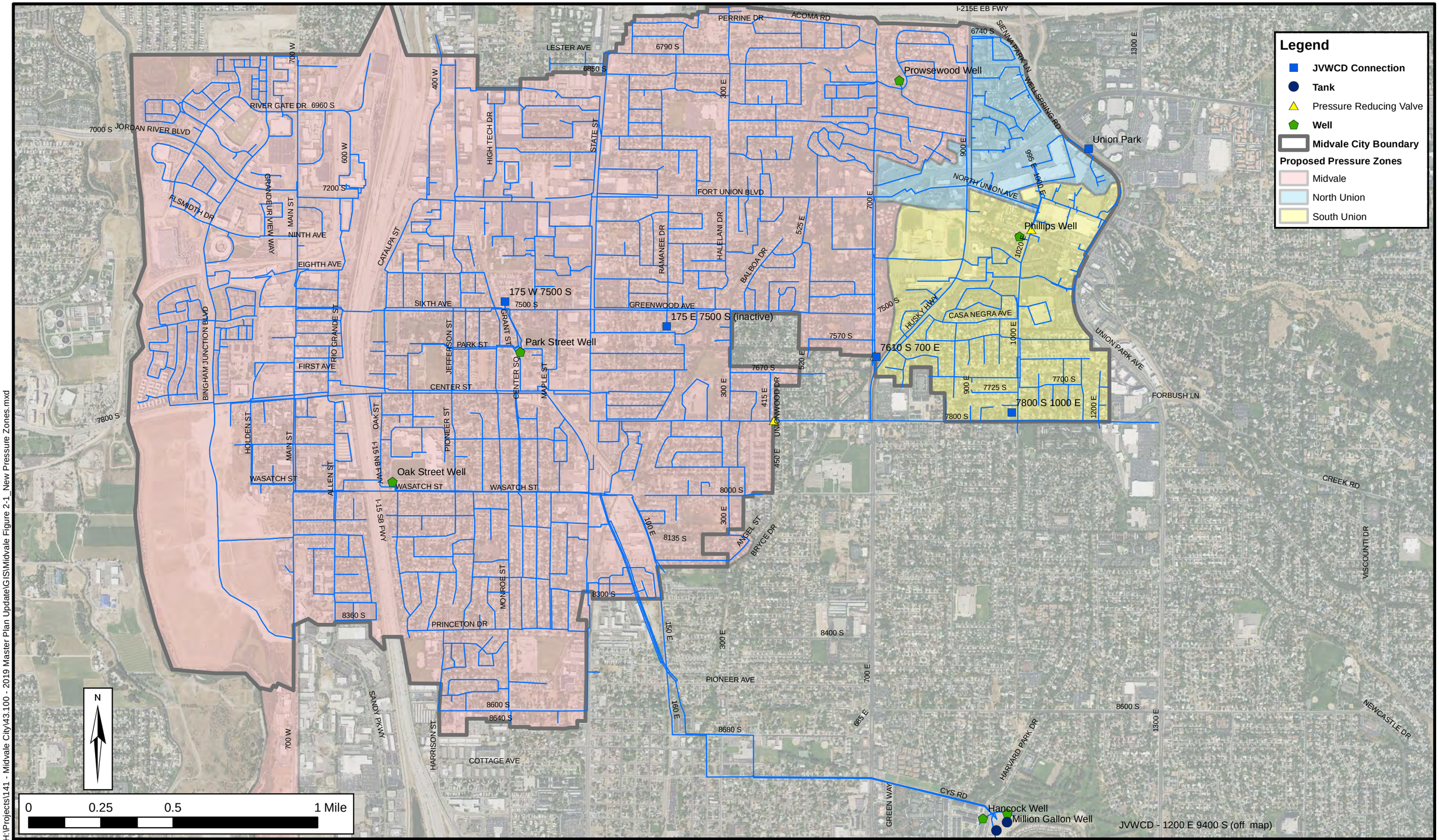

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MIDVALE CITY DRINKING WATER SYSTEM

RECOMMENDED NEW PRESSURE ZONES

FIGURE 2-1

CHAPTER 3 WATER SOURCES AND WATER RIGHTS

EXISTING WATER SOURCES

Midvale City owns six wells, including Hancock, Million Gallon, Oak Street, Park Street, Phillips, and Prowswood. The Phillips, Prowswood, and Park Street wells are currently inactive. Midvale also receives water from JVWCD at four locations. Midvale's sources are summarized in Table 3-1 and shown on Figure 1-1.

Table 3-1: Existing Drinking Water Sources

Source	Zone	Capacity (gpm)
Well Sources		
Hancock Well	Midvale	1,950
Million Gallon Well	Midvale	2,150
Oak Street Well[1]	Midvale	1,200
Park Street Well	Midvale	Inactive
Phillips Well	North Union	Inactive
Prowswood Well	Midvale	Inactive
Total Well Sources		**5,300**
JVWCD Sources		
JVWCD 175 W 7500 S	Midvale	1,000
JVWCD 1200 E 9400 S	Midvale	1,000
JVWCD 7610 S 700 E	Midvale	4,500
JVWCD 1000 E 7800 S	South Union	2,500
Total JVWCD Sources		**9,000**
Total		**14,300**

1 – The Oak Street well has been capable of pumping up to 1,200 gpm but is currently pumping 800 gpm.

Table 3-2 summarizes the existing drinking water sources by pressure zone using the new recommended pressure zones.

Table 3-2: Existing Drinking Water Sources by Pressure Zone

Zone	Capacity (gpm)
Midvale	11,800 gpm
North Union/South Union	2,500 gpm
Total	**14,300 gpm**

The current contract amount available to Midvale from JVWCD is 3,085 acre-feet.

Midvale's system includes inactive interconnections to the Sandy City network. These connections could be used in case of emergency, but are not considered as a Midvale City source.

WATER RIGHTS

A summary of Midvale City's water rights is shown in Table 3-3. In 2019-2020, an adjudication was performed for all Midvale water rights and volumetric restrictions were added to all of the rights that did not already have one. These are reflected in the table. Four of the water rights were solely used in the Phillips, Prowswood, or Park Street wells. Three of the change applications to add the Oak Street well as a point of diversion for these rights were approved and one is still under evaluation. These are indicated in the table.

Table 3-3: Summary of Midvale Water Rights

Water Right Number	Flow cfs (gpm)	Volume acre-feet	Status	Use	Time of Use	Point of Diversion
57-1008	0.61 (274)	118.5	Approved Change Application	Municipal	Jan-Dec	Park, Oak
57-1398	2.20 (987)	126.0	Certificated	Municipal	Jan-Dec	Park, Oak, Million Gallon, Hancock
57-2251	4.47 (2006)	3236.13	Certificated	Municipal	Jan-Dec	Park, Oak, Million Gallon, Hancock
57-3066	1.158 (520)	838.39	Approved Change Application	Municipal	Jan-Dec	Phillips, Oak
57-7909	0.64 (287)	158.50	Certificated	Municipal	Jan-Dec	Million Gallon
57-8248	0.178 (80)	44.00	Approved Change Application	Municipal	Jan-Dec	Prowswood, Oak
57-8505	1.27 (570)	430.20	Unevaluated Change Application	Municipal	Jan-Dec	Prowswood, Oak
57-1492	0.50 (224)	58.438	Certificated	Irrigation Stockwater Domestic	Apr 1-Dec 1 Jan-Dec Jan-Dec	Near 7200 S Cottonwood St.
57-1738	0.056 (25)	6.44	Certificated	Irrigation Stockwater Domestic	Apr 1-Dec 1 Jan-Dec Jan-Dec	Near 7200 S Cottonwood St.
57-2699	0.348 (156)	7.76	Certificated	Stockwater Domestic Commercial	Jan-Dec Jan-Dec Jan-Dec	8200 South Main Street
Total	**11.43 (5,130)**	**5,024**				

The water rights in Table 3-3 sum to 11.43 cfs (5,130 gpm) with an annual limitation of 5,024 acre-feet. However, if only the water rights related to domestic uses are considered, 57-1492, 57-1738, and 57-2699 are removed from consideration. These three water rights total 0.904 cfs (406 gpm) with an annual limitation of 72.6 acre-feet. After removing the water rights that are not available for municipal use, 10.526 cfs (4,724 gpm) with an annual limitation of 4,952 acre-feet remain. This is summarized in Table 3-4.

The point of diversion for water right 57-2699 is located at the City's public works building property, within the Central Region of the Salt Lake Valley Groundwater Management Plan. The Plan is included in Appendix B. The City wells are located in the Eastern Region. Water rights cannot be transferred from the Central region to the existing City wells in the Eastern Region. In addition, the Sharon Steel Restricted Area and the Southwest Remediation Area (Kennecott) are located to the west of the existing point of diversion for right 57-2699. It may be challenging to find a point of beneficial use for this water right within the Central Region. The City may be able to install equipment to use the water at the Public Works property for washing, irrigation, or other similar uses. When a beneficial use is identified, a change application should be filed to change the usage type to municipal. The water right could also be transferred to the Northern Region and exchanged for a right that is usable by the City.

Water right numbers 57-1738 and 57-1492 have the same authorized point of diversion in the Eastern Region (near 7200 South Cottonwood Street). A change application could be filed to move this water to the Oak Street Well. The point of diversion is no longer in use, but at the time of evaluation by the State Engineer in March 2019 as part of the ongoing adjudication, the beneficial use requirement was excused as a condition of being owned by a public water supplier consistent with Utah Code. These water rights are limited to the annual withdrawal of 64.878 acre-feet.

Table 3-4: Water Rights for Municipal Use

Water Rights	Flow Limitation		Volumetric Limitation
	cfs	gpm	acre-feet
All	11.43	5,130	5,024
Not available for domestic use	0.904	406	72.6
Available for domestic use	10.526	4,724	4,952

Because the water rights for the recently approved change applications are in an active adjudication area, the City can elect to have the applications proofed as part of the adjudication. It is recommended the City elect to do this for as much water as they have beneficial use in place.

The Division of Water Rights (DWRi) requires the City to have measuring and totalizing recording devices to meter all water diverted from all sources and to report this data to the DWRi Water Use Program each year.

All of the municipal water rights discussed are available for use in the new larger Midvale pressure zone. Rights associated with the Phillips well could be used in the North Union and South Union pressure zones, but the City does not plan to use the well to supply these zones.

WATER RIGHTS LIMITATIONS

The following tables summarize the water rights that can be used for each well. Table 3-5 is a mass balance based on instantaneous flow rate limitations and Table 3-6 is based on annual volumetric limitations. The values in the table show a possible mass balancing of the water rights. Because several of the water rights have multiple points of diversion, the rights could be assigned in other ways. These examples are based on the current typical operations of the wells.

Table 3-5: Water Rights for Midvale City Wells – Instantaneous Flow Limitation

Water Rights and Limitations		Well (Physical Capacity, gpm)					
Number	Flow (gpm)	Hancock 1,950	Mill. Gal. 2,150	Oak St. 800-1,200	Park St. (inactive)	Phillips (inactive)	Prowswood (inactive)
57-1008	274			274			
57-1398	987	-	987	-			
57-2251	2006	1,280	726	-			
57-3066	520			520			
57-7909	287		287				
57-8248	80			80			
57-8505	570			570			
Flow Rate Used by Water Right (gpm)		**3,280**		**1,444**	**0**	**0**	**0**
Remaining Well Flow Capac. (gpm)		**820**		**-244 to -644**	**0**	**0**	**0**

Based on flow rate limitations, the combined Hancock and Million Gallon wells are limited to 3,280 gpm. This would not allow both wells to be pumped simultaneously. This leaves 1,444 gpm available to be pumped at the Oak Street well. The Oak Street well is capable of pumping a maximum of 1,200 gpm, but typically pumps 800 gpm.

DWRi requires volumes used to be reported each year, and instantaneous flow rates used are not tracked. It is understood that the annual volumetric water right limitation is more critical than the instantaneous flow rate limitation. However, the wells could be limited to the instantaneous flow limitation if higher use causes excessive drawdown in nearby wells or if other water users are unable to withdraw their rightful flow rates from the aquifer in the future. Table 3-6 shows the volumetric limitations for each water right.

Table 3-6: Water Rights for Midvale City Wells – Annual Volumetric Limitation

Water Rights and Limitations		Well					
Number	Volume (acre-ft)	Hancock	Million Gallon	Oak Street	Park Street	Phillips	Prowswood
57-1008	118.5			118.5			
57-1398	126.0		126				
57-2251	3236.1	1750	1486.1				
57-3066	838.4			838.4			
57-7909	158.50		158.5				
57-8248	44.00			44			
57-8505	430.20			430.2			
Totals		1750	1770.6	1431.1	0	0	0
		3520.6		1431.1	0	0	0
		4951.7					

Using the active wells only, the total volume of 4,952 acre-feet is available to the Hancock, Million Gallon, and Oak Street wells. Of this, 1,431 acre-feet is available to the Oak Street well only. In Table 3-6, this full volume is assigned to Oak Street well. The Oak Street well would need to produce 887 gpm all year to use this volume of water rights. 158.5 acre-feet is available to the Million Gallon well only. The remaining 3,362 acre-feet is available to the Hancock, Million Gallon, and Oak Street wells. Table 3-6 shows the water rights used in the Oak Street well if it could be used all year at 887 gpm with the remainder of the water rights being used in the Hancock and Million Gallon wells, assigned approximately equally to the two wells.

In 2019, the City produced 5,660 acre-feet of water. This is lower than the volume expected to be used in 2020 and beyond because the City served the new JVWCD customers for less than half the year in 2019. The volume used in 2020 will likely increase because these customers will be served the full year. The calculated annual water right requirement presented in this report will nearly always be higher than the volume actually produced because the calculated requirement includes a variability factor and safety factor.

Of the 5,660 acre-feet used in 2019, 3,034 acre-feet was produced by City wells, and the remaining 2,626 acre-feet was purchased from JVWCD. Based on the existing pressure zones in the City, the City is likely incapable of using the entire available water right volume and will continue to underuse the available water rights and be required to supplement with significant volumes of JVWCD water. If the City adjusts the pressure zones as recommended in this master plan, the City can maximize the use of water from the City wells and reduce the amount required to be purchased from JVWCD. Upgrading the Oak Street pump/motor or redeveloping Oak Street well or Park Street well may be necessary in order to fully maximize use of the water rights available.

Because JVWCD water must be paid for whether it is used or not, the City should continue to use all contracted JVWCD water until the City's needs exceed the contract amount. The following example is based on 2019 usage, but these principles will benefit the City as the City's

water demands exceed the JVWCD contract amount. At that point, the City can then maximize the use of the City wells before increasing the JVWCD contract amount.

CAPACITY OF WELLS TO MEET DEMANDS – 2019 EXAMPLE WITH NEW PRESSURE ZONES

Based on production data for the three-year period covering April 2016 through March 2019, the City produces approximately 80% of the annual volume of water in April through October, and 20% of the annual volume in the remaining five months of the year.

The City wells are able to supply only the Midvale pressure zone (whether zone boundaries are changed or not) without a booster pump. Approximately 86% of the City's ERCs are located in the new recommended Midvale pressure zone. The remaining 14% of the City's ERCs are located in the new recommended North Union and South Union pressure zones. The new recommended zones are used in this example.

Table 3-7 calculates the average flow rates that were produced for current customers located in the new recommended pressure zones. This calculation is based on the 5,660 acre-feet produced in 2019. Approximately 5% production volume was added to account for the JVWCD customers being served less than half the year in 2019, resulting in an estimated total production volume of 5,960 acre-feet required to serve all current customers for the full year in 2019.

Table 3-7: Average Flow Rates Produced in 2019 with Proposed Pressure Zones

Zone	ERCs	Percent of ERCs	Production Volume (acre-feet)	April-October (213 days) 80% of production		Jan-Mar & Nov-Dec (152 days) 20% of production	
				Volume (acre-feet)	Avg Flow Rate (gpm)	Volume (acre-feet)	Avg Flow Rate (gpm)
Midvale	11,970	86%	5,125	4,100	4,356	1,025	1,526
North Union	630	14%	835	668	709	167	248
South Union	1,340						
Total	**13,940**		**5,960 ac-ft**	**4,768 ac-ft**	**5,065 gpm**	**1,192 ac-ft**	**1,775 gpm**
Total Volume				**5,960 acre-feet**			

As shown in the table, the approximate annual volume that would have been required for the recommended Midvale pressure zone is 5,125 acre-feet. Water rights available for domestic use is 4,952 acre-feet. As shown in Table 3-6, water rights totaling 3,520 acre-feet are available to be used by the Hancock well and Million Gallon well. An additional 1,431 acre-feet are available to be used in the Oak Street well.

The Oak Street well is currently producing approximately 800 gpm. At this flow rate, the 1,431 acre-feet annual volumetric limitation on the water right for this well will not be reached. The City should increase the production on this well to allow the full water right volume to be used. Approximately 887 gpm could be pumped all year to use the full volume of the available annual water right.

The Hancock and Million Gallon wells can provide 4,000 gpm when both are operational. If the Oak Street well is providing 800 gpm, the Hancock and Million Gallon wells could produce 3,560 gpm average (running approximately 21 hours each day) for more than 7 months before the volumetric water rights limitation is met. Water from JVWCD would then be used during the winter to supply the difference between demand and the volume produced by the Oak Street well.

In this 2019 example, the average summer flow rate required to be produced by the City wells is 4,356 gpm. The City wells should be able to provide this flow rate when all wells are in service. JVWCD water would be needed to provide the remaining required volume in the Union zones and to supplement flows if a well is out of service or if demands exceed the production capacity of the wells. In the winter, the average flow rate needed in the Midvale pressure zone was 1,526 gpm, which could be provided by the Oak Street well with supplementation from JVWCD or another well.

In this example, if the flow rate was increased at the Oak Street well, the City wells could be used to supply 4,952 acre feet of the City's annual requirement, using the full volume of the total available annual water rights. If the City desires to maximize the use of the City's water rights, use of the Oak Street well should be maximized all year to use as much of the water right as practical.

The City is charged for peaking from JVWCD connections, which is a concern during the summer. For this reason, it may be more beneficial to prioritize using JVWCD in the winter and reserving the full capacity of the city wells to meet peak demands in the summer. As noted previously, the full contracted volume of JVWCD water should be used each year because the City is required to pay for it whether it is used or not.

The above calculation is only an example based on 2019 production and requirements from year to year will vary. This demonstrates that if the new recommended pressure zones are used, the City will be able to use more City water rights by pumping from the City wells and reducing the volume required from JVWCD correspondingly. For years or months with higher demands than this example, and as development increases, the City will not be able to meet the requirements of the Midvale zone with only the City wells. Purchasing water from JVWCD to supply this zone will be required.

WATER RIGHTS RECOMMENDATIONS

By 2060, the City will require a minimum of 13,205 acre-feet of water rights to meet requirements for the drinking water system (see Table 3-15 in the next section of this report). Compared to the 4,952 acre-feet of existing water rights available, the City is deficient by 8,253 ac-ft. Similar to other components of the water system, water rights should have redundancy. Some water rights may not be able to be used as planned or do not yield the allowed flow. It is recommended that the City use the City wells as much as possible, up to the limits of the water rights, to show beneficial use of these rights. It is recommended that the City pursue opportunities to move the diversion point for water rights 57-1492, 57-1738, and 57-2699 to a location where these rights can be beneficially used in the drinking water system. If all City water rights can be used (5,024 acre-feet), the City will require **8,181 acre-feet** to be provided from JVWCD.

Water rights and JVWCD contract volumes should be evaluated yearly. It is recommended that the City set up a forecasting and tracking system to determine the recommended sources to use

each month to ensure that water rights are used to the maximum extent practical while remaining within limitations and minimizing costs.

EXISTING SOURCE WATER REQUIREMENTS

According to DDW standards (Section R309-510-7), water sources must be able to meet the expected water demand for two conditions. First, sources must be able to provide an adequate supply of water for the peak day demand (flow requirement). Second, sources must be able to produce a one-year supply of water, or the average yearly demand (volume requirement).

Peak day and average yearly demand are calculated using the level of service criteria shown in Table 1-1 of this report by computing the demand from water use data with a factor of safety for variance (Subsection R309-510-7(2)).

The level of service selected is based on the DDW standard, requiring minimum source and storage sizing to be based on system-specific analysis of three years of usage data. Because the DDW may recompute the requirements in the future, these values may vary, but should not increase significantly.

Existing Peak Day Demand

Peak day demand is the water demand on the day of the year with the highest water use. It is used to determine required source capacity under existing and future conditions. Based on the requirements shown in Table 1-1, the total peak day drinking water demand is 11,570 gpm (16.7 MGD), as shown in Table 3-8.

Table 3-8: Existing Peak Day Demand

ERCs	Peak Day Demand (gpm/ERC)	Total Peak Day Demand (gpm)
13,940	0.83	11,570

A breakdown of the existing peak day demand by pressure zone (using the new recommended pressure zones) is shown in Table 3-9. The table also shows the capacity available and remaining in each zone.

Table 3-9: Existing Source Requirements by Pressure Zone

Zone	ERCs	Demand (gpm)	Source Capacity in Zone (gpm)	
			Available	Remaining
Midvale	11,970	9,935	11,800	1,865
North Union	630	525	2,500	865
South Union	1,340	1,110		
Total	**13,940**	**11,570**	**14,300**	**2,730**

Approximately 2,730 gpm capacity is remaining in the system. This provides redundancy if one of the City's wells is out of service, but would not provide full redundancy if one of the larger JVWCD connections is out of service.

Existing Average Yearly Demand

Average yearly demand is the volume of water used during an entire year and is used to ensure the sources can supply enough volume to meet demand under existing and future conditions. Based on the requirements shown in Table 1-1, the total existing average yearly demand is 7,850 acre-feet, as shown in Table 3-10.

Table 3-10: Existing Average Yearly Demand

ERCs	Average Yearly Demand (ac-ft/ ERC)	Total Average Yearly Demand (ac-ft)
13,940	0.56	7,805

A breakdown of the existing average yearly demand by pressure zone (using the new recommended pressure zones) is shown in Table 3-11, along with the City water rights and JVWCD contract volume available in each zone. The JVWCD contract volume is not limited by zone. Amounts shown in the table are arbitrary and chosen so that each zone has some remaining supply volume allotted.

Table 3-11: Existing Average Yearly Demand Requirements by Pressure Zone

Zone	ERCs	Demand (acre-feet)	Water Supply Capacity in Zone (acre-feet)			
			Available			Remaining
			City Water Rights	JVWCD[1]	Total	
Midvale	11,970	6,700	4,952	1,875	6,297	127
North Union	630	355	0	1,210	1,210	105
South Union	1,340	750				
Total	**13,940**	**7,805**	**4,952**	**3,085**	**8,037**	**232**

[1] The proportion of the JVWCD contract amount allotted to each zone is arbitrary. The contract does not limit volumes by pressure zone.

Midvale City's water rights are not sufficient to meet the existing average yearly demand. The City requires water from JVWCD to meet these demands. When including the 3,085 acre-feet contract volume available from JVWCD, the current yearly supply available is sufficient to meet the required existing average yearly demand plus 232 acre-feet for future development. As discussed previously in this chapter, the volume used by Midvale City (produced from wells and received at JVWCD connections) is less than the requirements shown herein. Also, the City should maximize use of the City wells before purchasing additional JVWCD water.

FUTURE WATER SOURCE REQUIREMENTS

Future water source requirements were evaluated based on the same criteria as existing water source requirements. To summarize, this includes the following:

1) Sufficient water source capacity is needed to meet peak day flow.
2) Water sources must also be capable of supplying the average yearly demand.
3) Sufficient sources should be available to supply the system even if a well is out of service.
4) Peak day and average yearly demand are calculated using the level of service criteria shown in Table 1-1 of this report by computing the demand from actual water use data with a factor of safety for variance (Subsection R309-510-7(2)).
5) The level of service selected is based on the DDW standard, requiring minimum source and storage sizing to be based on system-specific analysis of three years of usage data. Future DDW standards may vary slightly from year to year.

As discussed in Chapter 2 of this report, this master plan covers the planning period through 2060, when the City is projected to reach 23,580 ERCs. A significant portion of this growth will occur west of I-15, primarily in the Jordan Bluffs area.

Future Peak Day Demand

Following the methodology described for existing conditions and estimating 23,580 ERCs in 2060, the peak day source requirement is projected to be 19,571 gpm (28.2 MGD). See Table 3-12.

Table 3-12: 2060 Peak Day Demand

ERCs	Peak Day Demand (gpm/ERC)	Total Peak Day Demand (gpm)
23,580	0.83	19,571

A breakdown of the 2060 peak day demand by pressure zone (using the new recommended pressure zones) is shown in Table 3-13. The table also shows the capacity available and remaining in each zone.

Table 3-13: 2060 Source Requirements by Pressure Zone

Zone	ERCs	Demand (gpm)	Source Capacity in Zone (gpm)	
			Available	Remaining
Midvale	20,260	16,815	11,800	-5,015
North Union	1,355	1,125	2,500	-255
South Union	1,965	1,630		
Total	**23,580**	**19,570**	**14,300**	**-5,270**

Under 2060 conditions, there is a projected source capacity deficiency of 5,270 gpm based on the capacity of the existing sources, including the current JVWCD connections. This deficiency does not consider the ability to provide redundancy if one of the City's wells or a JVWCD connection is out of service.

It is recommended that Midvale pursue obtaining an additional JVWCD connection at Winchester Street and 700 West. This connection should be capable of providing 4,000 gpm. Approximately 3,000 gpm will be used under typical peak day conditions, and the remaining 1,000 gpm will be used to provide some redundancy. The capacity of the other existing JVWCD connections will need to be increased to meet future peak day requirements. Table 3-14 shows the required source capacities for Midvale wells and JVWCD connections for 2060 peak day conditions. A new vault will be required for the 175 West 7500 South JVWCD connection.

Table 3-14: 2060 Drinking Water Sources

Source	Zone	Maximum Flow (gpm)
Well Sources		
Hancock Well	Midvale	1,950
Million Gallon Well	Midvale	2,150
Oak Street Well	Midvale	1,200
Park Street Well	Midvale	n/a
Phillips Well	North Union	n/a
Prowswood Well	Midvale	n/a
Total Well Sources		**5,300**
JVWCD Sources		
Winchester St. 700 West	Midvale	4,000
175 W 7500 S	Midvale	4,000
1200 E 9400 S	Midvale	1,000
7610 S 700 E	Midvale	6,500
1000 E 7800 S[1]	South Union	4,500
Total JVWCD Sources		**20,000**
Total		**25,300**
Demand		**19,570**
Remaining		**5,730**

Note: The flow required at the 1000 East 7800 South JVWCD connection may be provided through multiple connections.

The North Union and South Union area of Midvale will continue to be supplied by JVWCD. The new pressure zones recommended in this plan minimize the area of the City that will be

supplied by JVWCD. Storage is discussed in Chapter 4 of this plan. If JVWCD supplies the only storage for this area, it will be located hydraulically distant from the City and the JVWCD connection(s) for this area must be capable of providing peak instantaneous flow for the North Union and South Union pressure zones. The majority of this flow will likely be provided at the 1000 East 7800 South JVWCD connection, but it is possible that JVWCD may be able to provide a connection near Union Park Avenue/Fort Union Boulevard to reduce reliance on the 1000 East 7800 South connection and to reduce the amount of transmission required north of the connection. In Table 3-14, all flow is assumed to be provided at the 1000 East 7800 South connection.

As shown in Table 3-14, with the recommended sources in place there is 5,730 gpm source available for redundancy and future demands. It is recommended that the City consider redeveloping Oak Street well and possibly Park Street well to provide full beneficial use of the City's water rights and to provide additional redundancy in the future.

Future Average Yearly Demand

Following the methodology described for existing conditions and estimating 23,580 ERCs in 2060, the average yearly source requirement is projected to be 13,205 ac-ft. See Table 3-15.

Table 3-15: 2060 Average Yearly Demand

ERCs	Average Yearly Demand (ac-ft/ ERC)	Total Average Yearly Demand (ac-ft)
23,580	0.56	13,205

A breakdown of the existing average yearly demand by pressure zone (using the new recommended pressure zones) is shown in Table 3-16.

Table 3-16: 2060 Average Yearly Demand Requirements by Pressure Zone

Zone	ERCs	Demand (acre-feet)	Water Supply Capacity in Zone (acre-feet)			
			Available			Remaining
			City Water Rights	JVWCD[1]	Total	
Midvale	11,970	11,345	4,952	1,875	6,827	-4,518
North Union	630	760	0	1,210	1,215	-650
South Union	1,340	1,100				
Total	**23,580**	**13,205**	**4,952**	**3,085**	**8,037**	**-5,168**

[1]The proportion of the JVWCD contract amount allotted to each zone is arbitrary. The contract does not limit volumes by pressure zone.

Midvale City's water rights and the current JVWCD contract amount are not sufficient to meet future average yearly demand. The City will require approximately 5,170 acre-feet in annual supply from JVWCD to meet these demands.

FUTURE WATER SOURCES AND RECOMMENDATIONS

The City should maximize use of the existing City wells to maximize use of the City's water rights and reduce the volume required to be purchased from JVWCD in the future. If the pressure zones are reconfigured as recommended in this master plan, this will increase the proportion of the system demand that can be provided by the City wells.

As source demand increases over time, the existing City wells and JVWCD connections will not provide sufficient redundancy if the largest well or JVWCD connection is ever out of service. Additionally, older wells can reduce production or stop producing over time due to a variety of reasons including biofouling and chemical encrusting. It is recommended that development of additional wells near the existing City wells should continue to be pursued to provide redundancy and to replace wells as they age.

Future planned drinking water sources include a connection from JVWCD at 700 West Winchester Street and increased capacity at the existing connections at 175 West 7500 South, 7610 South 700 East, and 1000 East 7800 South. Vaults at 700 West Winchester and 175 West 7500 South are currently in design and the desired future connections will be accommodated to the extent possible in the vault designs. The new 700 West Winchester Street connection will require constructing a 20-inch transmission line to 6980 South. The cost for upgrading the 175 West vault is approximately **$200,000**. The cost for constructing a vault for Midvale outside the JVWCD 700 West vault is approximately **$200,000** and the cost for the transmission line to 6980 South is approximately **$657,000**. These costs are detailed in Chapter 6, Capital Facility Plan.

It is recommended that the City continue to maintain emergency connections with Sandy City to provide redundancy (discussed in Chapter 5, Water Distribution.)

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CHAPTER 4 WATER STORAGE

EXISTING WATER STORAGE

The City's existing drinking water system includes two concrete storage facilities with a total capacity of **6.6 MG**. Tank locations are shown on Figure 1-1. Table 4-1 presents a listing of the names and select attributes of the City water storage tanks. Both tanks supply water to the Midvale pressure zone. Storage for the North Union and South Union pressure zones is currently provided by JVWCD, with a contracted volume of **4.8 MG** provided by JVWCD.

Table 4-1: Existing Storage Tanks

Tank Name	Diam. (ft)	Calculated Volume (MG)	Base/ Outlet Elevation	Emergency Storage Volume (gallons)	Fire Suppression Volume (gallons)	Minimum Level (Elevation) of Equalization Volume	Overflow Level (Elevation)
4 MG (East)	188	4.03	4572.1	611,000	770,000	6.65 (4578.75)	19.4 (4591.5)
2.5 MG (West)	150	2.56	4572.1	389,000	490,000	6.65 (4578.75)	19.4 (4591.5)
Total		**6.6**		**1,000,000**	**1,260,000**		

EXISTING WATER STORAGE REQUIREMENTS

According to DDW standards outlined in Section R309-510-8, storage tanks must be able to provide: 1) equalization storage volume to make up the difference between source and demand; 2) fire suppression storage to supply water for firefighting; and 3) emergency storage, if deemed necessary. Each of the requirements is addressed below.

Equalization Storage

As shown in Table 1-1, Midvale has planned for a level of service of 500 gallons per ERC of equalization storage. With 13,940 existing ERCs, the City needs 7.0 MG of equalization storage in its existing drinking water system. Table 4-2 lists the equalization storage requirement by pressure zone.

Table 4-2: Existing Drinking Water Equalization Requirements

Zone	ERCs	Equalization (MG)
Midvale	11,970	6.0
North Union	630	0.3
South Union	1,340	0.7
Total	**13,940**	**7.0**

Fire Suppression Storage

Fire suppression storage is required for water systems that provide water for firefighting (Subsection R309-510-8(3)). HAL has consulted with the local fire authority to determine the requirements for fire suppression storage. The contact information for the Midvale fire code official is as follows:

Fire Code Official: Christen Yee, Area Inspector, Unified Fire Authority
Phone: 801-743-7228, 801-750-9476
Email: cyee@unifiedfire.org

The minimum fire flow requirement is 1,000 gpm for 2 hours. Larger structures require larger fire flows, with all fire flow requirements based on the International Fire Code (IFC) and fire code official recommendations. The largest fire flow requirements for each zone were determined as shown in Table 4-3.

Table 4-3: Existing Fire Suppression Requirements

Zone	Building and Location	Fire Flow Requirement		Fire Suppression Volume (MG)
		Flow (gpm)	Duration (hours)	
Midvale	East Midvale Elem. School 6990 South 300 East	5,250	4	1.3
North Union & South Union[1]	Commercial District 900 East-1300 East	4,000	4	1.0
Total				**2.3**

[1]Storage for the North Union and South Union zones will be provided at a single location.

The water system should be managed so that the storage volume dedicated to fire suppression is available to meet fire flow requirements whenever or wherever needed. This can be accomplished by designating minimum storage tank water levels that provide a reserve storage equal to the fire suppression storage required. Even though it is important to utilize equalization storage, typical daily water fluctuations in the tanks should not be allowed below the minimum established levels, except during fire or emergency situations. The minimum levels for fire and emergency storage are shown in Table 4-1.

Emergency Storage

DDW standards suggest that emergency storage be considered in the sizing of storage facilities. Emergency storage is intended to provide a safety factor that can be used in the case of unexpectedly high demands, pipeline failures, equipment failures, electrical power outages, water supply contamination, or natural disasters. The City selected 1.5 MG of emergency storage level of service. 1.0 MG is assumed for the Midvale pressure zone and 0.5 MG is assumed for the North Union and South Union pressure zones.

Total Storage

A summary of existing storage requirements is included in Table 4-4.

Table 4-4: Existing Storage Requirements

Zone	ERCs	Recommended Storage Requirements (MG)				Existing Storage	Remaining
		Equalization	Fire Suppression	Emergency	Total		
Midvale	11,970	6.0	1.3	1.0	8.3	8.6[1]	0.3
North & South Union	1,970	1.0	1.0	0.5	2.5	2.8[1]	0.3
Total	**13,940**	**7.0**	**2.3**	**1.5**	**10.8**	**11.4**[1]	**0.6**

[1] 4.8 MG of storage is currently provided by JVWCD and can be used in either pressure zone.

JVWCD is currently providing 4.8 MG storage for the existing Union Area pressure zone, which is significantly larger than the recommended North Union and South Union pressure zones. Table 4-5 shows the calculated storage volume required based on the number of ERCs in the existing Union area pressure zone and the requirements detailed in this report.

Table 4-5: Storage Requirements for Union Zone Currently Provided by JVWCD

Zone	ERCs	Recommended Storage Requirements (MG)			
		Equalization	Fire Suppression	Emergency	Total
Union Area	5,491	2.7	1.0	0.5	4.2

Based on the requirements shown, and the volume of storage being provided by JVWCD, the existing storage meets existing requirements. In the future, Midvale will be required to provide their own storage for the entire City or negotiate with JVWCD to continue to provide storage for a portion of the City. Table 4-5 can be used to understand Midvale's current storage requirements if they were required to provide their own storage now, without revising the City pressure zones as recommended in this report.

Midvale City's preferred solution is for the City to construct storage for the recommended Midvale pressure zone and pay JVWCD to construct the volume needed for the recommended North Union and South Union pressure zones. The storage for the North Union and South Union zones is anticipated to be constructed at a JVWCD location (wherever JVWCD determines

storage is needed), and Midvale's 1000 East 7800 South connection will provide peak instantaneous flows for the North Union and South Union pressure zones. By revising the pressure zones, Midvale is minimizing the volume of storage required to be provided by JVWCD.

FUTURE WATER STORAGE REQUIREMENTS

Storage requirements through the 2060 planning period were assessed using the same methodology as outlined for existing conditions.

Equalization Storage

Following the methodology described for existing conditions and calculating 23,580 ERCs in 2060, the projected equalization storage requirement per the standards shown in Table 1-1 is 11.8 MG. Table 4-6 lists the equalization storage requirement by pressure zone.

Table 4-6: 2060 Drinking Water Equalization Requirements

Zone	ERCs	Equalization (MG)
Midvale	20,260	10.1
North Union	1,355	0.7
South Union	1,965	1.0
Total	**23,580**	**11.8**

Fire Suppression Storage

Fire suppression storage is assumed to remain similar to current conditions, as shown in Table 4-3. There are no plans to reconstruct East Midvale Elementary, but if it is replaced by new construction, the fire flow volume in the Midvale zone could be reduced.

Some buildings may require approved sprinkling systems to reduce their fire flow requirement to the flow rates available. All new buildings should be constructed to meet these requirements.

Emergency Storage

The same emergency volume of 1.0 MG for the Midvale pressure zone and 0.5 MG for the North Union and South Union pressure zones was maintained for future conditions.

Total Storage

A summary of storage requirements for 2060 is included in Table 4-7.

Table 4-7: 2060 Storage Requirements

Zone	ERCs	Recommended Storage Requirements (MG)				Existing Storage	Remaining
		Equalization	Fire Suppression	Emergency	Total		
Midvale	20,260	10.1	1.3	1.0	12.4	6.6	-5.8
North & South Union	3,320	1.7	1.0	0.5	3.2	0	-3.2
Total	**23,580**	**11.8**	**2.3**	**1.5**	**15.6**	**6.6**	**-9.0**

Approximately 9 MG additional storage (beyond existing) is required to meet 2060 requirements.

Table 4-8 shows the volume of storage that will be needed based on the number of ERCs in the City. Estimated years are included, but these will vary based on growth rate.

Table 4-8: Storage Requirements by ERCs

ERCs	Estimated Year[1]	Required Storage[2] (MG)	Existing Storage (MG)		Additional Storage Needed (MG)	Location of New Storage	
			Midvale	JVWCD[3]		JVWCD System[3]	Midvale
13,940	2020	10.8	6.6	4.8	0.0	0.0	0.0
15,400	2024	11.4	6.6	4.8	0.0	0.0	0.0
17,100	2028	12.3	6.6	4.8	0.9	3.2	0.0
17,600	2029	12.5	6.6	0	5.9	3.2	2.8
18,900	2035	13.2	6.6	0	6.6	3.2	3.5
19,900	2040	13.7	6.6	0	7.1	3.2	4.0
20,800	2045	14.1	6.6	0	7.5	3.2	4.4
21,700	2050	14.6	6.6	0	8.0	3.2	4.9
22,600	2055	15.0	6.6	0	8.4	3.2	5.3
23,600	2060	15.6	6.6	0	9.0	3.2	5.8

[1]Years are estimated based on projected growth rates. ERCs control the volume of storage needed.
[2]Required storage includes 2.3 MG for fire suppression, 1.5 MG for emergency, and 500 gallons per ERC for equalization.
[3]The current storage contract with JVWCD ends in 2029, so JVWCD storage is shown as dropping to 0 in that year. Midvale plans to pursue building 3.2 MG in the JVWCD system.

As shown in the table, additional storage will be required by the time the City adds approximately 1,460 ERCs. Based on projected growth rates, this may happen as soon as 2024. If 3.2 MG is constructed in the JVWCD system for the North Union and South Union pressure zones, an additional 2.8 MG would be needed for the Midvale zone by the time the City reaches 17,600 ERCs (~2029). Volumes needed beyond this are shown in Table 4-8. It is recommended that a 4.0 MG storage tank be constructed by 2029 to meet requirements for the

next 20 years. A modular tank design could be used to allow the tank to be expanded in the future. The following section explores storage alternatives.

FUTURE WATER STORAGE ALTERNATIVES

Midvale has the ultimate responsibility to provide storage for the entire City. Midvale will attempt to reach an agreement with JVWCD to supply storage for the North Union and South Union pressure zones. Midvale City would pay for the storage to be constructed and pay ongoing operations and maintenances fees to JVWCD. The storage tank would be located on a JVWCD site and the tank would operate as part of JVWCD's wholesale distribution system. JVWCD would operate the tank and supply peak instantaneous flows to areas of the City supplied by the tank. If Midvale is unable to reach an agreement with JVWCD, the City would need to supply the full storage requirement. The following paragraphs discuss storage alternatives for each pressure zone in the City.

Several location alternatives for the Midvale zone were evaluated. Storage for this zone should be located at the same elevation as the existing storage, with the base at elevation 4572. The blue contour (4590) on Figure 4-1 Storage Alternatives (located at the end of this chapter) shows the approximate desired elevation for a buried storage tank.

Near Existing Tank Site – Quarry Bend Drive/Harvard Park Drive

Storage could be added near the location of the existing tanks. Midvale may be able to purchase a piece of the Pebblebrook Golf Course. A piece of property behind a church just north of the golf course would be at the correct elevation for a partially-exposed tank. The property includes a pavilion and softball backstops and is likely unavailable for purchase. The City could also purchase home lots at the correct elevation. A transmission line could be constructed on Harvard Park Drive and 1000 East and could utilize the existing Midvale 24-inch transmission line on 7800 South.

Encompass Health Rehabilitation Hospital of Utah – 8074 South 1300 East

Approximately 2.2 acres west of the hospital is used for landscaping and could be used to construct a buried tank. The available shape is long and somewhat narrow, but could accommodate a rectangular tank. Transmission would likely be provided in 1300 East and would utilize the existing 24-inch City transmission line in 7800 South.

Commercial Parking Lots – 7800-8000 South 1300 East

The commercial parking lots in the Macey's/Vasa Fitness complex are at the correct elevation for a buried tank. It would be extremely difficult to use these areas for construction during the time period required for tank construction. Transmission would likely be provided in 1300 East and would utilize the existing 24-inch City transmission line in 7800 South.

Storage for North Union and South Union Zones

Storage for the North Union and South Union zones should be located with the base at approximately elevation 4705. The red contour (4725) shows the desired elevation for a buried storage tank. Specific locations were not evaluated. If JVWCD can provide storage for these zones, it would be located at 2800 East 9400 South or at 2300 East 9800 South. These locations are shown on Figure 4-1. The 2800 East 9400 South location is occupied by aging steel tanks that will need to be replaced. Larger tanks could be constructed at this location. There is space available at the 2300 East 9800 South location and this location is also in need of storage for the JVWCD system to function optimally. Both JVWCD sites are several miles from Midvale City boundaries and transmission from the tank sites to Midvale would be through the existing or future JVWCD system.

A tank constructed by Midvale City for the North Union and South Union pressure zones could also serve the Midvale zone through PRVs, but would not be the most energy efficient solution. A tank to serve the entirety of these zones would need to be located at an approximate elevation of 4725. The red contour on Figure 4-1 shows the approximate desired elevation for a buried storage tank to serve these zones. Specific locations have not been evaluated. As shown on Figure 4-1, the 4725 contour is located some distance away from the City and a transmission pipeline between the service area and the tank would likely be 2-2.5 miles long. The line would be required to be large (approximately 36") to avoid significant pressure losses.

EXISTING AND FUTURE WATER STORAGE RECOMMENDATIONS

The City currently requires 10.8 MG drinking water storage. The City will need a total of 15.6 MG of drinking water storage in 2060. The City currently owns a total of 6.6 MG storage. An additional 9 MG of storage is needed to meet 2060 requirements. Potential locations for future drinking water storage tanks are shown on Figure 4-1.

It is recommended that the City pursue obtaining property to construct a tank capable of serving the Midvale pressure zone. The City should begin feasibility studies and design of a 4 MG tank. This will supply storage needs until the City reaches 19,900 ERCs (~2040). A modular tank design could be used to allow the tank to be expanded in the future. A possible location for this storage and associated transmission is shown on Figure 5-2, Recommended Capital Facility Projects. It is also recommended that the City continue discussions with JVWCD concerning participation in an agreement for JVWCD to supply storage to the North Union and South Union pressure zones.

The cost for adding new storage facilities varies based on the costs of land, labor, and construction materials. However, $1.15 per gallon of storage has been found to be a reasonable, conservative estimate. In addition, it is recommended that 20% of the estimated cost should be added for contingency and 15% for engineering. Therefore, the total cost that should be planned for providing adequate storage by 2060 is approximately **$14,300,000**. The cost of transmission lines is in addition to tank costs and will likely total at least **$2,800,000**. Costs for storage and associated transmission are included in Chapter 6, Capital Facility Plan.

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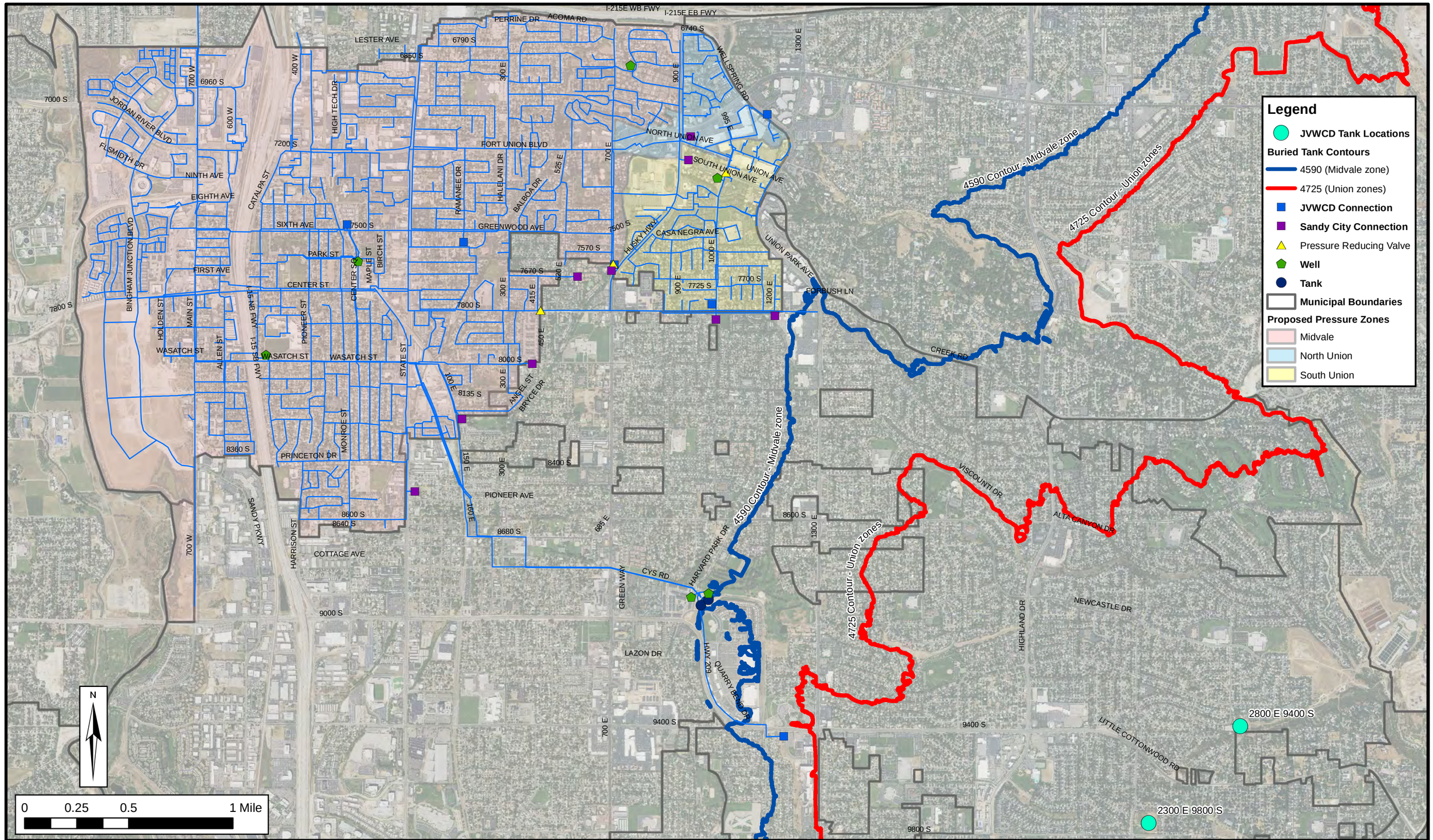

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HANSEN ALLEN & LUCE INC ENGINEERS

MIDVALE CITY DRINKING WATER SYSTEM

STORAGE ALTERNATIVES

FIGURE 4-1

CHAPTER 5 WATER DISTRIBUTION

HYDRAULIC MODEL

Development

A computer model of the City's drinking water distribution system was developed to analyze the performance of the existing and future distribution system and to prepare solutions for existing facilities not meeting distribution system requirements. The model was developed with the software InfoWater 12.4 (Innovyze, 2018). InfoWater simulates the hydraulic behavior of pipe networks. Sources, pipes, tanks, valves, controls, and other data used to develop the model were obtained from GIS data of the city's drinking water system and other updated information supplied by the City. The model has been transferred to EPANET to allow the City to use it as desired.

HAL developed models for two phases of drinking water system development. The first phase was a model representing the existing system (existing model). This model was used to calibrate the model and identify deficiencies in the existing system. Calibration was performed by comparing model results to system performance gathered by City personnel. Calibration data is included in Appendix C.

The second phase was a model representing future conditions and improvements necessary to accommodate growth. The future model represents the level of growth projected to be reached by 2060 (2060 model), and includes 23,580 ERCs.

Model Components

The two basic elements of the model are pipes and nodes. A pipe is described by its inside diameter, length, minor friction loss factors, and a roughness value associated with friction head losses. A pipe can contain elbows, bends, valves, pumps, and other operational elements. Nodes are the endpoints of a pipe and can be categorized as junction nodes or boundary nodes. A junction node is a point where two or more pipes meet, where a change in pipe diameter occurs, or where flow is added (source) or removed (demand). A boundary node is a point where the hydraulic grade is known (a reservoir, tank, or PRV). Other components include tanks, reservoirs, pumps, valves, and controls.

The model is not an exact replica of the water system, although efforts were made to make the model as complete and accurate as possible. Pipeline locations used in the model are approximate and not every pipeline may be included in the model. Moreover, it is not necessary to include all distribution system pipes in the model to accurately simulate its performance. The model includes all known distribution system pipes of all sizes, sources, storage facilities, pump stations, pressure reducing valves, control valves, controls, and settings.

Pipe Network

The pipe network layout originated from GIS data provided by the City. Projects completed in recent years were added/updated in the model. Elevation information was obtained from the GIS data provided by the City. Smaller 8-inch and 10-inch pipes are generally PVC. The Darcy-Weisbach method was used, and roughness coefficients for pipes in this model ranged from 0.4-1.01, which is typical for these pipe materials in modeling software (Rossman 2000, 31).

The existing water system contains approximately 120 miles of pipe with diameters of 2 inches to 24 inches. Figure 5-1 presents a summary of pipe length by diameter.

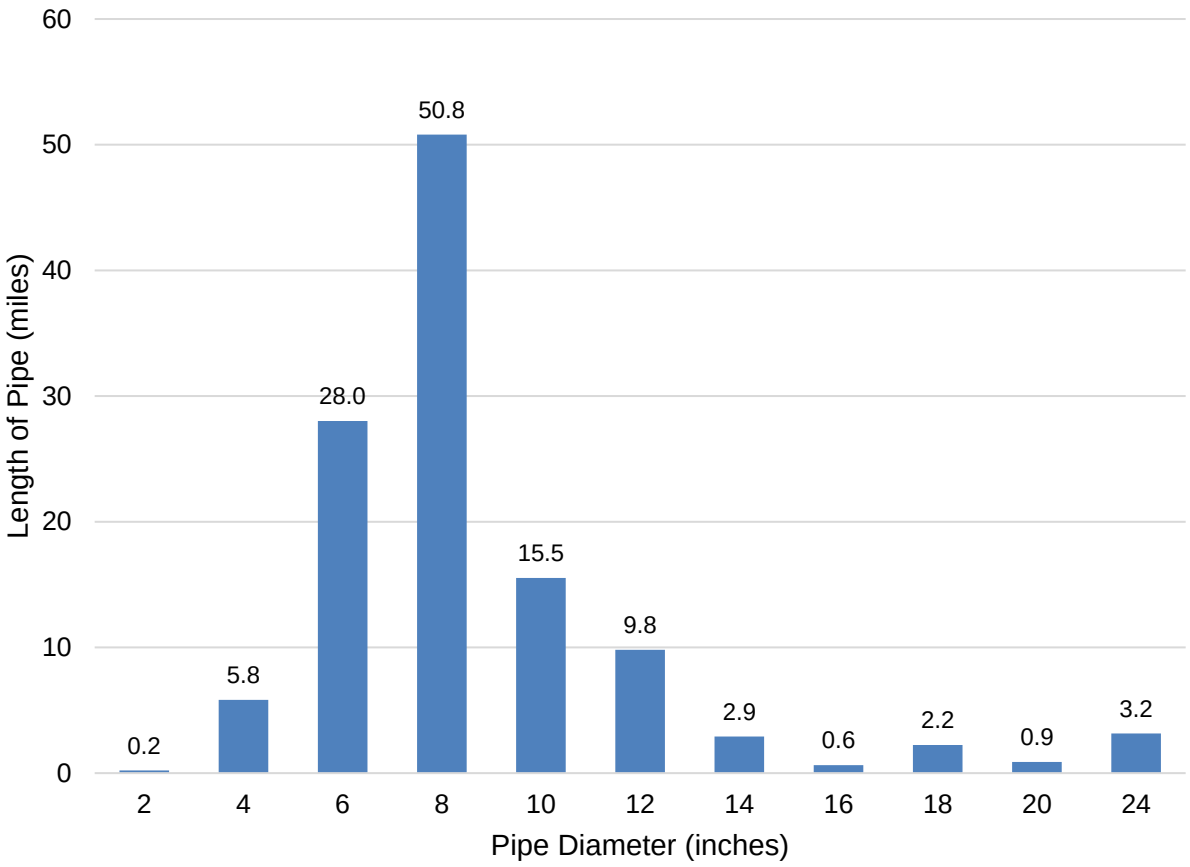

Figure 5-1: Summary of Pipe Length by Diameter

Water Demands

Water demands were allocated in the model based on billed usage and billing locations. Peak month demand was determined for each billing location and linked to the geocoded physical locations for each customer. The geocoded demands were then assigned to the closest model node. With the proper spatial distribution, demands were scaled to reach the peak day demand determined in Chapter 3. For the 2060 model, future demands were estimated as described previously in this report. Future demands were assigned to new nodes representing the expected location of new development in each pressure zone.

The pattern of water demand over a 24-hour period is called the diurnal curve, or daily demand curve. The diurnal curve for this master plan was taken from past SCADA data from the City. The diurnal curve for this study has a peaking factor of 1.7. The diurnal curve was input into the model to simulate changes in the water system throughout the day.

In summary, the spatial distribution of demands followed geocoded water use data, the flow and volume of demands followed the level of service standards described in Chapter 1, and the temporal pattern of demand followed a diurnal curve developed from SCADA data.

Water Sources and Storage Tanks

The sources of water in the model are the wells and JVWCD connections. A well is represented by a reservoir and pump. A JVWCD connection is represented by a reservoir and a flow control valve. Tank location, height, diameter, and volume are represented in the model. The extended-period model predicts water levels in the tanks as they fill from sources and as they empty to meet demand in the system.

RECOMMENDED PRESSURE ZONES

HAL recommends that Midvale expand the existing West Midvale pressure zone to encompass the majority of the city. The remainder of the City east of 700 East/900 East will be divided into two additional small pressure zones. Figure 2-1 shows the recommended new pressure zones. Several projects are required to combine these zones.

- Increase connectivity within the new Midvale pressure zone by constructing or upsizing connecting pipes at the following locations:
    - State Street/7200 South
    - State Street/Inglenook Drive
    - 7800 South, Sandra Way to 200 East
    - 8000 South, 100 East to 150 East
    - Greenwood Avenue, 270 East to Regent Park Lane
- Add PRV/check valve vaults to provide interconnections and redundancy between zones:
    - 900 East Fairmeadows Drive
    - 700 East 7200 South
- Close pipes that cross the proposed pressure zone boundaries to isolate the North Union and South Union zone from the Midvale zone.
- Increase flow at JVWCD 700 East connection and adjust pressure settings.

Midvale City is still paying for storage within the JVWCD system. Flow at the JVWCD 700 East connection will be allowed to peak until Midvale City constructs new storage. Pressure at this connection will need to be set to maximize pressure for residents at the top of the new pressure zone (just west of 900 East) and prevent the existing City tanks from overtopping. Until additional storage is constructed, flow from the 700 East JVWCD connection should not be encouraged to flow westerly, in order to allow the existing City tanks to function properly. This means that several of the zone connections may not be required until development increases in the future. Finalizing the exact settings is beyond the scope of this master plan and additional analysis will be required before creating the new pressure zones. Capital projects required to modify the zone boundaries are shown in Table 5-1.

All costs shown in this master plan are based on the 2019 RS Means Heavy Construction Cost Data, as shown in the unit costs table in Appendix D. All costs shown in all following tables include 20% for contingency and 15% for design. Costs are discussed in more detail in Chapter 6, Capital Facility Plan.

Table 5-1: Projects to Modify Zone Boundaries

	Location	Pipe Diameter (inches)	Length of Pipe (feet)	Cost
1	State Street/7200 South	12	100	$50,000
2	State Street/Inglenook Drive	12	100	$50,000
3	7800 South, Sandra Way to 200 East	12	300	$105,000
4	8000 South, 100 East to 150 East	12	250	$88,000
5	Greenwood Ave, 270 East to Regent Park Lane	12	330	$66,000
6	900 East Fairmeadows Drive PRV/Check Valve			$50,000
7	700 East 7200 South PRV/Check Valve			$50,000
Total Cost for Projects to Modify Zone Boundaries				**$459,000**

SYSTEM ANALYSIS METHODOLOGY

HAL used extended-period and steady-state modeling to analyze the performance of the water system with current and projected future demands. An extended-period model represents system behavior over a period of time: tanks filling and draining, pumps turning on or off, pressures fluctuating, and flows shifting in response to demands. A steady-state model represents a snapshot of system performance. The peak day extended period model was used to set system conditions for the steady-state model, calibrate zone to zone water transfers, analyze system controls and the performance of the system over time, and to analyze system recommendations for performance over time. The steady-state model was used for analyzing the peak day plus fire flow conditions.

Two operating conditions were analyzed with the extended period model: peak day conditions and peak instantaneous conditions. Peak day plus fire flow conditions were analyzed using a steady-state model. Each of these conditions is a worst-case situation so the performance of the distribution system may be analyzed for compliance with DDW standards and City preferences.

Existing Peak Day Conditions

The DDW requires that a minimum pressure of 40 psi must be maintained during peak day demand (Subsection R309-105-9(2)). Midvale City desires that 50 psi should be maintained. Peak day demand was evaluated at the level of service shown in Table 1-1. This amounts to an existing peak day demand of 11,570 gpm. The hydraulic model indicates that the system is capable of providing at least 40 psi at nearly every point of connection in the system at this level of demand. The paragraphs below describe all locations not meeting Midvale's current designated level of service. All points of connection meet DDW requirements, and there are no existing deficiencies for this demand condition.

Pressure Swings

The westerly portion of the existing Union pressure zone located between State Street and 300 East, from I-215 to 7200 South experiences pressure swings of 20 psi during the peak day. This

is not considered a serious deficiency and no mitigation projects are recommended. Pressure swings in all other areas of the City are less than 20 psi on the peak day.

High Velocity
Several pipes experience high velocities during peak day conditions. These high velocities do not appear to be causing unacceptable pressure drops or pressure swings. As demands increase, these pipes will need to be upsized or parallel pipes added.

700 East, JVWCD Connection to Downing Lane – velocities in the 700 East pipes are as high as 7.6 feet per second at the peak instantaneous condition. Buildout requirements are discussed below.

Fort Union Boulevard, Pearl Circle to 525 East – this short length of pipe is a bottleneck and experiences velocities up to 5.6 fps. Buildout requirements are discussed below.

1000 East, JVWCD Connection to Casa Roja Street – velocities in the 1000 East pipe reach 6.1 fps. Buildout requirements are discussed below.

Greenwood Avenue, 270 East to Regent Park Lane – This short length of pipe experiences velocities as high as 8.7 fps. This pipe is located at the boundary of the existing pressure zones and would serve as a good location to connect the zones in the future.

Existing High Pressure Conditions

The area west of I-15 experiences high pressures, which are greatest during the lowest demand times. This area experiences pressures up to 135 psi during typical operating conditions. The City should require individual PRVs for each new customer connection, particularly in these areas. No pressure changes are recommended, because this would reduce pressures in the upper portions of those zones to levels below the minimum desired. No capital projects are recommended to mitigate high pressures.

Existing Peak Instantaneous Conditions

A minimum pressure of 30 psi must be maintained during peak instantaneous demand (Subsection R309-105-9(2)). The City desires 50 psi to be available. Peak instantaneous demand was defined based on SCADA data for the peak day demand in Midvale. The highest peaking factor present on the peak day was 1.7, resulting in a peak instantaneous demand of 19,795 gpm. The hydraulic model indicates that the system is capable of providing at least 30 psi at every point of connection in the system at this level of demand, and nearly all locations receive 50 psi. There are no existing deficiencies in the system for this demand condition.

Existing Peak Day plus Fire Flow Conditions

A minimum pressure of 20 psi must be maintained while delivering fire flow to a particular location within the system and supplying the peak day demand to the entire system (Subsection R309-105-9(2)). As specified by the Midvale Fire code official, a minimum fire flow of 1,000 gpm is required in all areas of the City. In 2010, an extensive review was made of all large buildings in the City to determine fire requirements. This review was updated as part of this master plan. Recent reconstruction of several schools has reduced fire flow requirements at those schools,

because the new construction uses more fire-resistant materials and includes approved sprinkling systems. Most new construction of large/commercial building includes approved sprinkling systems, allowing the fire flow requirements for these buildings to be minimized. Based on the results of the review, fire flows typically around 1,500-2,500 gpm are required for commercial and industrial areas. The largest required fire flows in the City reach 4,000-5,250 gpm. Required fire flows are shown throughout the City on the Available Fire Flow map (Figure E-1) in Appendix E.

Figure E-1 also shows fire flow available at nodes throughout the entire system. Future construction should be required to use building materials and sprinkling systems to reduce the required fire flows to the amount the system can provide. Identifying every pipe incapable of supplying the required fire flow is beyond the scope of this study. The computer analysis should not replace physical fire flow tests at fire hydrants as the primary method of determining fire flow capacity.

Several locations throughout the City experience fire flows below the desired level of service. The majority of these are cul-de-sacs or long, dead-end lines with 4-inch or 6-inch pipe sizes. Several of the locations are discussed below. Recommended projects to increase fire flow are shown in Table 5-2 and numbered on Figure 5-2, Recommended Capital Facility Projects, at the end of this chapter.

East Midvale Elementary
The largest fire flow required in the City is at East Midvale Elementary School (6990 South 300 East). There are no plans to reconstruct this school. The required fire flow is 5,250 gpm and only4,500 gpm is available. The fire department may be unable to use significantly more than 4,000 gpm during fire suppression efforts. Connecting Splendor View Circle (6815 South) to 6850 South would improve connectivity and raise the available fire flow at the school to 4,900 gpm. This project was recommended in the 2010 Master Plan and is shown in the table below. Reconfiguring the pressure zones as recommended will further improve connectivity and raise the available fire flow to at least 5,250 gpm.

300 East 8000 South
A building at 300 East 8000 South requires 4,250 gpm fire flow. 2,450 gpm is available from the Midvale City system. Additional flow is available from the Sandy City system at a fire hydrant immediately east of the building. No project to increase fire flow is recommended. When the pressure zones are reconfigured, a connection can be added on 8000 South from approximately 100 East to 150 East. This would increase flows significantly at this location. The 8000 South zone connection is included in Table 5-1.

Other Locations
Projects are not recommended to increase fire flows at the ends of very short cul-de-sacs if sufficient fire flow is available at the adjacent street. Emergency interconnections with Sandy City should be maintained where possible and would benefit both cities.

Table 5-2: Projects to Resolve Low Fire Flow

Location		Description	Solution	Length (feet)	Cost
8	Splendor View Circle (6815 South) to 6850 South	Lack of connectivity between two dead-end lines	Connect lines	210	$42,000
9	Depot Street, Holden Street to Main Street	4-inch line	Construct 8-inch	410	$66,000
10	Center Street, Main Street to LePage Street	Hydrants connected to 4-inch line	Connect two hydrants to 12" line in Center St.	-	$20,000
11	Cooper Street, south of Center Street	6-inch line	Construct 8-inch	450	$72,000
12	Alta View Drive, east of Chapel Street	4-inch line	Construct 8-inch	390	$63,000
13	Olympus Circle, north of Garden View Dr.	4-inch line	Construct 8-inch	630	$101,000
14	Cox Street, State Street to Rusty Drive	4-inch line	Construct 8-inch	820	$160,000
Cost for Fire Flow Projects			**$496,000**		

REPLACEMENT PROJECTS

Transite Pipes
City records indicate there are approximately 5,000 linear feet of asbestos-cement (transite) piping in the City system. This pipe material can contaminate water if it starts to break down and should be replaced. The locations of these pipes are shown in Figure 5-2 and the cost of replacing these lines is shown in Table 5-3.

Reroute Tank Transmission Line
The existing 24-inch transmission line from the tanks to the City travels under an industrial area, including the Altaview Concrete plant and RelaDyne facility tank farm. The pipe cannot be easily accessed for operations and maintenance and should be rerouted. A proposed alignment north of Resaca Street and on State Street is shown on Figure 5-2. This project is included in Table 5-3.

Table 5-3: Replacement Projects

	Location	Description	Pipe Diameter (inches)	Length (feet)	Cost
15	Southcrest Circle, west of 900 East	Transite	8	100	$16,000
16	900 East, Casa Negra to Lyndy Drive	Transite	8	100	$16,000
17	Casa Blanca Drive, 7575 South, and Casa Verde Street	Transite	8	1,000	$160,000
18	7575 South (not in street), Casa Negra Circle to 1000 East	Transite	8	1,350	$216,000
19	Mecham Lane (7575 South), east of 1000 East	Transite	8	350	$56,000
20	Wood Street, Marquette Dr. (north) to Princeton Drive	Transite	8	1,300	$208,000
21	North of Resaca Street and State Street, Resaca to 8000 South	Transmission realignment	30	2,000	$700,000
Total Cost for Replacement Projects					**$1,500,000**

Aging Pipes

The City should continue replacing aging pipes on a regular basis. Table 5-4 shows the cost of all existing pipes and the cost to replace them over a 50-year service life. Replacement of 4-inch pipes should be of high priority when road replacement projects are completed.

Table 5-4: Replacement Program for Existing Pipes

Pipe Diameter (inches)	Length of Pipe (feet)	Cost
2	1,100	$176,000
4	30,800	$4,928,000
6	147,900	$23,664,000
8	268,300	$42,928,000
10	82,000	$14,760,000
12	51,800	$10,360,000
14	15,400	$3,388,000
16	3,400	$816,000
18	11,900	$2,975,000
20	4,700	$1,269,000
24	16,600	$5,146,000
Total Cost for Replacement of All Existing Pipes		**$110,410,000**
Annual Cost for Replacement of All Pipes Over 50 Years		**$2,208,000**

FUTURE (2060) WATER DISTRIBUTION SYSTEM

2060 Peak Day and Peak Instantaneous Conditions

A minimum pressure of 40 psi must be maintained at all connections during peak day demand and 30 psi must be maintained during peak instantaneous demand (Subsection R309-105-9(2)). The City prefers that 50 psi be available under all conditions. All but a few locations maintain a minimum of 50 psi under peak instantaneous demand. Future peak day demand is discussed in Chapter 3 of this report. With 23,580 ERCs projected, the system's 2060 peak day demand is estimated at 19,571 gpm. A significant portion of the increased future demand will be required in the 260-acre Jordan Bluffs area. City planners expect to see additional development at other locations throughout the City, including within Bingham Junction, near the Fort Union Shopping Area, along State Street and 7200 South, and in transit-oriented development zones. Infill development is possible on small pockets of land throughout the City. The remaining projected growth will likely take place through redevelopment in future decades.

Peak instantaneous demands were calculated in a similar manner to existing conditions. The peak day to peak instantaneous peaking factor is 1.7 and the total peak instantaneous demand is 33,484 gpm.

The 2060 peak day and peak instantaneous conditions were evaluated using the recommended new pressure zones. The following projects are required to meet peak day and peak instantaneous requirements in 2060:

- Increase transmission capacity on 700 East
- Increase transmission capacity on 1000 East
- Increase transmission capacity on 7200 South (Fort Union Boulevard)
- Increase transmission capacity on North Union Boulevard
- Add separate service line on 7800 South if existing line is used for lower zone transmission
- Construct storage for Midvale pressure zone and transmission to City
- Increase flow rate and contract volume from JVWCD sources at 175 West, 700 East, 1000 East
- Add new JVWCD source at Winchester Street/700 West
- Add 20-inch transmission line from Winchester Street/700 West to 6980 South
- Connect existing pressure zones at the following locations (costs previously shown in Table 5-1):
    - State Street/7200 South
    - State Street/Inglenook Drive
    - 7800 South, Sandra Way to 200 East
    - 8000 South, 100 East to 150 East
    - Greenwood Avenue, 270 East to Regent Park Lane
- Add PRV/check valve vaults to provide interconnections and redundancy between zones (costs previously shown in Table 5-1):
    - 900 East Fairmeadows Drive
    - 700 East 7200 South

Details of improvements for source and storage have been discussed in previous sections of this report. Recommended transmission projects are shown in Table 5-5 and on Figure 5-2, Recommended Capital Facility Projects. Costs for source and storage are included in the Capital Facility Plan in Chapter 6.

Table 5-5: Transmission Projects for 2060 Conditions

	Location	Pipe Diameter (inches)	Length of Pipe (feet)	Cost
Increase existing transmission capacity				
22	700 East, JVWCD Connection (7600 South) to 7200 South	30	2,920	$906,000
23	700 East, 7200 South to Downing Street	16	850	$204,000
24	7200 South, 300 East to 700 East	20	2,650	$716,000
25	7200 South, Ramanee Drive to 300 East	16	1,100	$264,000
26	7200 South, State Street to Ramanee Drive	12	1,360	$272,000
27	1000 East, JVWCD Connection to Casa Roja Street	20	550	$149,000
28	1000 East, Casa Roja Street to Union Creek Way	16	1,800	$432,000
29	North Union Avenue	12	1,320	$264,000
Add parallel service line				
30	7800 South, Devin Place to 1200 East	8	3,000	$480,000
Add transmission for new source				
31	700 West, Winchester Street to 6980 South	20	2,430	$657,000
Add transmission for new storage tank				
32	Transmission from proposed tank to City[1]	30	8,000	$2,800,000
	Total Cost for 2060 Transmission Projects			**$7,144,000**

1 – Transmission costs for the proposed storage tank could be as much as $6,000,000 if the tank must be located several miles from the City.

2060 Peak Day plus Fire Flow Conditions

The same fire requirements used in the existing condition have been used in the 2060 condition. Fire flow requirements may decrease at some areas in the City (including Midvale Elementary and the building at 300 East 8000 South) as older buildings are removed and new buildings are constructed using more fire-resistant materials and approved fire sprinkling systems. Fire flow available does not significantly decrease in the 2060 condition and even increases in some areas as better connectivity is achieved. A site-specific analysis of available fire flow should be performed for each new development early in the development review process. All new construction should be required to use building materials and sprinkling systems to reduce the required fire flows to the amount the system is capable of providing. The PRV/check valves vaults previously recommended between the Midvale and Union pressure zones will provide redundancy and increase available fire flow in the 2060 condition.

CONTINUED USE OF THE MODEL

The model output primarily consists of the computed pressures at nodes and flow rates through pipes. The model also provides additional data related to pipeline flow velocity and head loss to help evaluate the performance of the various components of the distribution system. Results from the model are available on a CD in Appendix F. Due to the large number of pipes and nodes in the model, it is impractical to prepare a figure which illustrates pipe numbers and node numbers. The reader should refer to the CD to review model output.

The model should continue to be updated as the water system changes. The City can use the model as a tool for determining the effect of changes to the system and capacity of the system to provide fire flows for new developments. Fire flow tests should be completed on an ongoing basis to refine the model calibration as system conditions change.

WATER DISTRIBUTION SYSTEM RECOMMENDATIONS

In addition to all projects recommended in Tables 5-2 through 5-5, additional localized transmission pipelines are expected to be installed as the City develops. The locations and lengths of these transmission pipelines will vary depending on the final location of future streets and the majority will be minimum sized pipes constructed by developers. The City will continue to review individual developments through the Development Review Committee (DRC) process. This should include analyzing transmission line size requirements, particularly for developments in areas where the water system is developing or not well connected, such as in the Jordan Bluffs area, or in the future annexation south of Jordan Bluffs. Pipe sizes in these developments may need to be increased for initial service, even if the ultimate size requirement is smaller when developments are well connected.

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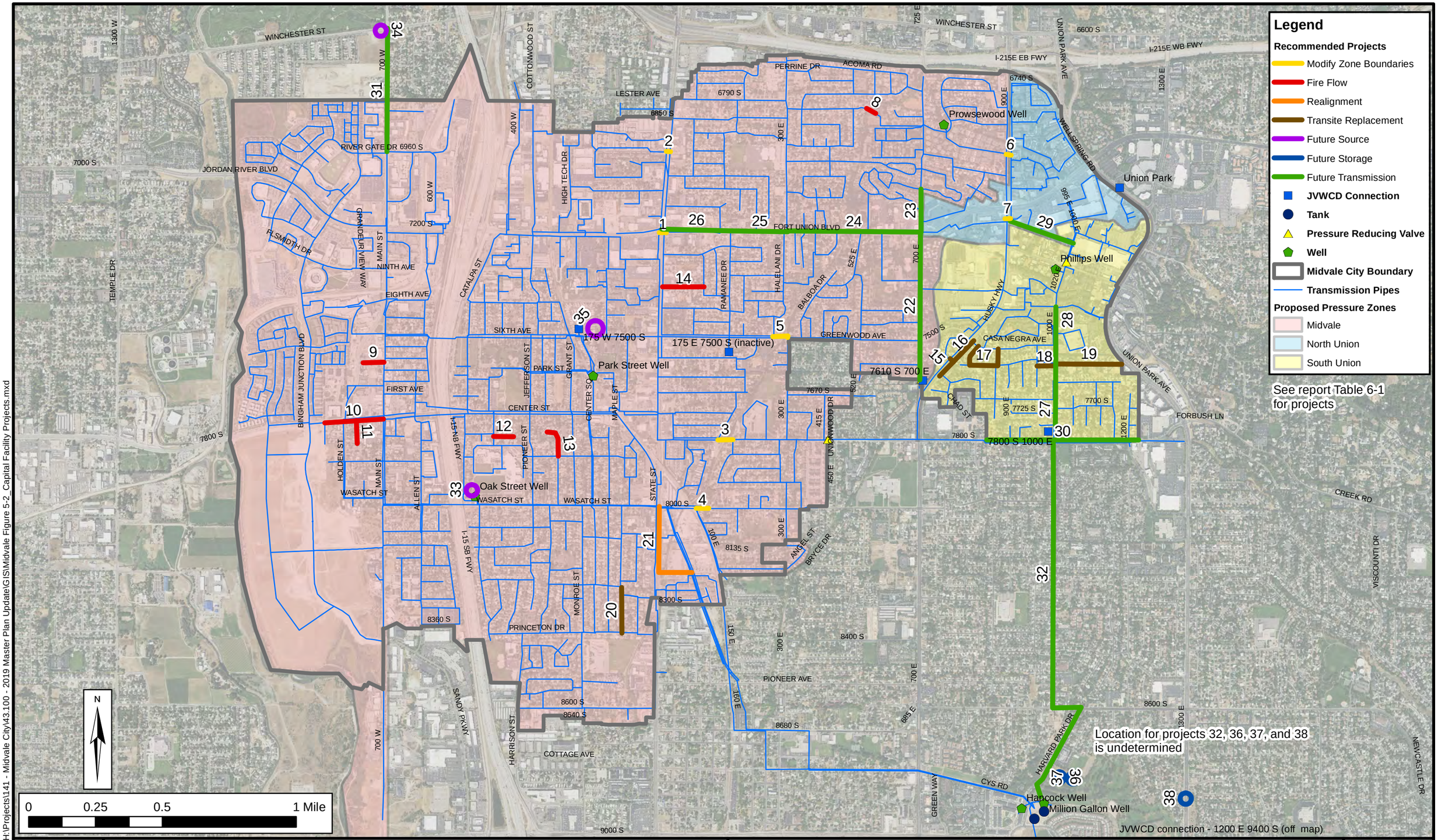

Date: 8/28/2020
Document Path: H:\Projects\141 - Midvale City\43.100 - 2019 Master Plan Update\GIS\Midvale Figure 5-2_Capital Facility Projects.mxd

HANSEN ALLEN & LUCE INC ENGINEERS	**MIDVALE CITY DRINKING WATER SYSTEM**	**RECOMMENDED CAPITAL FACILITY PROJECTS**

FIGURE 5-2

CHAPTER 6 CAPITAL FACILITY PLAN

GENERAL

Throughout the master planning process, the three main components of the City's water system (source, storage, and distribution) were analyzed to determine the system's ability to meet existing demands and anticipated future demands. System deficiencies identified in the master planning process and described previously in this report were presented to City staff. Possible solutions were discussed for system deficiencies, maintenance and other system needs not identified in the system analysis.

The purpose of this section is to summarize all drinking water facilities required for the 40-year planning period to meet the demands placed on the system by future development. Projects required to meet existing level of service criteria are also included in this section, including desired fire flow, replacement of transite pipes, existing pipe realignment, and replacement of aging pipes.

Cost estimates have been prepared for the recommended projects and are included in Table 6-1. Unit costs for the construction cost estimates are based on conceptual level engineering and are shown in the unit costs table in Appendix D. Sources used to estimate construction costs include:

1. "Means Heavy Construction Cost Data, 2019"
2. Price quotes from equipment suppliers
3. Recent construction bids for similar work

All costs are presented in 2020 dollars. Costs shown below include 20% for contingency and 15% for design. Recent price and economic trends indicate that future costs are difficult to predict with certainty. Engineering cost estimates provided in this study should be regarded as conceptual level for use as a planning guide.

PRECISION OF COST ESTIMATES

When considering cost estimates, there are several levels or degrees of precision, depending on the purpose of the estimate and the percentage of detailed design completed. The following levels of precision are typical:

Type of Estimate	Precision
Master Planning	±50%
Preliminary Design	±30%
Final Design or Bid	±10%

For example, at the master planning level, if a project is estimated to cost $1,000,000, then the precision or reliability of the cost estimate would typically be expected to range between approximately $500,000 and $1,500,000. While this may seem imprecise, the purpose of master planning is to develop general sizing, location, cost, and scheduling information on a number of individual projects that may be designed and constructed over a period of many years. Master planning also typically includes the selection of common design criteria to help ensure uniformity and compatibility among future individual projects. Details such as the exact capacity of individual projects, the level of redundancy, the location of facilities, the alignment and depth of pipelines, the extent of utility conflicts, the cost of land and easements, the construction methodology, the types of equipment and material to be used, the time of construction, interest

and inflation rates, permitting requirements, etc., are typically developed during the more detailed levels of design.

SYSTEM IMPROVEMENT PROJECTS

All projects recommended in previous chapters of this report are summarized in Table 6-1 (table continues on to page 6-3). The Map ID corresponds to the project number on Figure 5-2, Recommended Capital Facility Projects, located at the end of Chapter 5.

Table 6-1: Recommended Capital Facility Projects

Type	Map ID	Project Description	Cost
Projects to Revise Pressure Zones			
Internal Zone Connectivity	1	State Street/7200 South	$50,000
	2	State Street/Inglenook Drive	$50,000
	3	7800 South, Sandra Way to 200 East	$105,000
	4	8000 South, 100 East to 150 East	$88,000
	5	Greenwood Ave, 270 East to Regent Park Lane	$66,000
Connection Between Zones	6	900 East Fairmeadows Drive PRV/Check Valve	$50,000
	7	700 East 7200 South PRV/Check Valve	$50,000
Total Cost, Projects to Revise Pressure Zones			**$459,000**
Projects to Mitigate Existing Fire Flow Deficiencies			
Fire Suppression Flow	8	Splendor View Circle (6815 South) to 6850 South	$42,000
	9	Depot Street, Holden Street to Main Street	$66,000
	10	Center Street, Main Street to LePage Street	$20,000
	11	Cooper Street, south of Center Street	$72,000
	12	Alta View Drive, east of Chapel Street	$63,000
	13	Olympus Circle, north of Garden View Dr.	$101,000
	14	Cox Street, State Street to Rusty Drive	$132,000
Total Cost, Projects to Mitigate Existing Fire Flow Deficiencies			**$496,000**

(Table continues...)

Type	Map ID	Project Description	Cost
Projects to Replace Existing Transmission Lines			
Transite Pipe Replacement	15	Southcrest Circle, west of 900 East	$50,000
	16	900 East, Casa Negra to Lyndy Drive	$50,000
	17	Casa Blanca Drive, 7575 South, and Casa Verde Street	$105,000
	18	7575 South (not in street), Casa Negra Circle to 1000 East	$88,000
	19	Mecham Lane (7575 South), east of 1000 East	$66,000
	20	Wood Street, Marquette Dr. (north) to Princeton Drive	$208,000
Transmission Realignment	21	North of Resaca Street and State Street, Resaca to 8000 South	$700,000
Total Cost, Replacement Projects			**$1,267,000**
Projects to Accommodate Future Demand			
Transmission	22	700 East, JVWCD Connection (7600 South) to 7200 South	$906,000
Transmission	23	700 East, 7200 South to Downing Street	$204,000
Transmission	24	7200 South, 300 East to 700 East	$716,000
Transmission	25	7200 South, Ramanee Drive to 300 East	$264,000
Transmission	26	7200 South, State Street to Ramanee Drive	$272,000
Transmission	27	1000 East, JVWCD Connection to Casa Roja Street	$149,000
Transmission	28	1000 East, Casa Roja Street to Union Creek Way	$432,000
Transmission	29	North Union Avenue	$264,000
Transmission	30	7800 South, Devin Place to 1200 East	$480,000
Transmission	31	700 West, Winchester Street to 6980 South	$657,000
Transmission	32	Transmission from proposed tank to City[1]	$2,480,000
Source Redundancy	33	Replace/redevelop Oak Street or Park Street well	$2,000,000
Source	34	Vault for JVWCD connection at 700 West Winchester Street	$200,000
Source	35	Upgrade vault for JVWCD connection at 175 West 7500 South	$200,000
Storage	36	4.0 MG tank for Midvale pressure zone	$6,300,000
Storage	37	1.8 MG tank for Midvale pressure zone	$2,800,000
Storage	38	3.2 MG tank for North Union & South Union pressure zones	$5,100,000
Total Cost, Projects for Future Demand			**$23,424,000**
Annual Replacement of Aging Pipes			
Annual Cost to Replace Aging Pipes (pipes over 50-year cycle)			**$2,308,000**

[1] - Transmission costs for the proposed storage tank will increase if the tank is located farther from the City.

The following recommendations shown in Table 6-2 were discussed in this plan, but no costs have been evaluated.

Table 6-2: Additional Recommendations

Recommendation
Determine beneficial use for water right 57-2699
File change application to add Oak Street well as point of diversion to water rights 57-1738 and 57-1492
Proof recent change orders as part of the ongoing adjudication
Create forecasting/tracking system for JVWCD water and water rights and evaluate annually
Maintain emergency interconnections with Sandy City

SUMMARY OF COSTS

Table 6-3 includes projects shown in Table 6-1 and is a summary of project costs through 2060. This cost represents a best estimate for total cost in 2020 dollars to maintain the desired level of service while accommodating future growth through 2060 conditions. This table does not include any financing costs associated with funding options.

Table 6-3: Summary of Costs

Project Type	Cost
Revise Pressure Zones	$459,000
Mitigate Existing Fire Flow Deficiencies	$496,000
Replace Existing Transmission Lines	$1,267,000
Accommodate Future Demand	$23,424,000
Total	**$25,646,000**
Plus Annual Replacement of Aging Pipes	**$2,308,000**

FUNDING OPTIONS

Funding options for the recommended projects, in addition to water use fees, could include general obligation bonds, revenue bonds, State/Federal grants and loans, and impact fees. The City may need to consider a combination of these funding options. The following discussion describes each option.

General Obligation Bonds

This form of debt enables the City to issue general obligation bonds for capital improvements and replacement. General Obligation (G.O.) bonds would be used for items not typically financed through the Water Revenue Bonds. For example, the purchase of water source to ensure a sufficient water supply for the City in the future. G.O. bonds are debt instruments backed by the full faith and credit of the City, which would be secured by an unconditional pledge of the City to levy assessments, charges or ad valorem taxes necessary to retire the bonds. G.O. bonds are the lowest-cost form of debt financing available to local governments. G.O. bonds can be combined with other revenue sources, such as specific fees, or special assessment charges to form a dual security through the City's revenue generating authority. These bonds are supported by the City as a whole, so the amount of debt issued for the water system is limited to a fixed percentage of the real market value for taxable property within the City.

Revenue Bonds

Revenue Bonds are another form of debt financing available for utility-related capital improvements. Unlike G.O. bonds, revenue bonds are not backed by the City as a whole, but constitute a lien against the water service charge revenues of a water utility. Revenue bonds are riskier to the investor than G.O. bonds, since repayment of debt depends on an adequate revenue stream, legally defensible rate structure and sound fiscal management by the issuing jurisdiction. Due to this increased risk, revenue bonds generally require a higher interest rate than G.O. bonds. Interest rates are currently at historic lows. This type of debt also has very specific coverage requirements in the form of a reserve fund specifying an amount, usually expressed in terms of average or maximum debt service due in any future year. This debt service is required to be held as a cash reserve for annual debt service payment to the benefit of bondholders. Typically, voter approval is not required when issuing revenue bonds.

State/Federal Grants and Loans

Historically, both local and county governments have experienced significant infrastructure funding support from state and federal government agencies in the form of block grants, direct grants in aid, interagency loans, and general revenue sharing. State/federal grants and loans should be further investigated as a possible funding source for needed water system improvements.

As with the revenue bonds discussed earlier, the ability of infrastructure programs to wisely manage their finances will be a key element in evaluating whether many secondary funding sources, such as federal/state loans, will be available to the City.

Impact Fees

Impact fees can be applied to water related facilities under the Utah Impact Fees Act. The Utah Impacts Fees Act is designed to provide a logical and clear framework for establishing new development assessments. It is also designed to establish the basis for the fee calculation which the City must follow in order to comply with the statute. However, the fundamental objective for the fee structure is the imposition on new development of only those costs associated with providing or expanding water infrastructure to meet the capacity needs created by that specific new development. Also, impact fees cannot be applied retroactively. Though Midvale City has not imposed impact fees in recent years, it may be a possibility for future development.

SUMMARY OF RECOMMENDATIONS

Several recommendations were made throughout the master plan report. The following is a summary of the recommendations.

1. Reconfigure the existing pressure zones to create a larger Midvale pressure zone, with the area east of 700 East/900 East remaining an upper zone (two sub-zones) served by JVWCD.

2. Determine a beneficial use for water right 57-2699 or exchange it for a right usable by the City.

3. Amend water rights 57-1738 and 57-1492 to include the Oak Street well as a point of diversion.

4. Elect to have recently approved change applications proofed as part of the ongoing water rights adjudication.

5. Monitor the Average Yearly Demand and use a forecasting and tracking system to ensure the JVWCD contract is neither too high or too low to responsibly meet the needs of the City's drinking water system.

6. Obtain a JVWCD connection at Winchester Street and 700 West.

7. Increase the capacity of the JVWCD connection at 175 West 7500 South, 700 East 7610 South, and 1000 East 7800 South.

8. Consider redeveloping Oak Street well and/or possibly Park Street well to provide full beneficial use of City water rights and provide additional redundancy.

9. Maintain connections from the Sandy City system for emergency use.

10. Pursue negotiations with JVWCD to continue to provide storage volume for the City (at a minimum for the new North Union and South Union pressure zones).

11. Pursue acquiring property appropriate for a storage tank for the Midvale pressure zone.

12. Complete the Existing and Future Recommended Projects.

13. Continue to update the model as the water system changes (including verification of pipe diameters) and use the model as a tool for determining the effect of changes to the system and capacity of the system to provide fire flows.

14. Continue to conduct fire flow tests on an ongoing basis to refine the model calibration as system conditions change.

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APPENDIX A
Growth Projections and Projected ERCs

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Table A-1
Growth Projections and Projected ERCs

Year	Projected ERCs	Annual ERC Growth
2020	13,940	-
2021	14,298	2.8%
2022	14,667	2.8%
2023	15,045	2.8%
2024	15,435	2.8%
2025	15,836	2.8%
2026	16,248	2.8%
2027	16,672	2.8%
2028	17,108	2.8%
2029	17,556	2.8%
2030	18,017	2.8%
2031	18,194	1.1%
2032	18,372	1.1%
2033	18,552	1.1%
2034	18,735	1.1%
2035	18,919	1.1%
2036	19,105	1.1%
2037	19,293	1.1%
2038	19,483	1.1%
2039	19,676	1.1%
2040	19,870	1.1%
2041	20,047	1.0%
2042	20,226	1.0%
2043	20,407	1.0%
2044	20,590	1.0%
2045	20,774	1.0%
2046	20,961	1.0%
2047	21,149	1.0%
2048	21,338	1.0%
2049	21,530	1.0%
2050	21,723	1.0%
2051	21,901	0.9%
2052	22,081	0.9%
2053	22,262	0.9%
2054	22,445	0.9%
2055	22,630	0.9%
2056	22,816	0.9%
2057	23,004	0.9%
2058	23,193	0.9%
2059	23,384	0.9%
2060	23,577	0.9%

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APPENDIX B
Water Rights

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State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WATER RIGHTS

Michael O. Leavitt
Governor
Robert L. Morgan
Executive Director
Jerry D. Olds
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June 25, 2002

Salt Lake Valley Groundwater Users:

Enclosed is the final Salt Lake Valley Groundwater Management Plan which replaces the interim plan implemented in 1991. Although we are implementing this management plan on a "permanent" rather than on an interim basis, we are allowing for the prospect of modifying this plan in the future as conditions change. Modification to this management plan would occur in consultation with water users and other interested parties.

We have received numerous comments and a lot of input during the development of this plan. We would like to thank all of those who have contributed to this process. Many of the provisions in this plan reflect the concerns and issues raised by many of you.

In addition, we have relied heavily on data, information, and computer models which were developed by the United States Geological Survey. The publications containing much of this data and information and other related documents are available on the division's website – waterrights.utah.gov.

The water rights configuration in Salt Lake Valley is complex and offers many unique challenges for both water users and water managers. We believe that this management plan adequately addresses these challenges. We also believe that this will be a useful tool in helping water users plan for future development as well as help this division in the administration and management of this precious resource. We ask for your continued support.

Sincerely,

Jerry D. Olds

Jerry D. Olds, P.E.
Utah State Engineer

Introduction

This document presents the state engineer's policy for the management of the ground-water resources of Salt Lake Valley. The objectives of this ground-water management plan are to promote wise use of the ground-water resource, to protect existing water rights, and to address water quality issues and over-appropriation of ground water in the valley. In implementing this ground-water management plan, the state engineer is using his statutory authority to administer the measurement, appropriation, and distribution of the ground water of Salt Lake Valley. The intent of this plan is to provide specific management guidelines under the broader statutory provisions within Title 73 of the Utah Code.

For the purposes of this plan, the Salt Lake Valley consists of the unconsolidated basin-fill material generally bounded by the Wasatch Range to the east, Oquirrh Range to the west, Great Salt Lake to the north, and Traverse Mountains to the south. This area is shown in Figure 1.

Salt Lake Valley Ground-Water Management Plan

The following policy guidelines are hereby implemented effective June 25, 2002:

1.0 Appropriations

The Salt Lake Valley is closed to new appropriations of ground water from the principal aquifer including fixed-time appropriations. This action is necessary because of the over-appropriation of water resources of the valley. All pending unapproved applications in the principal aquifer will be rejected. In addition, the state engineer will hold all applications to appropriate water from the shallow aquifer until further review and study of this source is conducted.

2.0 Ground-Water Withdrawal Limits

In order to fulfill the objectives of this management plan, guidelines are being implemented to help distribute ground-water withdrawals. If excessive withdrawals occur, the state engineer will distribute the water in accordance with the priority dates of the applicable water rights using the following guidelines:

2.1 Safe Yield from the Principal Aquifer

Salt Lake Valley has been divided into four regions: western, eastern, central, and northern as shown in Figure 1. The state engineer may limit the quantity of water withdrawn in these regions so that the average amount of water withdrawn over the long term does not exceed the safe yield. The safe yield of each region has been estimated and is shown in Table 1 below.

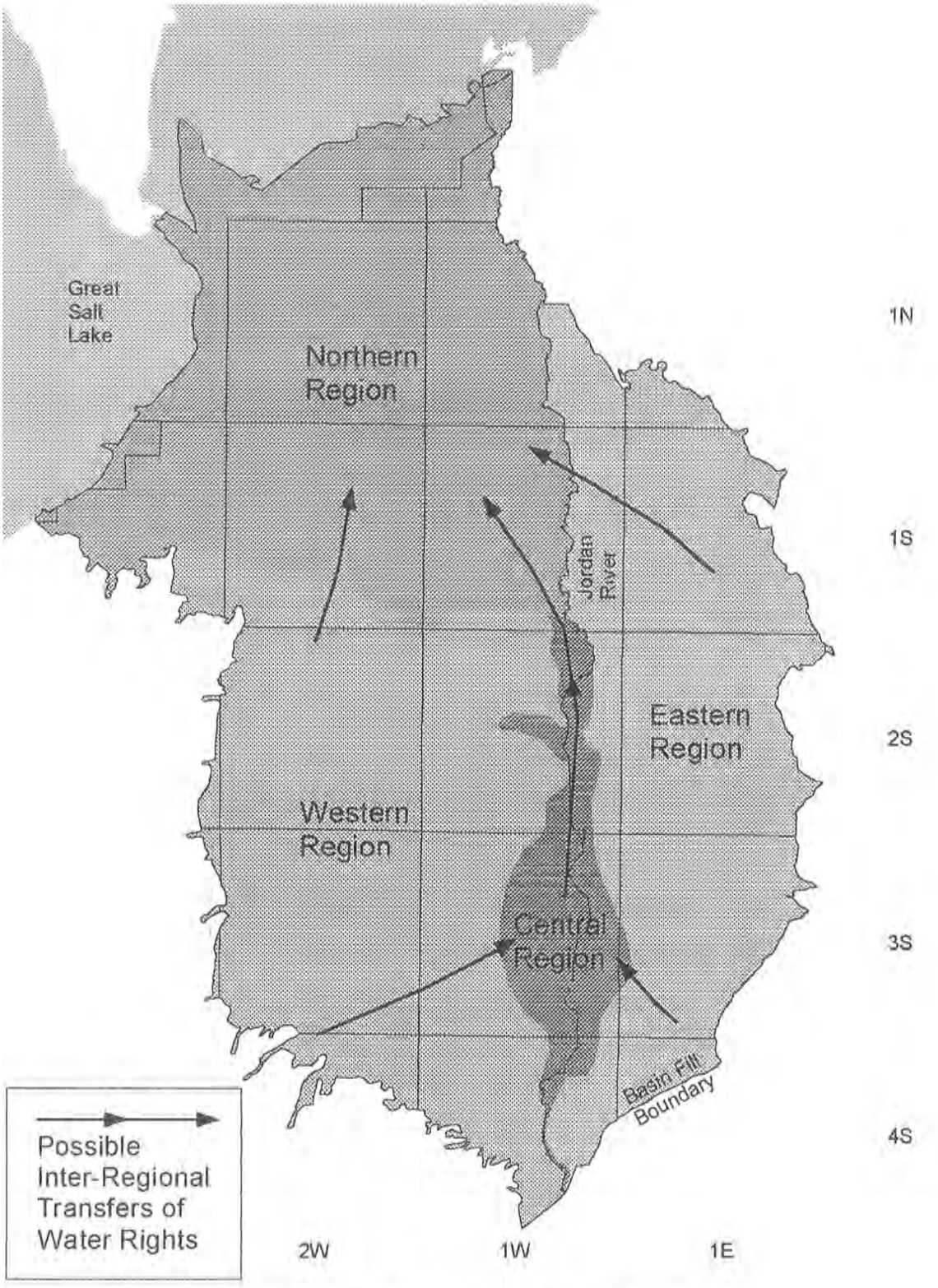

Figure 1. Salt Lake Valley Ground-Water Management Plan Regions

Table 1. Regional Safe Yields

Region	Safe Yield (acre-feet per year)
Western	25,000
Eastern	90,000
Central	20,000
Northern	30,000

2.2 Localized Ground-Water Withdrawals

The state engineer may limit withdrawals in any area of the valley where excessive withdrawals are causing definite and significant harm to the ground-water system. The state engineer recognizes that there are many different factors to consider in determining when and where this is occurring. Some of the relevant factors to consider are:

- ground-water level trends
- trends in the amount of ground-water withdrawals
- changes in water quality
- recent climatic conditions
- local hydro-geologic conditions

Upon identifying areas where excessive withdrawals are causing harm to the aquifer and after public review and commentary on applicable data, the state engineer may limit the withdrawals in that area according to the priority dates of each applicable water right and in harmony with all applicable state statutes. The total quantity of ground water restricted from withdrawal will correspond to at least the quantity necessary to preclude further harm to the aquifer system. Further pumping restrictions may be imposed if harm to the ground-water system worsens. Pumping restrictions may also be lifted in part or in whole after the ground-water system has recovered to an acceptable level, provided no future reoccurrences of the conditions which caused the harm are anticipated.

2.3 Ground-Water Withdrawals From the Southwestern Portion of the Valley

A portion of the aquifer in the Southwestern part of the valley is being remediated by the removal of contamination associated with past mining practices. As part of the remediation effort, Kennecott Utah Copper Corporation (KUCC) has committed to assist affected water users obtain adequate replacement water if adversely affected. Applications in this area which propose to change the point of diversion or drill a replacement well will be critically reviewed so as not to interfere with the remediation process. In conjunction with this, KUCC has committed to work with applicants to determine if there is a feasible well location, depth, and pumping rate for future wells in the contaminated area. The contaminated area is defined as extending 3000 feet from the known 250 mg/l sulfate isoconcentration contour. The approximate boundary for this area is shown in Figure 2.

3.0 Applications to Change the Point of Diversion, Place of Use, and/or Purpose of Use
Each change application will be evaluated based upon its own merits. Within the statutory requirements, the evaluation may consider – but will not necessarily be limited to – potential impacts on: existing water rights, the ground-water system, and overall water quality. In addition, the following guidelines will be used when evaluating change applications:

1) Change applications that propose to transfer water rights historically supplied from the shallow aquifer to the principal aquifer will not be approved.
2) Change applications that propose to transfer water rights into the eastern region, into the western region, or out of the northern region will not be approved. (See Figure 1.)
3) Change applications that propose to transfer water rights into a restricted area[1] will not be approved. (See Figure 2 and endnotes for details.)
4) Change applications that propose to transfer water rights into a section where the Transfer Index Number (TIN[2])under the current water rights exceed the limits set forth in Table 2 below will only be considered if the applicant can show that:
   a) There is sufficient reason to believe that existing water rights will not be impaired.
   b) Compensation and/or adequate replacement water will be provided to existing water right holders if impairment occurs.
   c) Additional ground-water withdrawals will not significantly reduce water levels, degrade the water quality, or otherwise negatively impact the ground-water system.

Table 2. Regional Transfer Index Number Limits

Region	**TIN Limits (acre-feet per year)**
Western	4,000
Eastern	12,000
Central	6,000
Northern	6,000

5) Change applications that propose to transfer water rights between sections that have Transfer Index Numbers exceeding the limits set forth in Table 2 may be approved provided that the TIN in the hereafter section is at most 75% of the TIN of the heretofore section and the criteria listed under items 1-4 above have been met.
6) Change applications that propose to drill a replacement well within a distance of 2,640 feet from the original point of diversion may be approved provided that the criteria listed under items 1 and 3, above, have been met.

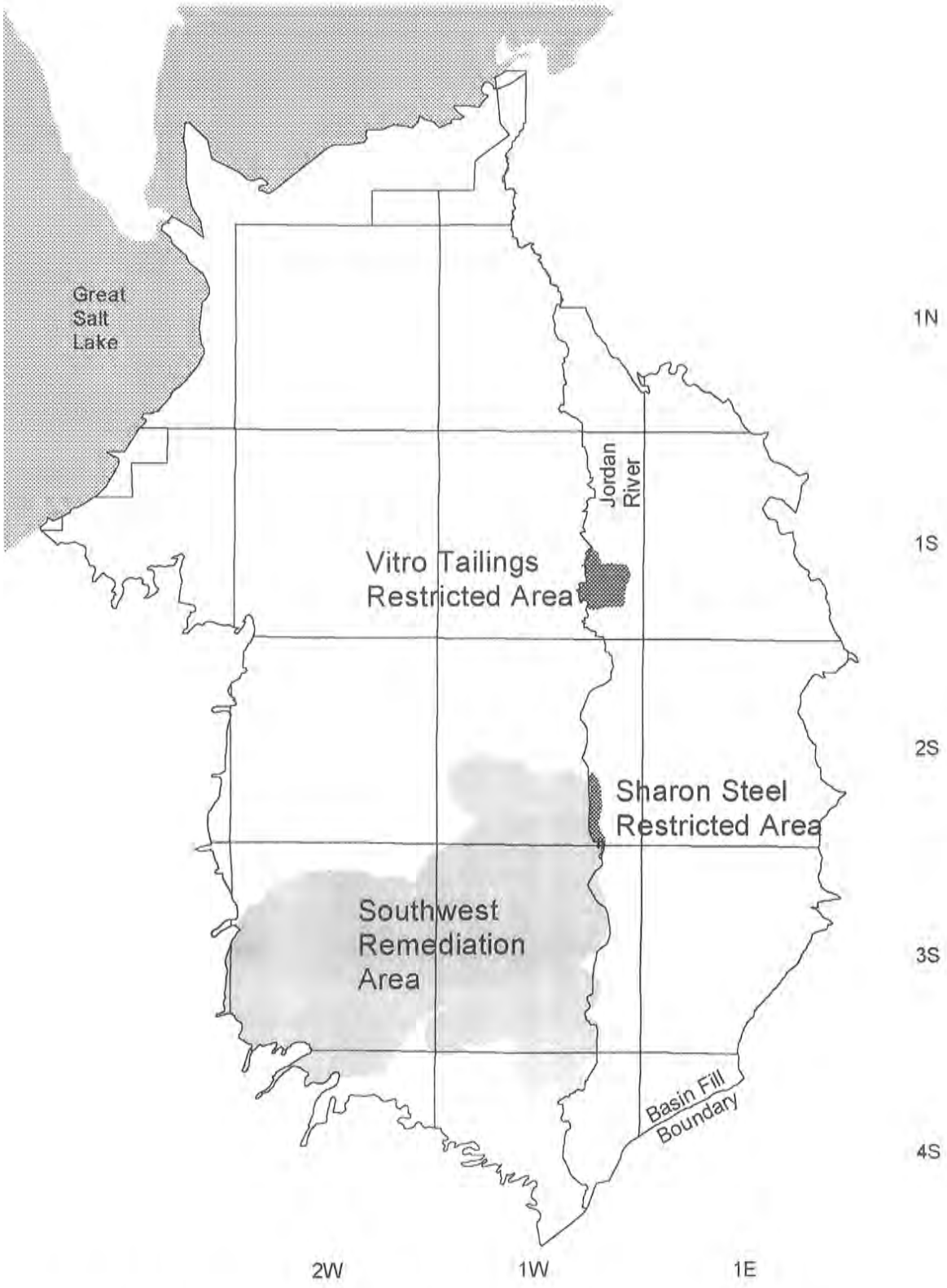

Figure 2. Salt Lake Valley Restricted Areas and Southwest Remediation Area

4.0 Well Spacing

Each new well should be designed, constructed, and operated so that, when pumped at its maximum flow rate, it will not cause more than 12 feet of draw down on an existing well unless the owner of the new well provides just compensation to the affected well owner(s).

5.0 Extensions of Time for Water Right Applications

The state engineer will critically review all future extension requests on approved applications to appropriate or change water pursuant to Section 73-3-12 of the Utah Code. When reviewing extension requests, if unjustified delays or a lack of due diligence is found, the state engineer may reduce the priority date, grant the request in part, or deny the extension of time request.

6.0 Ground-Water Remediation Projects

The state engineer will evaluate each proposed ground-water remediation project based upon its own merits. In order to allow for remediation of ground water the state engineer may support withdrawal amounts in excess of the regional safe yield values outlined in Section 2.1 above or allow changes that would exceed the limits set forth in Section 3.0 above if it is determined to be in the best interest of the public and has a specific project life.

7.0 Aquifer Storage Recovery (ASR)

The state engineer will evaluate each proposed ASR project based upon its own merits. In general, withdrawals credited from aquifer recharge will not count towards the safe yield values outlined in Section 2.1 above. Some of the factors that will be considered in the evaluation of potential ASR projects are:

- hydro-geologic properties of the aquifer
- ground-water velocities
- amount of time between recharge and recovery
- potential effect on other water rights

Applicants may be required to monitor the effects of ASR projects to ensure that no unreasonable impact to the ground-water system or other water rights occurs.

8.0 Monitoring Activities and Aquifer Status Update

The Division of Water Rights will monitor water quality reports submitted by water users to the Department of Environmental Quality and periodically produce an updated, valley-wide water quality summary. Additionally, the division will provide water use information. Also, the division will review new pertinent data that further, or more accurately, defines the ground-water flow system and hydro-geology of Salt Lake Valley and will modify the plan if necessary. Any modifications to the plan will occur in consultation with water users and other interested parties.

June 25, 2002
Date

Jerry D. Olds
Jerry D. Olds, P.E.
Utah State Engineer

Endnotes

1. Restricted Areas

There are two restricted areas currently in the plan associated with the following contaminated sites as shown in Figure 2:

- Vitro Tailings Site
- Sharon Steel Site

In order to protect the quality of the water by preventing changes in the hydraulic gradient and mobilization of contaminants at these contaminated sites, the transfer of water rights into these areas will not be allowed. Restricted areas are based on available data and may change as new data is obtained. New restricted areas may be added to the plan upon request to the state engineer if an evaluation of the data supports such designation, and the public has had an opportunity to review the data and comment on the proposed designation.

2. Transfer Index Number (TIN)

Under the U.S. Public Land Survey system, the land is divided into township, range, and section. Each section is a square measuring approximately one mile on each side. In this management plan, each section in the valley fill of the Salt Lake Valley is assigned a Transfer Index Number which is based on the index values of every water use within that and each of the eight adjacent sections.

There are specific rules for calculating a section's TIN, which has units of acre-feet per year. A TIN may change over time as the water rights situation changes. The primary rules for calculating a section's TIN are outlined below.

1. Only approved and perfected, i.e. certificated, water rights are evaluated. Approved (but unperfected) changes on perfected water rights are not evaluated because of double accounting issues. Water rights under active litigation are not evaluated.
2. Only wells (both flowing and pumped) are evaluated. Tunnels, springs, drains, and other types of non-well, "underground" diversions are not evaluated.
3. Index values for indoor domestic uses are calculated at 0.45 acre-feet per family.
4. Index values for stock-watering uses are calculated at 0.028 acre-feet per equivalent livestock unit (ELU).
5. Index values for irrigation uses are calculated at 5 acre-feet per acre of irrigated land. If there is a sole supply acreage listed, the irrigation index value is equal to the number of sole supply acres multiplied by an irrigation duty of 5.
6. Index values for domestic, stock-watering, and irrigation uses are calculated by dividing the index value of a claims group by the number of supplemental rights in that group.
7. Index values for municipal uses are calculated by multiplying the flow rate (cfs) by 362.
8. Index values for industrial, mining, and other uses are calculated by multiplying the flow rate (cfs) by 181.

9. The total index value for a water right is the sum of the index values of all listed uses but will not exceed the maximum diversion volume (if listed on the right) nor the maximum flow rate (cfs) multiplied by 724.
10. The total index value for a particular water right is divided evenly between each point of diversion listed under that water right.
11. Index values are calculated for each point of diversion in a section and summed up for the section in question and every adjacent section. This has been done for section 11 in the example below. *(Note: The TIN for section 11 is not 500.)*

3 800	**2** 1600	**1** 2100
10 2600	**11** 500	**12** 1200
15 3300	**14** 1100	**13** 900

Figure A. Evaluating water rights in all adjacent sections

12. A section's TIN is the *maximum sum* of any four adjacent section index values. In the figure below, section 11 has a TIN of 7,500 acre-feet per year.

3 800	**2** 1600	**1** 2100
10 2600	**11** 500	**12** 1200
15 3300	**14** 1100	**13** 900

Sum = 5500

3 800	**2** 1600	**1** 2100
10 2600	**11** 500	**12** 1200
15 3300	**14** 1100	**13** 900

Sum = 5400

3 800	**2** 1600	**1** 2100
10 2600	**11** 500	**12** 1200
15 3300	**14** 1100	**13** 900

Sum = 7500

3 800	**2** 1600	**1** 2100
10 2600	**11** 500	**12** 1200
15 3300	**14** 1100	**13** 900

Sum = 3700

Figure B. Determining the TIN for a particular section by calculating the maximum sum

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APPENDIX C
Calibration Data

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Month July Year 2019 Million Gallon

Date	Time	Pump Level	Static Level	Tank AM	Tank Noon	Tank PM	Meter Reading (OOO)	GPM On/Off	Remarks	By
1		419.8		14.5			2245752.2	2142		RG/BS
2	8:28	410.9		16.2			3288325	2145		BS/RG
3	8:24	414.3		14.0			4463058	2156		AA/RG
4	10:00	411.7		17.4		18.1	7756275	2136		BB
5	8:39	424.4		15.1			8027089	0		AA/RG
6	10:30	419		15.4		17.1	9328206	2145		BB
7	10:50	418.1		15.8		17.5	4977876	2148		BB
8	8:47	418.1		14.0			1282969	0		ER/MC
9	8:41	413.1		13.7			3760240	2148		BS/ER
10	8:27	411.8		15.4			6797294	2145		RG/AA
11	8:58	415.7		14.5			7944090			BS/ER
12	8:46	415.9		13.9			8633900			ER/BS
13	10:09	408.0		15.8		18.0	1015493	2129		Lalo
14	8:59	411.8		14.5		17.3	1854009			Lalo
15	8:32	409.2		13.6			"			RG/BS
16	8:24	402.7		14.7			4887857	2126		BS/RG
17	8:49	459.3		11.5	11.11	10.1	8216814	2184		AA/LALO
18	7:39	463.3		5.9	6.9	8.5	1187876	2169	9.7	BS/TF
19	7:15	427.1		9.3	14.1	16.4	4232780	2164		TF
20	8:[illegible]	[illegible]		17.3	18.7	16.6	7413702	2185		TF
21	8:50	412.6		15.5	18.9	17.6	245 5015	2127	5:18	TF
22	8:36	412.7		15.0	17.8	17.5	6502245	2128		
23	8:34	403.8		14.2			~~[illegible]~~ 9654662	2146	17.7	AA/TF
24	7:59	398.5		15.0		17.2	2637695	2136	17.2	MC
25	8:30	400.1		15.0			5819745	2133		AA/RG
26	8:36	399.9		14.1			9021986	2122		ER/BS
27	9:24	400.6		15.5		17.7	2189186	2134		MC
28	8:41	402.1		14.8		17.4	5274289	2137	17.4	MC
29	8:42	400.0		14.0			8389758	2127		BS/RG
30	8:50	396		15.2			~~1461~~ 1462533	~~[illegible]~~	2133	TF
31	8:38	397.6		14.0			4740837	2119		ER/AA
~~August 1~~ 8:21		~~[illegible]~~		~~[illegible]~~			~~[illegible]~~	~~[illegible]~~		~~[illegible]~~

Month August Year 2019 Million Gallon

...e	Time	Pump Level	Static Level	Tank AM	Tank Noon	Tank PM	Meter Reading (OOO)	GPM On/Off	Remarks	By
1	6:21	399.9		15.4			7863582	2138		AA
2	8:24	399.7		14.5			1171196	2132		AA
3	9:10	396.4		14.7		CH	2122.9	2132	16.5 min	CH
4	6:30	395		16.6		CH	2268646	2122	[illegible]	CH
5	9:09	399.2		15.0			433744	2139		ER/TF
6	8:30	394.8		16.6			3402666	2126		ER/TF
7	8:54	397.2		15.1			6523894	2118		BS/RG
8	8:18	391.3		16.0			9510538	2121		RG/ER
9	9:06	397.7		15.8			2647000	2119		LeLo
10	8:03	400.4		16.3		JW	5589155	2118		JW
11	8:34	457.1		11.9			8761472	2168		JW
12	8:50	402.0		12.7			1886735	2134		BS
13	8:39	397.9		18.3			4904916	2120		BS
14	8:45	402.4		15.3			8068400	2125		ER/BS
15	8:16	404.0		16.4			987684	2115		ER/RC
6	9:10	402.0		15.7			4436356	2118		ER/BS
17	9:57	399.8		16.8		18.6	7636815	2108		RG
18	12:05	397.9		17.6		19.0	1130458	2107		RG
19	11:37	399.1		15.1			3730352	2124		ER/TF
20	7:45	396.7		16.2			6813526	2116		RG/BS
21	7:50	391.4		15.2			9889836	2123		BS/RG
22	7:50	389.0		15.7			2947856	2136		mp/tf
23	7:55	390.1		15.3			6025996	2138		BS
24	9:27	386.9		16.5		19.0	9404822	2131		BS
25	9:35	387.1		16.3		18.9	24B3022	2125		BS
26	7:59	387.1		14.9			5211332	2134		BS
27	8:00	382.7		17.3			8242997	2105.2		TF
28	8:05	387.7		14.2			1189971	2125		AA/BS
29	7:31	442.6		16.1			4194932	2165		AA
30	7:19	451.3		14.5			7089713	2163		MC
31	8:17	397.7		17.2			116050.5	2120	14.7	MC

18.9

17.0

13.4

Hancock Well Report **Midvale City**

Month July Year 2019

Date	Time	Meter Reading (000)	Mag Meter Total	Flow Rate	Peak	Pump Gpm	Pump Level	Static Level	Remarks	By
1	8:35	62/9301	8143K	4760		1948	342.2		14.5	RG
2	8:30	8984158	8049K	5130		1955	341.3		16.2	RG
3	8:26	1779887	9031K	5760		1943	336.7		14.0	BB
4	10:00	1176076	8030K	4060		1930	335		17.4	RG
5	8:43	74049187	8378K	4250		1945	345.9		15.1	BB
6	10:35	157 4375	8172K	3484		1940	341		15.4	
7	1050	6290778	8972K	3502		1943	340.1		15.8	
8	8:51	5822997	89723	4546		1946	339.3		14.0	BS CR
9	8:44	8589074	8838K	4770		1942	333.9		13.7	RG
10	8:29	1339224	10058K	5320		1957			15.4	EA BS
11	9:03	4196197	8828K	4560		1926	337.3		14.6	ER BS
12	9:48	8960309	8828K	6440		1936	336.3		13.9	EA
13	10:12	9891092	9134K	4640		1924	330.4		15.8 18.0	EA
14	9:02	2551560	8559K	4520		1926	333.4		14.5 17.3	RG
15	8:34	5281147	8559K	6120		1935	330.2		13.6	RG
16	8:25	8032900	9195K	5280		1935	333.2		14.7	AA
17	8:53	6974.84	9380K	5010		1976	—	375.4	15.0 15.0	
18										RG
19	8:25	1610956	9380K	5000		1976	375.4		15.0 14.1	TF
20	8:46	4216416	1062K	3850		1917	327.8		17.3 18.7	TF
21	8:55	5571498	7145K	3330		1925	337.6		15.8 18.9 17.5	BS CR
22	8:35	7150150	7145K	4520		1930	338.1		15.0 17.8	AA TF
23	8:40	9941493	7819K	5800		1940	327.5		14.2	AC
24	8:03	2639833	9029K	6053		1927	322.6		15.0 17.2	RG
25	8:34	5475236	9334K	5020		1935	323.91		15.	BS CR
26	8:39	8264816	8697K	5810		1929	322.6		14.1	AC
27	9:26	1137887	8063K	3520		1925	323.2		15.5 17.7	AC
28	8:44	3838554	8386K	4567			324.3		14.8 17.4	RG
29	8:45	6186792	8439K	5560		1936	321.4		14.0	TF
30		9401516	9281K	4500			317.7		15?	AA ER
31	8:40	2146943	9281K	5604		1931	319.0		14.0	BS

Hancock Well Report — **Midvale City**

Month August Year 2019

Date	Time	Meter Reading (000)	Mag Meter Total	Flow Rate	Peak	Pump Gpm	Pump Level	Static Level	Remarks	By
1	8:24	4896102	9324K	4360		1934	320.2		15.4	RG
2	8:27	7688981	7809K	6610		1933	320.3		14.5	RG
3	9:24	24	6769	4734		143	312.6		14.7	CH
4	6:39	2494209	6240	4534		1916	318		16.6 18.9	CH
5	9:12	4702838	4770976	4970		1935	322.0		15.0	TE
6	8:35	7393338	9076K	4930		1917	317.7		16.6	ER
7	8:56	9063216	8934K	4720		1934	320.1		15.1	RG
8	8:20	1034319	8933	4740		1931	315.2		16.0	RG
9	9:09	3028650	7183K	3740		1919	320.5		15.8	ER
10	8:10	647.935	7430	4460		1931	323.6		16.3 17.0	JW
11	8:40		99K	0		1926			11.9	JW 13.4
12	8:53	5913438	8059K	4990		1943	324.2		12.7	BS
13	8:42	8651056	8547K	4610		1922	321.7		18.3	BS
14	8:44	2284604	8289K	4610		1917	325.5		15.3	ER
15	8:19	2225588	8895K	5320		1924	327.1		16.4	RG
16	9:18	4186525	8569K	4790		1930	324.7		15.8	BS ER
17	10:11	6224371	8037K	3980		1930	322.7		16.8 17.2	RG
18	12:07	8360165	8259K	3480		1921	321.2		17.6 19.0	RG
19	7:41	9784645	8259K	6930		1924	321.6		15.1	TE LR
20	7:48	1475659	8712K	5650		1926	320.5		16.2	RG BS
21	7.52	3094954	90071K	5680		1933	314.7		15.2	BS RG
22	7:53	5168392	8600K	5810		1934	312.8		15.7	MHO TE
23	7:59	6878877	8518K	6270		1928	313.9		15.3	BS
24	9:30	9168172	8380K	4110		1926	311.3		16.5 19.0	BS
25	9:38	9494550	8430K	3580		1923	311.1		16.4 18.9	BS
26	8:02	2601149	8430K	6050		1929	310.5		14.9	TE
27	8:05	5360341	9043K	4990		1920	309.0		12.3	AA BS
28	8:12	7194876	8380K	5480		1933	310.1		14.2	AA
29	7:35	7798338	6143	4760		0	615.7		16.1	MC
30	7:24	7796338	6106K	5439		0	625.8		14.5	MC
31	8:20	9604444	5855K	3725			321.2		17.2 18.7	

OAK Strt **Well Report** **Midvale City**

Month July Year 2019

Date	Time	Meter Reading	Pump Level	Static Level	Oil 6-8DPM	PSI	GPM	Remarks	By
1	8:19	2035650	264		✓	95.0	822.38	1620RPm	BS/RG
2	8:15	2036690	262		✓	95.5	794.44	1605 RPM	RG/BS
3	8:14	2037668	264		✓	95.4	822.41	1620 RPM	RG/AA
4	9:04	2039637	261		✓	95.6	717.41	1566 RPM	RG/AA
5	↓	↓	↓		↓	↓	↓	↓	↓
6	10:20	2040678	261		✓	~~95.4~~ 95.4	643.5	1512	BB
7	10:40	2041717	264		✓	99.5	610	1522	BB
8		POWER OUT				~~95.5~~		~~1620~~	~~E~~
9	8:26	2042532	263		✓	95.5	813	1620	ER/BS
10	8:15	2043600	269		✓	95.5	818.74	1620	RG/AA
11	8:33	2044635	263		✓	95.5	821.74	1620 RPm	BS/ER
12	8:32	2045658	263		✓	94.8	818.86	1620 RPm	BS/GR
13	9:55	2046794	262		✓	95.5	695.10	1566 RPm	LaLo
14	8:46	2047730	262		✓	95.5	762.47	1602 RPm	LaLo
15	8:21	2048740	264		✓	94.2	828.89	1620 RPm	BS/RG
16	8:12	2049827	263		✓	95.2	812.74	1620 RPM	RG/BS
17	8:35	2050888	263		✓	94.4	829.19	1620 RPM	AA/CALO
18	8:45	2052080	263		✓	95.5	838.63	1620	TF/BS
19	9:37	2053345	269		✓	94.8	817.36	1620	RG
20	5:38	2054511	260		✓	95.5	714.35	1431	TF
21	9:15	2055196	266		✓	95.5	670.17	1521	TF
22	8:24	2056021	263		✓	95.6	790.58	1605 RPm	BS/GR
23	8:20	2057020	264		✓	95.5	831.71	1620	TF/AA
24	8:31	2058083	265		✓	95.5	815.06	1620	MC
25	8:21	2059040	263		✓	95.3	817.52	1620	RG/AA
26	8:24	2060095	264		✓	93.8	835.48	1620 RPm	BS/ER
27	9 11	2061124	260		✓	95.5	656.86	1557	MC
28	8:31	2062067	262		✓	95.5	803.64	1614	MC
29	8.30	2063073	264		✓	94.7	818.56	1620RPm	BS/RG
30	8:20	2064159	266		✓	95.5	781.66	1614	TF
31	8:25	2065133	263		✓	94.9	818.70	1620	AA/CALO

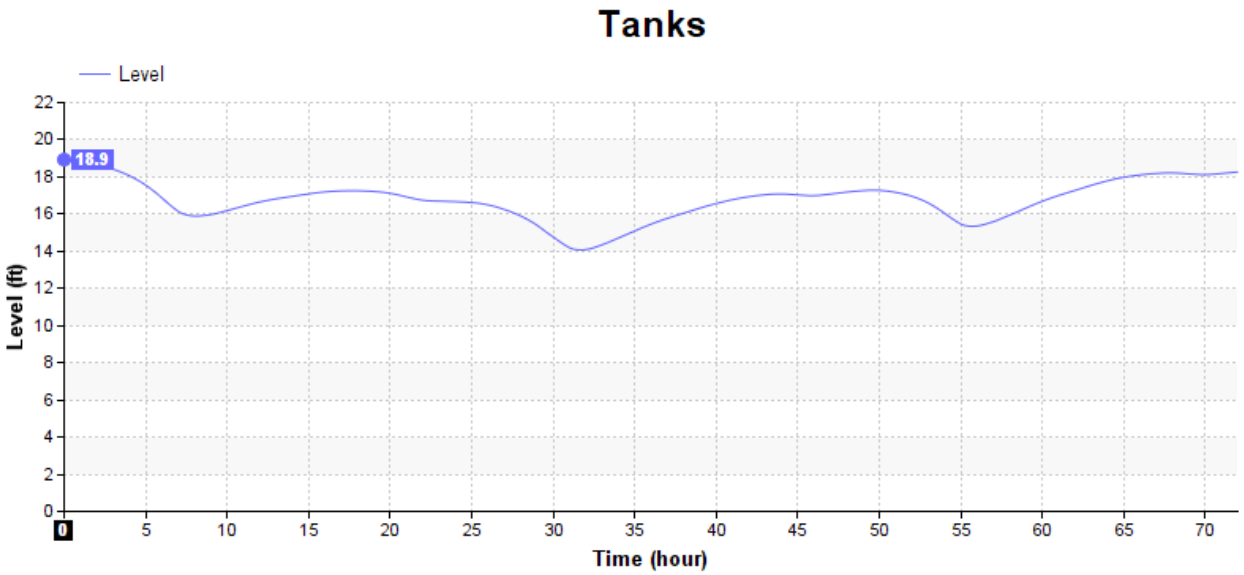
29485000

Oak Strt Well Report Midvale City

Month August Year 2019

Date	Time	Meter Reading	Pump Level	Static Level	Oil 6-8DPM	PSI	GPM	Remarks	By
1	9:17	2066171	263		✓	95.6	662.77	1545	RG
2	8:13	2067087	264		✓	94.5	822.75	1620	RG
3	9:10	2066814	264		✓	95.5	744.66	1614	CH
4	6:11	2069011	265		✓	95.4	711.54	1575	CH
5	8:55	2070047	263		✓	95.5	772.29	1596	TF/Lab
6	8:20	2071018	264		✓	95.5	721.45	1581	ER/TF
7	8:42	2071932	265		✓	95.6	717.85	1581 RPM	BS/RG
8	8:07	2072873	262		✓	955	736.62	1581	RG/LG
9	8:46	2073764	262		✓	95.5	663.72	1557	ER
10	7:45	2074595	265		✓	95.5	670.75	1566	JW
11	10:30	2075692	263		✓	95.4	809.2	1608	JW
12	8:32	2076750	262		✓	94.4	820.89	1620 RPM	BS
13	8:28	2077774	263		✓	95.5	658.54	1551 RPM	BS
14	8:30	2078703	262		✓	95.6	741.90	1605 RPM	BS/ER
15	8:04	2079619	262		✓	95.5	691.48	1566	RG
16	9:00	2080570	263		✓	95.5	738.47	1587	ER/BS
17	9:46	2081508	260		✓	95.5	596.00	1527	RG
18	11:54	2082503	259		✓	95.5	495.08	1500	RG
19	7:25	2083264	262		✓	95.5	824.50	1620	TF LR
20	7:30	2084142	262		✓	95.2	811.16	1620	RG/BS
21	7:37	2085151	263		✓	94.6	818.11	1620 RPM	BS/RG
22	7:35	2086118	266		✓	95.5	816.00	1620	MP/TF
23	7:39	2087043	262		✓	94.5	818.87	1620 RPM	BS
24	9:15	2088110	261		✓	95.6	587.76	1530 RPM	BS
25	9:16	2089032	262		✓	95.5	649.56	1548 RPM	BS
26	7:42	2089880	263		✓	94.0	822.95	1620 RPM	BS
27	7:45	2090871	264		✓	95.5	743.99	1587	TF
28	7:51	2091782	263		✓	94.2	831.56	1620 RPM	BS/AA
29	7:57	2092711	262		✓	95.6	589.85	1533 RPM	AA
30	9:26	262 2093584	264		✓	95.5	642.00	1554	MC
31	8:05	2094315	260		✓	95.5	526.48	1509 RPM	MC

Existing Model Output



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APPENDIX D
Unit Costs

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AVERAGE WATER PIPE COST PER FOOT

Diameter (in)	Diameter (ft)	Outside Diameter (ft)	Pipe Material & Installation (1)	Excavation	Imported Bedding Installed	Hauling Excess Native Mat'l	Trench Backfill Installed (3)	Trench Box per Day (2)	Average Daily Output	Trench Box Cost	Top Trench Width (ft)	Road Repair Width (ft)	Asphalt Cost	Service Lateral Cost	Fire Hydrant Cost	Valves & Fittings Cost	Pipeline Connection Costs	Conflicts (9)	Trench Dewatering (4)	Total Cost per Foot of Pipe	Adjusted Cost per foot	Cost Out of Street (3)	Diameter (in)
4	0.3	0.39	26.00	2.84	9.61	1.20	3.83	210.00	400	0.53	2.99	6.99	28.94	18.11	2.37	0.34	1.20	0.00	8.48	103	90	77	4
6	0.5	0.58	30.50	3.17	11.19	1.43	4.11	210.00	333	0.63	3.18	7.18	29.59	18.11	2.37	0.46	1.36	0.00	9.51	112	98	86	6
8	0.7	0.78	48.00	3.52	12.81	1.68	4.40	210.00	200	1.05	3.38	7.38	30.25	18.11	2.37	0.72	1.53	0.00	12.27	137	119	109	8
10	0.8	0.97	61.50	3.88	14.45	1.95	4.69	210.00	182	1.15	3.57	7.57	30.91	18.11	2.37	1.13	2.23	0.00	13.31	156	136	128	10
12	1.0	1.17	67.00	4.26	16.14	2.24	4.98	210.00	160	1.31	3.77	7.77	31.57	18.11	2.37	0.73	2.94	0.00	14.63	166	145	138	12
14	1.2	1.36	71.00	4.65	17.86	2.55	5.27	210.00	133	1.58	3.96	7.96	32.23	18.11	2.37	1.27	3.22	0.00	16.52	177	154	148	14
16	1.3	1.56	77.00	5.07	19.61	2.88	5.56	210.00	114	1.84	4.16	8.16	32.89	18.11	2.37	1.63	3.52	9.44	18.42	198	173	159	16
18	1.5	1.75	86.50	5.50	21.40	3.23	5.84	210.00	100	2.10	4.35	8.35	33.55	18.11	2.37	2.04	3.80	10.24	20.32	215	187	175	18
20	1.7	1.94	93.00	5.95	23.23	3.60	6.13	210.00	89	2.36	4.54	8.54	34.21	18.11	2.37	2.65	4.10	10.90	22.21	229	200	188	20
24	2.0	2.33	112.00	6.89	26.99	4.41	6.71	210.00	77	2.73	4.93	8.93	35.52	18.11	2.37	4.10	4.68	12.48	25.14	262	229	218	24
30	2.5	2.92	139.50	8.44	32.90	5.76	7.57	210.00	70	3.00	5.52	9.52	37.50	18.11	2.37	5.99	5.54	14.73	27.99	309	270	262	30
36	3.0	3.50	167.00	10.14	39.12	7.29	8.44	210.00	65	3.23	6.10	10.10	39.48	18.11	2.37	8.93	6.40	17.06	30.62	358	312	307	36

Reference: 2018 RS Means Heavy Construction Cost Data Updated by: JKN

Costs:

$ 20.85	/CY Native Trench backfill - sec. 31 23 23.16 (0200): Fill by borrow [sand, dead or bank x 1.21 O&P] w/o materials (27.94-18.6) and convert from loose to compacted volume. $11.20/LCY * 1.39 LCY/ECY (see Note 5)
$ 59.08	/CY Imported Select Fill - sec. 31 23 23.16 (0200), 31 23 23.20 (4266), 31 23 23.23 (8050): Sand, dead or bank w/ hauling and compaction. ($33.50/LCY + $5.10/LCY)*1.39 LCY/ECY + $5.50/ECY (see Note 5)
$ 6.10	/CY Excavation - sec. 31 23 16.13 (6372): 10-14 ft deep, 1 CY excavator, Trench Box.
$ 30.49	/SY 4" Asphalt Pavement - sec. 32 11 23.23 (0390), 31 23 23.20 (4268), 32 12 16.13 (0120), 32 12 16.13 (0380): 9" Bank Run GravelBase Course ($7.10/SY), 2" Binder ($9.30/SY), 2" Wear ($10.40/SY [4"=$19.80/SY]) and Hauling [Item 4268] ($7.35/LCY * 1.39LCY/ECY * 0.361CY/SY) (see Note 5)
$ 2.63	/LF 4" Asphalt cutting - sec. 02 41 19.25 (0015, 0020): Saw cutting asphalt up to 3" deep ($1.68/LF), each additional inch of depth ($0.95/LF)
$ 1,811.32	/EA Service Lateral Connection (see Note 7)
$ 4,734.51	/EA Fire hydrant assembly including excavation and backfill (see Note 8)
$ 7.16	/CY Hauling - sec. 31 23 23.20 (4262): 20 CY dump truck, 6 mile round trip and conversion from loose to compacted volume. $4.13/LCY * 1.39 LCY/ECY (see Note 5)
$ 210.00	/day Trench Box - sec. 31 52 16.10 (4500): 7' deep, 16' x 8'
$ 63.32	/CY Stabilization Gravel - sec. 31 23 23.16 (0050), 31 23 23.20 (4266), 31 23 23.23 (8050): Bank Run Gravel ($36.50/LCY * 1.39 LCY/ECY) plus compaction ($5.50/ECY) and hauling ($5.10/LCY * 1.39 LCY/ECY) (see Note 5)
$ 1,152.00	/day Dewatering - sec. 31 23 19.20 (1000, 1020): 4" diaphram pump, 8 hrs attended ($1,025/day). Second pump ($127/day)

NOTES:

(1) Assumes: class 50, 18' lengths, tyton push-on joint for DIP (33 11 13.15 3000-3180); Pressure Pipe class 150, SDR 18, AWWA C900 for PVC <14" & AWWA C905, PR 100, DR 25 for 14" and larger (33 11 13.25 4520-4550 3030-3200); butt fusion joints SDR 21, 40' lengths for HDPE ().
DIP and HDPE costs only go up to 24". PVC costs only go up to 48". All costs for pipe larger than 48" are Prestressed Concrete pipe (PCCP), 150 psi, 24' length (Pg 315).

(2) 7' deep trench box (16' x 8') - on page 263

(3) Backfill Material & Installation assumes in street. For out of street unit costs, the backfill material cost has been added in place of base course and asphalt.

(4) Dewatering assumes 1' stabilization gravel at the bottom of the trench plus dewatering pumps

(5) Conversion from loose to compacted volumes assumes 125 PCF for compacted density and 90 PCF for loose density. Or (125 PCF/ECY)/(90 PCF/LCY) = 1.39 LCY/ECY

(6) Conversion from cubic yards to square yards for hauling of asphalt paving assumed a total thickness of 13". 3 ft x 3 ft x (13 in)/(12 in/ft) = 0.361 CY/SY

(7) Service Lateral costs are based on Beaver Dam short and long service connections average ($1,660.98/connection), with 45.40 for curb replacement, 40.20 for sidewalk replacement, and 158.19 for additional asphalt all added to the short service connection. Used historical cost index to update to current dollars.

(8) Fire Hydrant assembly costs are based on Beaver Dam Water Projects plus 45.40 for curb replacement and 158.19 for additional asphalt ($4341.55 per FH). Used historical cost index to update to current dollars.

(9) Conflicts amounted to be 2% of the cost on the Springville 400 South Pipeline project. Use 5% of total cost per ft.

(10) Joint Restraint has NOT been included in this spreadsheet.

Abbreviations:

VLF	vertical lineal foot
PCF	pounds per cubic foot
LCY	loose cubic yard
ECY	embankment cubic yard

Utah City Cost Indices

SLC	88.5
Ogden	85.8
Logan	87
Price	85
Provo	87.2

APPENDIX E
Available Fire Flow (Existing System)

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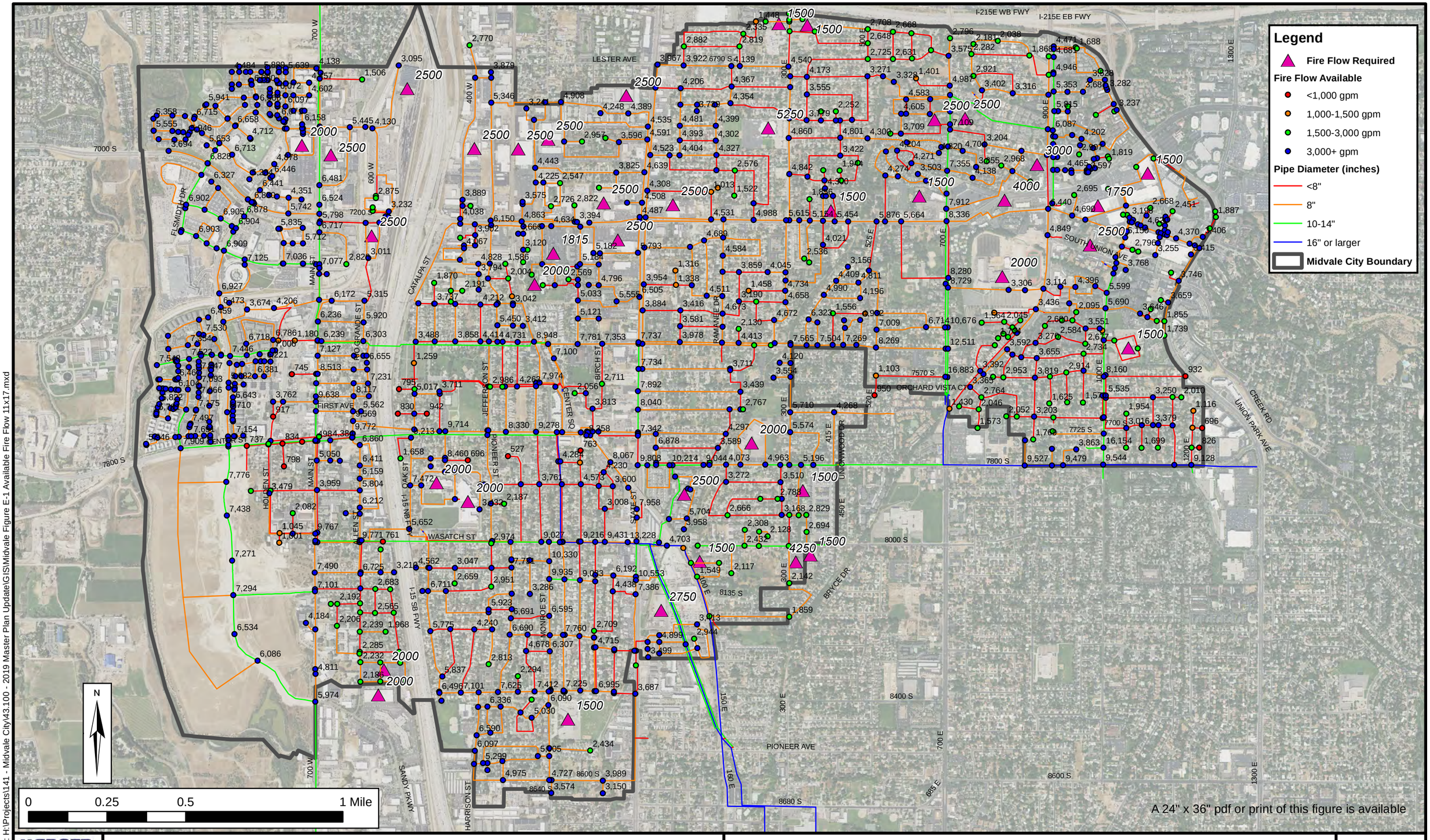

Date: 5/5/2020
Document Path: H:\Projects\141 - Midvale City\43.100 - 2019 Master Plan Update\GIS\Midvale Figure E-1 Available Fire Flow 11x17.mxd

HANSEN ALLEN & LUCE inc ENGINEERS

MIDVALE CITY DRINKING WATER SYSTEM

EXISTING SYSTEM AVAILABLE FIRE FLOW

FIGURE
E-1

APPENDIX F
InfoWater Hydraulic Models (Compact disc)

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APPENDIX G
Checklist for Hydraulic Model Design Elements Report

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CHECKLIST FOR HYDRAULIC MODEL DESIGN ELEMENTS REPORT

The hydraulic model checklist below identifies the components included in the Hydraulic Model Design Elements Report for

Midvale City Drinking Water Master Plan
(Project Name or Description)

1093
(Water System Number)

Midvale City Public Water System
(Water System Name)

April 24, 2020
(Date)

The checkmarks and/or P.E. initials after each item indicate the conditions supporting P.E. Certification of this Report.

1. The Report contains:

   (a) A listing of sources including: the source name, the source type (i.e., well, spring, reservoir, stream etc.) for both existing sources and additional sources identified as needed for system expansion, the minimum reliable flow of the source in gallons per minute, the status of the water right and the flow capacity of the water right. *[R309-110-4 "Master Plan" definition]* ☒ KJ

   (b) A listing of storage facilities including: the storage tank name, the type of material (i.e., steel, concrete etc.), the diameter, the total volume in gallons, and the elevation of the overflow, the lowest level (elevation) of the equalization volume, the fire suppression volume, and the emergency volume or the outlet. *[R309-110-4 "Master Plan" definition]* ☒ KJ

   (c) A listing of pump stations including: the pump station name and the pumping capacity in gallons per minute. Under this requirement one does not need to list well pump stations as they are provided in requirement (a) above. *[R309-110-4 "Master Plan" definition]* ☒ KJ

   (d) A listing of the various pipeline sizes within the distribution system with their associated pipe materials and, if readily available, the approximate length of pipe in each size and material category. A schematic of the distribution piping showing node points, elevations, length and size of lines, pressure zones, demands, and coefficients used for the hydraulic analysis required by (h) below will suffice. *[R309-110-4 "Master Plan" definition]* ☒ KJ

(e) A listing by customer type (i.e., single family residence, 40 unit condominium complex, elementary school, junior high school, high school, hospital, post office, industry, commercial etc.) along with an assessment of their associated number of ERCs. *[R309-110-4 "Master Plan" definition]* ☒ KJ

(f) The number of connections along with their associated ERC value that the public drinking water system is committed to serve, but has not yet physically connected to the infrastructure. *[R309-110-4 "Master Plan" definition]* ☒ KJ

(g) A description of the nature and extent of the area currently served by the water system and a plan of action to control addition of new service connections or expansion of the public drinking water system to serve new development(s). The plan shall include current number of service connections and water usage as well as land use projections and forecasts of future water usage. *[R309-110-4 "Master Plan" definition]* ☒ KJ

(h) A hydraulic analysis of the existing distribution system along with any proposed distribution system expansion identified in (g) above. *[R309-110-4 "Master Plan" definition]* ☒ KJ

(i) A description of potential alternatives to manage system growth, including interconnections with other existing public drinking water systems, developer responsibilities and requirements, water rights issues, source and storage capacity issues and distribution issues. *[R309-110-4 "Master Plan" definition]* ☒ KJ

2. At least 80% of the total pipe lengths in the distribution system affected by the proposed project are included in the model. *[R309-511-5(1)]* ☒ KJ

3. 100% of the flow in the distribution system affected by the proposed project is included in the model. If customer usage in the system is metered, water demand allocations in the model account for at least 80% of the flow delivered by the distribution system affected by the proposed project. *[R309-511-5(2)]* ☒ KJ

4. All 8-inch diameter and larger pipes are included in the model. Pipes smaller than 8-inch diameter are also included if they connect pressure zones, storage facilities, major demand areas, pumps, and control valves, or if they are known or expected to be significant conveyers of water such as fire suppression demand. *[R309-511-5(3)]* ☒ KJ

5. All pipes serving areas at higher elevations, dead ends, remote areas of a distribution system, and areas with known under-sized pipelines are included in the model. *[R309-511-5(4)]* ☒ KJ

6. All storage facilities and accompanying controls or settings applied to govern the open/closed status of the facility for standard operations are included in the model. *[R309-511-5(5)]* ☒ KJ

7. Any applicable pump stations, drivers (constant or variable speed), and accompanying controls and settings applied to govern their on/off/speed status for various operating conditions and drivers are included in the model. *[R309-511-5(6)]* ☒ KJ

8. Any control valves or other system features that could significantly affect the flow of water through the distribution system (i.e. interconnections with other systems, pressure reducing valves between pressure zones) for various operating conditions are included in the model. *[R309-511-5(7)]* ☒ KJ

9. Imposed peak day and peak instantaneous demands to the water system's facilities are included in the model. The Hydraulic Model Design Elements Report explains which of the Rule-recognized standards for peak day and peak instantaneous demands are implemented in the model (i.e., (i) peak day and peak instantaneous demand values per *R309-510, Minimum Sizing Requirements*, (ii) reduced peak day and peak instantaneous demand values approved by the Director per *R309-510-5, Reduction of Sizing Requirements*, or (iii) peak day and peak instantaneous demand values expected by the water system in excess of the values in *R309-510, Minimum Sizing Requirements*). The Hydraulic Model Design Elements Report explains the multiple model simulations to account for the varying water demand conditions, or it clearly explains why such simulations are not included in the model. The Hydraulic Model Design Elements Report explains the extended period simulations in the model needed to evaluate changes in operating conditions over time, or it clearly explains (e.g., in the context of the water system, the extent of anticipated fire event, or the nature of the new expansion) why such simulations are not included in the model. *[R309-511-5(8) & R309-511-6(1)(b)]* ☒ KJ

10. The hydraulic model incorporates the appropriate demand requirements as specified in *R309-510, Minimum Sizing Requirements*, and *R309-511, Hydraulic Modeling Requirements*, in the evaluation of various operating conditions of the public drinking water system. The Report includes:
    - the methodology used for calculating demand and allocating it to the model;
    - a summary of pipe length by diameter;
    - a hydraulic schematic of the distribution piping showing pressure zones, general pipe connectivity between facilities and pressure zones, storage, elevation, and sources; and
    - a list or ranges of values of friction coefficient used in the hydraulic model according to pipe material and condition in the system. In accordance with

Rule stipulation, all coefficients of friction used in the hydraulic analysis are consistent with standard practices.
[R309-511-7(4)] ☒ KJ

11. The Hydraulic Model Design Elements Report documents the calibration methodology used for the hydraulic model and quantitative summary of the calibration results (i.e., comparison tables or graphs). The hydraulic model is sufficiently accurate to represent conditions likely to be experienced in the water delivery system. The model is calibrated to adequately represent the actual field conditions using field measurements and observations. *[R309-511-4(2)(b), R309-511-5(9), R309-511-6(1)(e) & R309-511-7(7)]* ☒ KJ

12. The Hydraulic Model Design Elements Report includes a statement regarding whether fire hydrants exist within the system. Where fire hydrants are connected to the distribution system, the model incorporates required fire suppression flow standards. The statement that appears in the Report also identifies the local fire authority's name, address, and contact information, as well as the standards for fire flow and duration explicitly adopted from *R309-510-9(4), Fireflow*, or alternatively established by the local fire suppression agency, pursuant to *R309-510-9(4), Fireflow.* The Hydraulic Model Design Elements Report explains if a steady-state model was deemed sufficient for residential fire suppression demand, or acknowledges that significant fire suppression demand warrants extended model simulations and explains the run time used in the simulations for the period of the anticipated fire event. *[R309-511-5(10) & R309-511-7(5)]* ☒ KJ

13. If the public drinking water system provides water for outdoor use, the Report describes the criteria used to estimate this demand. If the irrigation demand map in *R309-510-7(3), Irrigation Use,* is not used, the report provides justification for the alternative demands used in the model. If the irrigation demands are based on the map in *R309-510-7(3), Irrigation Use,* the Report identifies the irrigation zone number, a statement and/or map of how the irrigated acreage is spatially distributed, and the total estimated irrigated acreage. The indicated irrigation demands are used in the model simulations in accordance with Rule stipulation. The model accounts for outdoor water use, such as irrigation, if the drinking water system supplies water for outdoor use. *[R309-511-5(11) & R309-511-7(1)]* ☒ KJ

14. The Report states the total number of connections served by the water system including existing connections and anticipated new connections served by the water system after completion of the construction of the project. *[R309-511-7(2)]* ☒ KJ

15. The Report states the total number of equivalent residential connections (ERC) including both existing connections as well as anticipated new connections associated with the project. In accordance with Rule stipulation, the number of ERC's includes high as well as low volume water users. In accordance with Rule

stipulation, the determination of the equivalent residential connections is based on flow requirements using the anticipated demand as outlined in *R309-510, Minimum Sizing Requirements*, or is based on alternative sources of information that are deemed acceptable by the Director. *[R309-511-7(3)]* ☒ KJ

16. The Report identifies the locations of the lowest pressures within the distribution system, and areas identified by the hydraulic model as not meeting each scenario of the minimum pressure requirements in *R309-105-9, Minimum Water Pressure*. *[R309-511-7(6)]* ☒ KJ

17. The Hydraulic Model Design Elements Report identifies the hydraulic modeling method, and if computer software was used, the Report identifies the software name and version used. *[R309-511-6(1)(f)]* ☒ KJ

18. For community water system models, the community water system management has been provided with a copy of input and output data for the hydraulic model with the simulation that shows the worst case results in terms of water system pressure and flow. *[R309-511-6(2)(c)]* ☒ KJ

19. The hydraulic model predicts that new construction will not result in any service connection within the new expansion area not meeting the minimum distribution system pressures as specified in *R309-105-9, Minimum Water Pressure. [R309-511-6(1)(c)]* ☒ KJ

20. The hydraulic model predicts that new construction will not decrease the pressures within the existing water system such that the minimum pressures as specified in *R309-105-9, Minimum Water Pressure* are not met. *[R309-511-6(1)(d)]* ☒ KJ

21. The velocities in the model are not excessive and are within industry standards. ☒ KJ

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Appendix D

Ordinance Adopting the Jordan Valley Water Conservancy District's Water Efficiency Standards

Exhibit A – Ordinance

MIDVALE CITY

ORDINANCE NO. 2024-O-12

AN ORDINANCE CREATING CHAPTER 17-6 OF THE MIDVALE CITY MUNICIPAL CODE AND ENACTING THE JORDAN VALLEY WATER CONSERVANCY DISTRICT'S WATER EFFICIENCY STANDARDS.

WHEREAS, pursuant to Utah Code Annotated Sections 10-8-84 and 10-9a-501 through 10-9a-503, Midvale City ("the City") has authority to make and amend any regulation of or within zoning districts or any other provision of the land use ordinance to promote the prosperity, improve the morals, peace and good order, comfort, convenience, and aesthetics of the municipality; and

WHEREAS, on January 2, 2002, the Midvale City Zoning Ordinance, Title 17 of the Midvale City Municipal Code (the "Code"), became effective and is subject to amendments from time to time pursuant to Section 17-3-1 the Code; and

WHEREAS, pursuant to Section 17-1-1 of the Code, the City desires to promote coordinated development, redevelopment, effective use of land, and site planning; protect and promote public safety, health, and general welfare by providing adequate light and air, water and sewage control, police, fire and wetlands protection; and secure economy in governmental expenditures; and

WHEREAS, the City desires to create Chapter 17-6 to add supplementary regulations that have a general applicability across multiple zones; and

WHEREAS, the City desires to implement water conservation standards for the benefit of the City, its residents, and the State; and

WHEREAS, Utah Code Ann. § 73-10-37 and Utah Administrative Code R653-11 also require the City to adopt Jordan Valley Water Conservancy District's (JVWCD) Water Efficiency Standards in order for its residents to be eligible for landscaping conversion incentives; and

WHEREAS, the City wants its residents to eligible for landscaping conversion incentives; and

WHEREAS, the JVWCD Water Efficiency Standards have general applicability across multiple zones; and

WHEREAS, the Planning Commission held a public hearing on April 10, 2024, to review the request for text amendments and, after considering all the information received, made a recommendation to approve the text amendments to the City Council; and

WHEREAS, the City Council of Midvale City, Utah held a public hearing on April 16, 2024; and

WHEREAS, after taking into consideration citizen testimony, planning analysis, and the Planning Commission's recommendation as part of its deliberations, the City Council finds it is appropriate and within the best interest of the City to enact Chapter 17-6 to provide supplementary regulations that have a general applicability across multiple zones and to adopt JVWCD's Water Efficiency Standards .

NOW, THEREFORE, BE IT ORDAINED by the City Council of Midvale City, Utah, as follows:

Section 1. The following chapter of the Midvale City Municipal Code is hereby enacted as included in the following attachment:

- Attachment A: Chapter 17-6 Supplementary Regulations

Section 2. A violation of this ordinance includes the possibility of fines or imprisonment. Midvale City is required, under Utah Code Annotated Section 78B-22-301, to provide for indigent legal defense, as that term is defined in Utah Code Annotated Section 78B-22-102.

Section 3. This ordinance is effective upon publication in accordance with Utah Code Annotated Section 10-3-711.

PASSED AND APPROVED this 7th day of May, 2024.

Marcus Stevenson, Mayor

SEAL

MIDVALE CITY STATE OF UTAH INCORPORATED JULY 1, 1909 CORPORATE SEAL

Voting by City Council	"Aye"	"Nay"
Bonnie Billings	✓	
Paul Glover	✓	
Heidi Robinson	✓	
Bryant Brown	✓	
Dustin Gettel	✓	

ATTEST:

Rori L. Andreason, MMC
City Recorder

Published this 8th day of May, 2024, on the Utah Public Notice Website.

Attachment A: Chapter 17-6 Supplementary Regulations

Chapter 17-6
Supplementary Regulations

Sections

17-6-1 Applicability of this Chapter

The intent of this section is to provide for miscellaneous land development standards which are applicable in Title 17. An individual is required to follow all applicable standards under Title 17. When a conflict exists between these supplementary regulations in Chapter 17-6 and an individual zone, the standards of the individual zone shall supersede these supplementary regulations unless otherwise stated.

17-6-2 Water Conservation Standards

All new landscaping in all zones in the City shall conform with the Jordan Valley Water Conservancy District Water Efficiency Standards as published on the District's website (jvwcd.org). This requirement shall supersede individual zone requirements notwithstanding Section 17-6-1.

JVWCD Water Efficiency Standards

WATER EFFICIENCY STANDARDS

1. Purpose
   The purpose of these Water Efficiency Standards is to conserve the public's water resources by establishing water conservation standards for indoor plumbing fixtures and outdoor landscaping.

2. Applicability
   The following standards shall be required for all developer/contractor installed residential, commercial, institutional, and industrial construction, as applicable. The Outdoor Landscaping Standards shall also be required for new landscaping construction installed by homeowners.

3. Indoor Fixture Requirements
   It is recommended and encouraged, but not mandated, that all new and future construction and future additions, remodels, or refurbishments install plumbing fixtures that have the WaterSense label, including: lavatory faucets, shower heads, sink faucets, water closets (tank and flushometer-valve toilets), and urinals, to the extent Utah law allows municipalities or local districts to require these fixtures.

4. Outdoor Landscaping Standards
   All new and rehabilitated landscaping for public agency projects, private development projects, developer-installed landscaping in multi-family and single-family residential projects within the front and side yards, and homeowner provided landscape improvements within the front and side yards of single and two-family dwellings shall comply with the landscaping standards below:

   Definitions

   A. Activity Zones: Portions of the landscape designed for recreation or function, such as storage areas, fire pits, vegetable gardens, and playgrounds.

   B. Active Recreation Areas: Areas of the landscape dedicated to active play where Lawn may be used as the playing surface (ex. sports fields and play areas).

   C. Central Open Shape: An unobstructed area that functions as the focal point of Localscapes and is designed in a shape that is geometric in nature.

   D. Gathering Areas: Portions of the landscape that are dedicated to congregating, such as patios, gazebos, decks, and other seating areas.

   E. Hardscape: Durable landscape materials, such as concrete, wood, pavers, stone, or compacted inorganic mulch.

F. Lawn: Ground that is covered with grass or turf that is regularly mowed.

G. Localscapes®: A landscaping approach designed to create locally adapted and sustainable landscapes through a basic 5-step approach (central open shape, gathering areas, activity zones, connecting pathways, and planting beds).

H. Mulch: Any material such as rock, bark, compost, wood chips or other materials left loose and applied to the soil.

I. Park Strip: A typically narrow landscaped area located between the back-of-curb and sidewalk.

J. Paths: Designed routes between landscape areas and features.

K. Planting Bed: Areas of the landscape that consist of plants, such as trees, ornamental grasses, shrubs, perennials, and other regionally appropriate plants.

L. Total Landscaped Area: Improved areas of the property that incorporate all of the completed features of the landscape. The landscape area does not include footprints of buildings or structures, sidewalks, driveways, and other non-irrigated areas intentionally left undeveloped.

5. Landscaping Requirements

A. All irrigation shall be appropriate for the designated plant material to achieve the highest water efficiency. Drip irrigation or bubblers shall be used except in Lawn areas. Drip irrigation systems shall be equipped with a pressure regulator, filter, flush-end assembly, and any other appropriate components.

B. Each irrigation valve shall irrigate landscaping with similar site, slope and soil conditions, and plant materials with similar watering needs. Lawn and Planting Beds shall be irrigated on separate irrigation valves. In addition, drip emitters and sprinklers shall be placed on separate irrigation valves.

C. Landscaped areas shall be provided with a WaterSense labeled smart irrigation controller which automatically adjusts the frequency and/or duration of irrigation events in response to changing weather conditions. All controllers shall be equipped with automatic rain delay or rain shut-off capabilities.

D. At least 3-4 inches of Mulch, permeable to air and water, shall be used in Planting Beds to control weeds and improve the appearance of the landscaping.

E. At maturity, landscapes are recommended to have enough plant material (perennials and shrubs) to create at least 50% living plant cover at maturity at the ground plane, not including tree canopies.

F. Lawn shall not be installed in Park Strips, Paths, or on slopes greater than 25% or 4:1 grade, and be less than 8 feet wide at its narrowest point. To the extent reasonably practicable, Lawn shall be free from obstructions (trees, signs, posts, valve boxes, etc.).

G. In residential landscapes, the landscaping shall adhere to the following Localscapes requirements:

   i. If size permits, the landscaped areas of the front yard and back yard shall include a designed Central Open Shape created by using Lawn, Hardscape, groundcover, gravel, or Mulch.
   ii. Gathering Areas shall be constructed of Hardscape and placed outside of the Central Open Shape. In a landscape without Lawn, Gathering Areas may function as the Central Open Shape.
   iii. Activity Zones shall be located outside of the Central Open Shape and shall be surfaced with materials other than Lawn.
   iv. Paths shall be made with materials that do not include Lawn, such as Hardscape, Mulch, or other groundcover.
   v. Lawn areas shall not exceed the greater of 250 square feet, or 35% of the Total Landscaped Area.
   vi. Small residential lots, which have no back yards, which the Total Landscaped Area is less than 250 square feet, and which the front yard dimensions cannot accommodate the minimum 8 feet wide Lawn area requirement of the Landscaping Requirements in section F, are exempt from the 8 feet minimum width Lawn area requirement.

H. In commercial, industrial, institutional, and multi-family development common area landscapes, Lawn areas shall not exceed 20% of the Total Landscaped Area, outside of Active Recreation Areas.

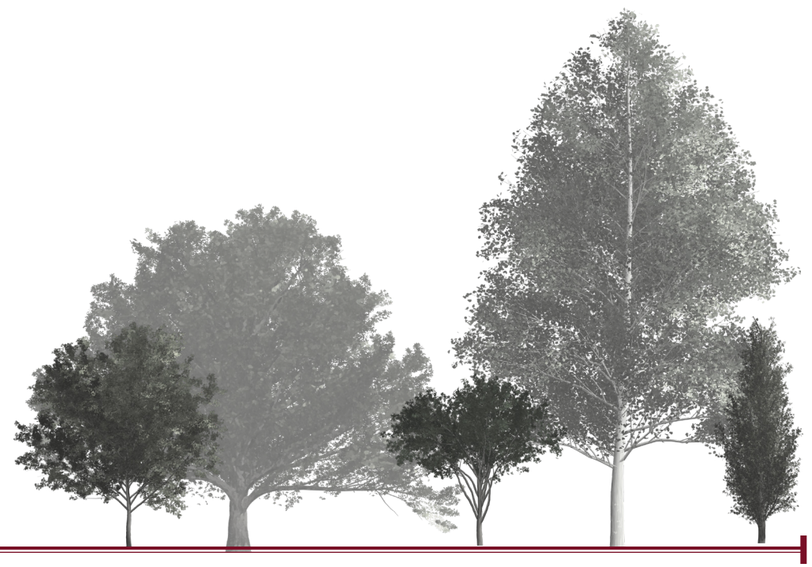
I. Certain special purpose landscape areas (e.g. stormwater management areas, etc.) may receive exceptions from the slope limitations and other elements of the Landscaping Requirements (see Paragraph F, above). Applications to receive exceptions are to be considered on a case-by-case basis.

J. These outdoor standards are not intended to be in conflict with other landscaping requirements as defined by Utah law, including stormwater retention requirements and low-impact development guidelines. Notwithstanding these outdoor standards, whenever any requirement may be in conflict with Utah law, such conflicting requirements shall not apply.

Appendix E

Street Tree Selection Guide

Midvale, Utah
Street Tree Selection Guide



Document issued January 2025

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01

Introduction

Overview

This document serves as a comprehensive resource for Midvale City staff, residents, developers, business owners, and other stakeholders, providing essential guidance on the selection, placement, and care of trees that are both attractive and suitable for Midvale's streetscape. The guidelines and standards outlined herein are designed to foster the development of a thriving, resilient, and diverse street tree canopy that significantly enhances the city's ecological, aesthetic, and social value. By following these recommendations, all members of the community can contribute to the creation of a greener, more vibrant Midvale.

MHTN ARCHITECTS

02

General Tree Guidelines

General Notes

- **This section provides practical guides for tree placement, planting, irrigation, and maintenance that ensures urban forestry success while minimizing conflicts with infrastructure.**

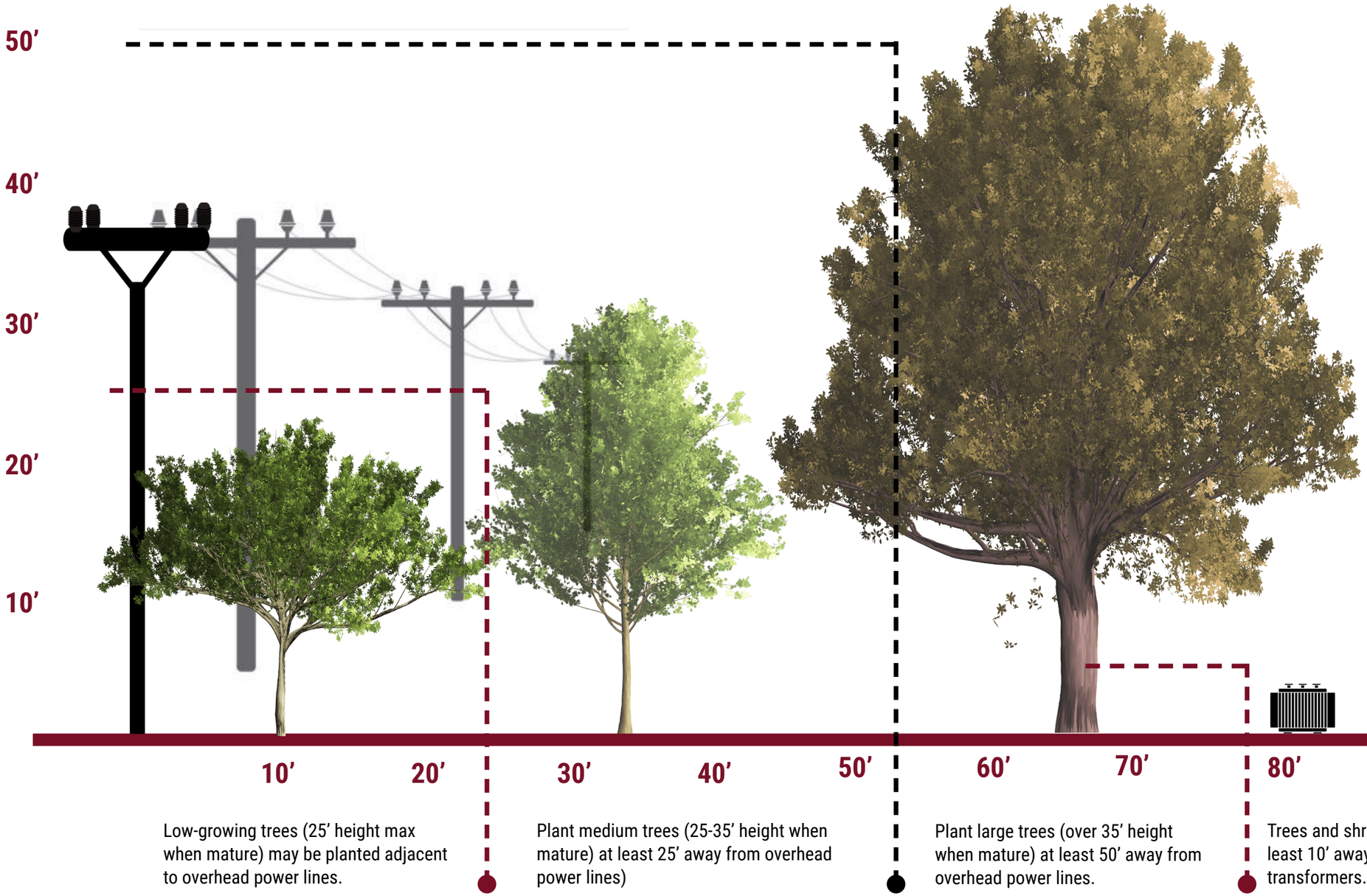
- **This information serves as a general guideline for tree placement, selection, and care. Specific requirements and solutions should be determined on a project-by-project basis, taking into account site conditions, local regulations, and expert input. Always consult with a qualified professional for detailed project planning implementation.**

Best Design Practices

General guidelines for successful integration of trees into the urban landscape

Planting Near Power Lines

Tips for planting trees near power lines to reduce the need for future pruning



Low-growing trees (25’ height max when mature) may be planted adjacent to overhead power lines.

Plant medium trees (25-35’ height when mature) at least 25’ away from overhead power lines)

Plant large trees (over 35’ height when mature) at least 50’ away from overhead power lines.

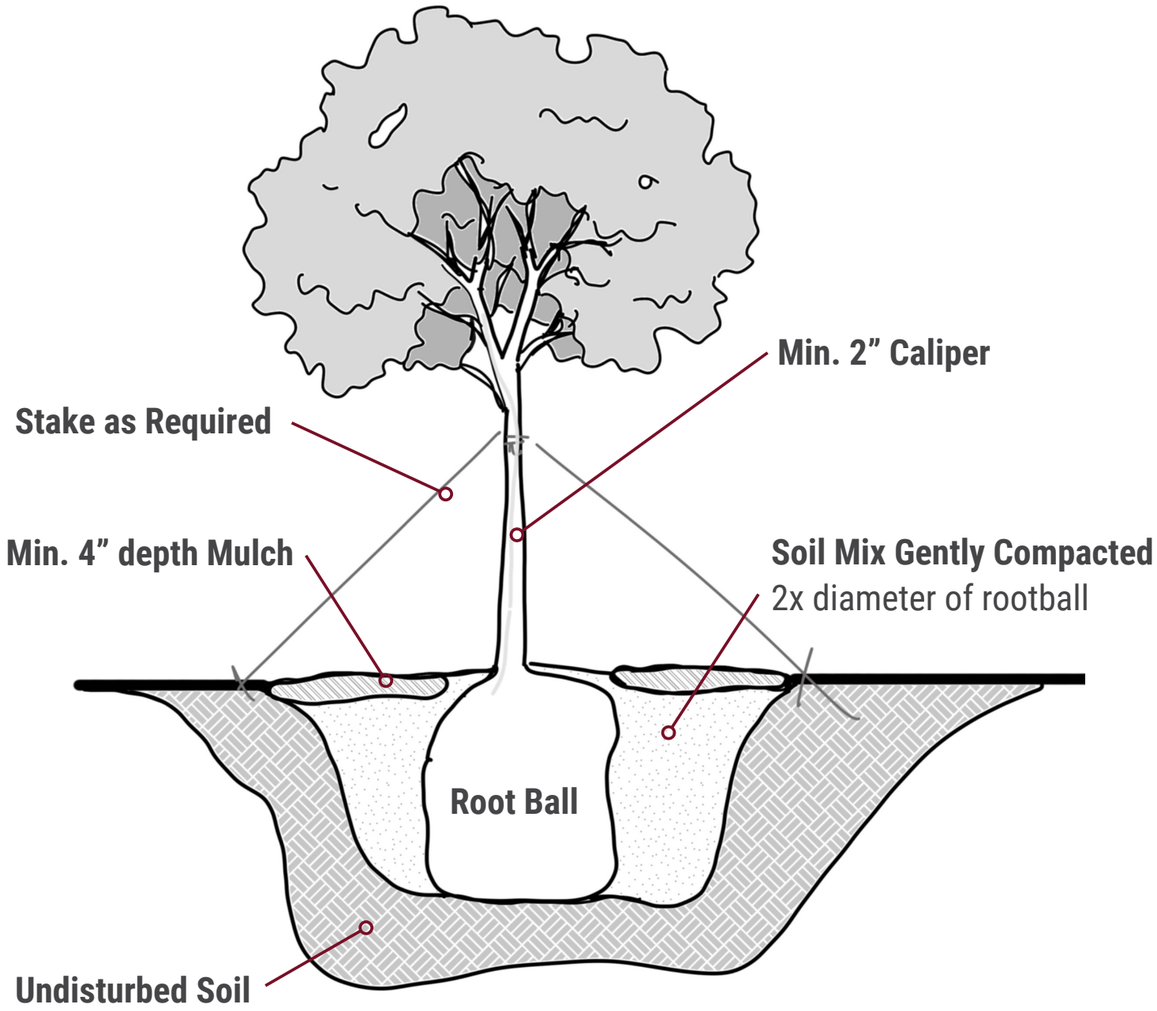
Trees and shrubs should be planted at least 10’ away from ground-mounted transformers.

Tree Establishment and Care

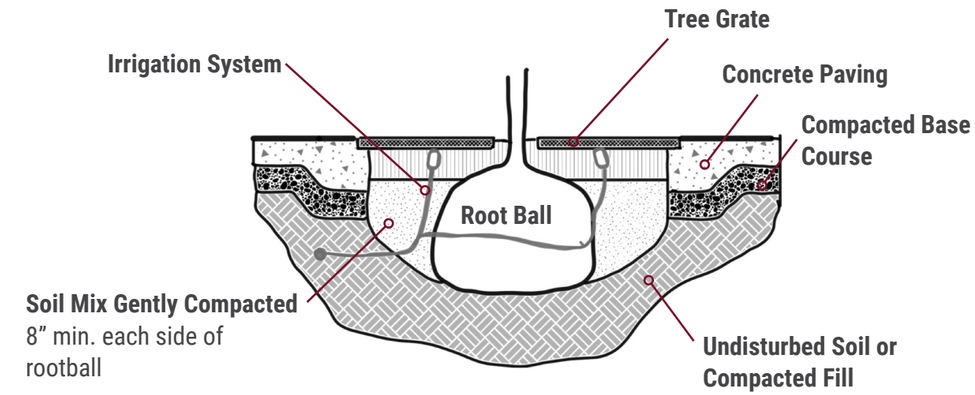
General criteria for successful integration of trees into the urban landscape

INSTALLATION AND PLANTING

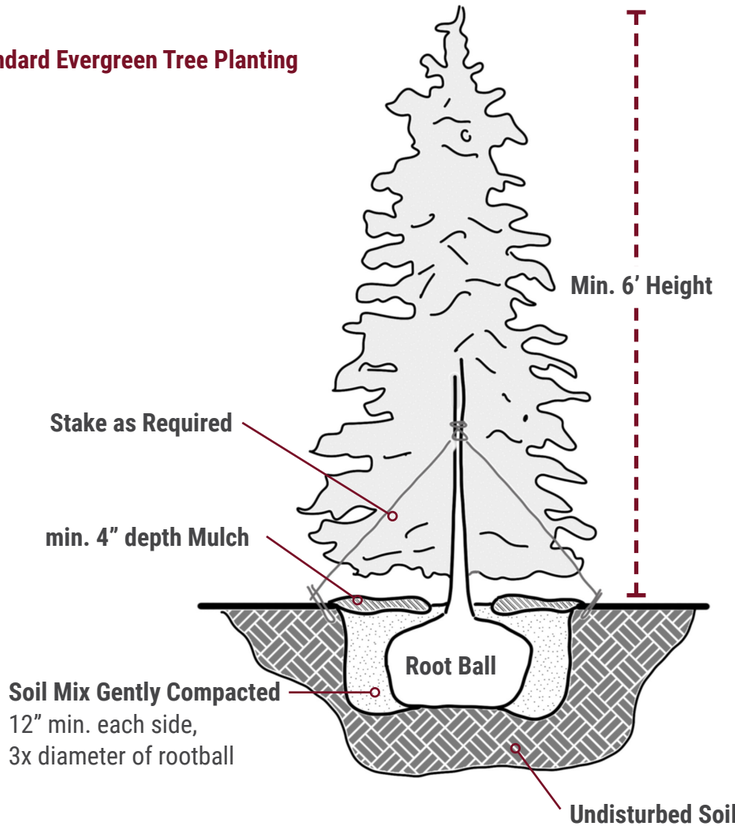
Standard Deciduous Tree Planting



Planting in Tree Grate



Standard Evergreen Tree Planting



TRIMMING AND PRUNING

Municipal Requirements

- Usually responsibility falls to city maintenance crews for public trees and property owners for private trees.

Best Practices

- For shade trees, leave enough clearance for people and vehicles to pass under.
- Help the tree establish a single leader.
- Remove dead, diseased, or damaged branches.
- Thin out dense growth to allow light, air, and rain to reach the interior of the tree.
- Remove V-shaped crotches as these can be a safety hazard and threaten the tree's health.

PESTS AND DISEASE

Best Practices

- Maintain tree health and resistance with proper watering and pruning, applying treatments as needed, and using integrated pest management (IPM) techniques to minimize chemical use.
- While some trees can get some of these pests and other diseases, they are not always fatal or threatening to the overall health of the tree. Asses the overall condition of the tree, or consult an arborist before seeking chemical treatment.
- Pests and disease to keep an eye out for in Midvale are:

Aphids

Borer

Powdery Mildew

Spider Mites

Anthracnose

STREET TREES

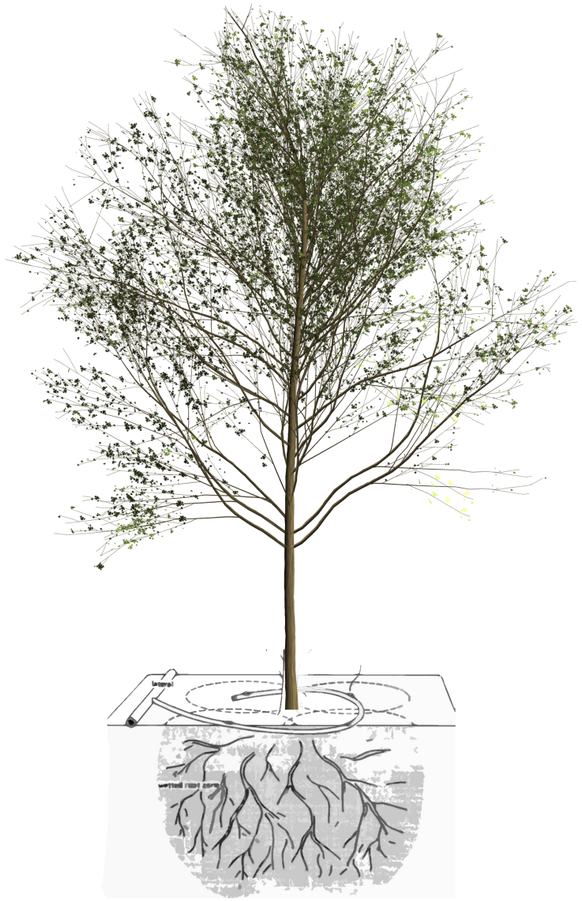
Municipal Requirements.

- Street tree species shall be selected according to the conditions of the park strip size shown in tables.
- A certified arborist may recommend species to be approved by the city on a per-project basis.

IRRIGATION AND WATER EFFICIENCY

Municipal Irrigation Standards Summary

- **Tree Irrigation: Provide drop emitters or bubblers for each tree; bubblers should not exceed 1.5 gallons per min.**
- Zone separation: Trees in turf areas should have separate irrigation zones for efficient water use.
- Runoff Control: On slopes, use low-precipitation systems like drip emitters to reduce runoff and improve water absorption.
- Detailed Plans: Include tree-specific irrigation needs in landscape plans, such as emitter placement and flow rates, to ensure proper watering.



03

Recommended Species

General Notes

- **This section outlines the recommended tree species selection for urban and street planting based on planter size, site conditions, and tree character.**
- **Some species listed include specific recommended cultivars chosen for their urban adaptability, size control, and growth habits, which may vary significantly in size compared to the species average. Always verify cultivar-specific details with local nurseries or arborists to confirm suitability for intended site.**
- **Disclaimer* Tree growth and success depends on local conditions such as soil type, irrigation, and climate. Prior to selection, confirm planter dimensions and space for root systems, compatibility with utility clearance requirements, and environmental factors.**

Small Palette (3-5’ Park Strip Size)

- Suitable for constrained spaces such as narrow parking strips.
- Mostly includes species that grow under 25’ height and spread, with non-invasive root systems.
- Should also be used in typical park strips where utility barriers exist.

Typical Palette (5-8’ Park Strip Size)

- Appropriate for most urban settings and park strips
- Trees from small palette may also be used where infrastructure/utility/ environmental barriers exist. Large palette trees may be used where viable.

Large Palette (8’+ Park Strip Size)

- Best suited for streets that have ample room for root and canopy expansion, as well as parks and open spaces.
- Many of these species are especially effective for providing shade to hot urban environments.

List of Recommended Species - Small Trees

Park Strip Size	Tree Species			Mature Tree Size		Shape	Water Use	Under Powerlines	Spacing	Special Considerations	Pg. #
	Botanical	Common	Cultivars	Height	Spread						
Small (3-5')	Acer ginnala	Amur Maple	Ginnala 'Flame'	15-20'	15-20'	round spreading	low-med	Yes	15-20'	Known for fiery red fall color and adaptability. It is the most drought tolerant of the maple varieties. Tree should only be pruned in the summer after the leaves have fully developed for the season. Can develop chlorosis in alkaline soils. Ideal for residential areas.	13
	Acer glabrum	Rocky Mountain Maple	NA	20-25'	15'-20'	upright oval	low		20-30'	Native to Utah, has great drought tolerance.	
	Acer griseum	Paperbark Maple	NA	20-25'	15-20'	upright oval	med		20-25'	Needs a protected site; does not transplant well when bare-rooted. Unique peeling bark. Requires rich, well-drained soils, not highly drought-tolerant.	
	Acer grandidentatum	Bigtooth Maple	Rocky Mt. Glow, Mesa Glow, Highand Park	20-30'	20-30'	oval to round	low-med	No	20-30'	Native to Utah, well adapted to local climate.	14
	Acer tataricum	Tatarian Maple	Hot Wings, Pattern Perfect, Rugged Charm	15-25'	15-25'	oval to round		Yes	15-20'	Resilient to harsh urban environments. Watch for occasional aphids or leaf scorch during drought.	
	Amelanchier laevis	Allegheny Serviceberry	NA	20-25'	15-25'	oval to round	med		15-25'	Ideal for sites with good drainage, avoid compacted soils. Susceptible to powdery mildew in humid or crowded environments. Monitor for fire blight and rust.	
	Amelanchier x grandiflora	Autumn Brilliance Serviceberry	Autumn Brilliance	15-25'	15-25'	broad oval to round			15-25'	See above. Not as drought-tolerant as some species; supplemental water may be needed during dry spells.	15
	Cercis canadensis	Eastern Redbud	Alba, Forest Pansy, Ruby Falls	15-25'	20-30'	irregular			20-25'	Tolerant of partial shade, protected site needed. Alba cultivar features white flowers. Forest pansy cultivar has purple leaves that are susceptible to leaf scorch in full sun.	
	Cornus mas	Cornelia Cherry Dogwood	Golden Glory	15-20'	15-20'	low branched/round	low-med		15-20'	Exfoliating bark, best used as a multi-stem, low-maintenance and pest-resistant.	
	Crataegus crus-galli var. inermis	Thornless Cockspur Hawthorn	Thornless Cockspur	20-30'	25-30'	round spreading		No	15-20'	var. inermis lacks thorns. Tolerates wide range of soils with good drainage, light shade and some drought, and many urban pollutants. Like most Hawthorns, these are susceptible to some pests and diseases such has Cedar-Hawthorn Rust. Pruning is best done in dormant season.	16
	Crataegus laevigata	English Hawthorn	Crimson Cloud	20-25'	15-20'	broad round	med	Yes	15-20'	Moderate drought tolerance. Prefers moist, well-drained soils. Crimson cloud cultivar is resistant to rust but prone to fire blight. Requires occasional pruning of crossing branches.	
	Crataegus x mordenensis	Morden Hawthorn	Toba	15-20'	15-20'	upright spreading			15-20'	Has sharp thorns. Best pruned in late winter once threat of extreme cold has passed.	
	Malus spp.	Adirondack Crabapple	NA	10-18'	8-12'	upright vase	med	Yes	10-12'	Upright form ideal for narrow spaces. Slower growing than other malus spp., known for good disease resistance and heavy white flowering.	17
		Prairifire Crabapple		15-20'	15-25'	round			15-20'	Attractive deep pink flowers and dark red fruit, one of the most popular of crabapples known for its striking beauty. Semi disease resistant	
		Spring Snow Crabapple		20-25'	15-25'	round			20-25'	More cold tolerant than other malus spp. Fruitless cultivar with white flowers, especially low maintenance. Note that it has scab susceptibility.	
	Quercus robur x alba	Streetspire Oak	Streetspire 'JFS-KW1QX'	40-45'	12-18'	Columnar	med	No	15-20'	Best powdery mildew resistance for more moist areas. Excellent street tree when pruned.	18
	Quercus x warei 'Nadler'	Kindred Spirit Oak	Kindred Spirit 'Nadler'	35-40'	8-12'	narrow coumnar	med		10-15'	Good mildew resistance, and is a sister seedling to 'regal prince', but is more tight and narrow and slower growing.	
	Syringa reticulata	Japanese Tree Lilac	Ivory Silk	20-25'	15-20'	upright oval/round	low-med	Yes	15-20'	Attracts hummingbirds and butterflies, flowering, fragrant. Form makes for excellent street tree use.	
	Tilia cordata	Littleleaf Linden	Summer Sprite	18-20'	12-15'	dense pyramidal	med		15-20'	Summer sprite cultivar is necessary for small park strip size and planting under powerlines, and is ideal for confined spaces due to minimal canopy spread.	19
	Zelkova serrata	Japanese Zelkova	City Sprite	25-30'	15-20'	compact oval to vase		No	20-25'	Compact, upright growth ideal for narrow park strips without vertical restrictions. Minimal pruning needed.	
			Wireless	20-24'	30-35'	flat topped broad spreading		Yes	25-35'	Broad, low canopy design especially ideal under utility lines. Ideal for shade without vertical growth. May require more space to account for horizonal spread interference with infrastructure or streets.	

List of Recommended Species - Medium Trees

Park Strip Size	Tree Species			Mature Tree Size		Shape	Water Use	Under Powerlines	Spacing	Special Considerations	Pg. #
	Botanical	Common	Cultivars	Height	Spread						
Medium Typ. (5-8')	**TREES FROM SMALL PALETTE MAY ALSO BE USED IN (5-8') PARK STRIPS, ESP. WHERE POWERLINES, UTILITIES, AND NARROW CORRIDORS EXIST.**										
	Acer campestre	Hedge Maple	NA	25-35'	25-35'	oval/rounded, dense	low-med	No	25-35'	Compact and resistent	21
	Acer miyabei	Mayabe Maple	State Street	30-35'	30-35'	oval to round	low-med		30-35'	Hardy and pest resistent	
	Acer negundo 'sensation'	Sensation Boxelder	Sensation	30-45'	25-30'	upright oval	low-med		25-35'	Male cultivar eliminates seed prduction. Avoid planting in overly wet soils.	
	Aesculus x carnea	Red Horsechestnut	NA	30-40'	25-35'	oval to round	med		25-35'	Prefers well-drained soil	22
	Alnus glutinosa	European Alder		40-50'	20-40'	pyramidal	med-high		20-40'	Adapts to wet/poorly drained soils, fast growing and nitrogen fixing properties improves soil quality	
	Corylus colurna	Turkish Filbert		40-50'	20-30'	pyramidal to oval	med		20-30'	Highly rated street tree.	
	Crataegus ambigua	Russian Hawthorn		15-25'	15-20'	round	low-med	Yes	15-20'	Occasional spring thinning and summer trimming back suckers at base.	23
	Gleditsia triacanthos	Honeylocust	Shademaster, Skyline	25-50'	20-40'	pyramidal to round	low-med	No	20-40'	Provides filtered shade, avoid overplanting in areas with existing honeylocusts, fast growing. Skyline cultivar is most popular cultivar for its form at all stages of growth that provide good traffic clearance.	
	Koelreuteria paniculata	Goldenrain Tree	All	30-40'	30-40'	round	low-med		30-40'	May reseed aggressively in some regions. 'Fastigiata' cultivar is narrow and good for narrow street tree applications, but other forms are broad-spreading and are well suited for roadside plantings and broad interchanges.	
			Fastigiata	20-25'	8-10'	narrow upright	low-med		10-15'		
	Maclura pomifera	Osage Orange Maackia	White shield, wichita	30-35'	30-35'	upright spreading	low-med		30-45'	Use 'white shield' and 'wichita' male thornless and fruitless culticars to minimize maintenance. Extremely tough and drought-tolerant once established. They may require some pruning to maintain stree tree clearance.	24
	Malus spp.	Various Crabapple	Various	Varies	Varies	Varies	Varies	Yes	Varies	See small palette recommendations	
	Ostrya virginiana	American Hophornbeam	Autumn treasure	25-40'	20-30'	oval to round	med	No	20-30'	Prefers moist, well-drained soils. Sensitive to transplanting, tough once established. Compatible with streets and urban soils, but seddlings are variable and may have low-hanging branches so look to recommended cultivars for street tree use.	
	Phellodendron amurense	Amur Corktree	His Majesty, Eye Stopper	30-45'	30-60'	round, broad spreading	low-med		30-60'	Plant male cultivars to avoid messy fruit. Can grow to be quite large and may require more space in optimal conditions.	
	Prunus padus	European Birdcherry	Albertii, Summer glow, Merlot	30-40'	18-30'	pyramidal to round	med		18-30'	Avoid overly wet soils. Many cultivars are low-branched and wide, but more upright cultivars such as 'Albertii', and 'Merlot' are good for street tree application.	25
	Pyrus calleryana	Callery Pear	Chanticleer, Aristocrat	30-50'	20-35'	upright to round	med		20-35'	Tolerant of urban pollution and alkaline soils. Avoid overplanting due to weak branching in mature tree, some breakage is inevitable. Widely used as a small to medium street tree. 'Chanticleer' cultivar is strongly recommended, and 'Aristocrat' as second option where a broader form is desired.	
	Pyrus ussuriensis	Ussurian Pear	Bailfrost	20-30'	15-20'	oval to round	med		15-20'	Cold-hardy, urban-tolerant ornamental pear with less breakage than Pyrus calleryana. However, for use as a street tree requires more width and pruning in most locations. If available, 'Bailfrost' is narrower cultivar and better street tree.	
	Quercus robur f. fastigiata	Columnar English Oak	Columnaris 'Fastigiata'	50-60'	10-18'	columnar	med		10-18'	Columnaris has narrower form suitable for smaller spaces. Prefers well-drained soils and full sun. Use as a hedge or screening tree where wide branching is a concern.	26
	Quercus robur x bicolor	Regal Prince Oak	Regal Prince 'long'	40-45'	15-20'	narrow columnar	med		15-20'	Narrow and tolerant of many soil conditions, noted for having excellent resistance to powdery mildew and borers.	
	Quercus robur x Quercus alba	Crimson Spire Oak	Crimschmidt	40-45'	15-20'	Columnar	med		15-20'	Ideal for tight urban spaces. Has powdery mildew resistance for more moist areas, and is known for its strong growth.	
	Ulmus parvifolia	Lacebark Elm	Frontier	30-50'	20-30'	upright, vase to broad oval	low-med		20-30'	Upright, compact form for restrained urban corridors. 'Frontier' cultivar is a hybrid between U. minor and U. parvifolia.	27

Spreading | Columnar | Weeping | Round | Oval | Vase | Pyramidal

List of Recommended Species - Large Trees

Park Strip Size	Tree Species			Mature Tree Size		Shape	Water Use	Under Powerlines	Spacing	Special Considerations	Pg. #
	Botanical	Common	Cultivars	Height	Spread						
Large (8'+)	Ginkgo biloba	Ginkgo Tree	Autumn Gold, Princeton Sentry	40-55'	20-30'	pyramidal	low-med	No	20-30'	Known for its beauty and adaptability to all soils exept for constantly-wet soils. Male cultivars recommended to avoid messy fruit.	28
	Gymnocladus dioicus	Kentucky Coffeetree	Espresso, Prarie Titan	35-50'	15-25'	oval to upright	low-med		20-30'	Drought tolerant, pods may be messy. Growth habit makes for excellent street tree applications. These seedless cultivars give reliable shape and low maintenance.	
	Liquidambar styraciflua	American Sweetgum	Emerald Sentinel	25-60'	15-40'	pyramidal to round	med-high		15-40'	Requires well drained soils, prone to leaf spot and cankers. Best is open, sunny locations. Recommended cultivars for street tree use is 'Emeral Sentinel', and seed grown trees can be used along roadsides. Roots are among the worst for lifting concrete, so at least 8' planter strips are needed. Note than big size and spacing range includes all cultivar options, plant accordingly.	
	Liriodendron tulipifera	Tuliptree	Emerald City	50-55'	25-30'	pyramidal	med		25-30'	Fast growing. Prefers moist, deep, well-drained soils; susceptible to various pests. 'Emerald city' cultivar is the only one suitable for city-sized landscapes.	29
	Platanus x acerifolia	London Planetree	Exclamation	50-75'	35-50'	oval to round			35-50'	Highly resistent to urban pollution and pests, adaptable to most soils, but anthracnose is a concern. For street tree applications, give it root and crown space, and allow for a potential 5' trunk diameter. It is one of the best large canopy street trees.	
	Quercus bicolor	Swamp White Oak	NA	40-60'	35-45'	round			45-50'	Extremely drought tolerant once established, great choice for hot parking islands.	
	Quercus imbricaria	Shingle Oak		40-60'	35-50'	pyramidal to round	med		35-50'	Tolerates alkaline soils. Foliage persists throughout winter, which is subjectively desirable and undesirable.	30
	Quercus macrocarpa	Bur Oak	Urban Pinnacle	50-60'	40-50'	round	low-med		45-50'	Tolerates drought, poor soils, and urban environments. Urban pinnacle cultivar is narrow and ideal for tight spaces, and produces smaller acorns.	
	Quercus robur	English Oak	NA	50-70'	50-70'	round	med		70-75'	Tolerates various soils. Slow growing but long-lived. May require larger space due to wide canopy. Better suited for parks instead of street corridors. Narrow columnar hybrids are better suited for street tree use.	
	Tilia tomentosa	Silver Linden	Sterling Silver	60-65'	30-35'	broad pyramidal to oval			30-35'	Can be prone to aphid infestations, but is the most resistant of all lindens. Provides excellent shade and is an effective street tree where there is room for its large and broad form. The tomentose foliage gives it aphid resistance, as opposed to to other lindens that drip sticky aphid honeydew.	31
	Ulmus davidiana	David Elm	Greenstone 'JFS-KW2UD'	45-50'	35-40'	upright vase			40-45'	Greenstone cultivar is resistent to Dutch Elm disease and pests. Use where high overhead canopy is desired, as a shade tree, in parking lots and plazas.	
	Ulmus davidiana var. japonica	Accolade Elm	NA	50-60'	30-40'	vase			40-45'	Accolade cultivar is resistent to Dutch Elm disease and pests.	
	Ulmus 'New Horizon'	New Horizon Elm		35-45'	20-30'	upright vase			40-45'	New horizon cultivar is resistent to Dutch Elm disease and pests. Fast growing with narrow form. May be susceptible to elm leaf beetle.	32
	Ulmus 'Morton Glossy'	Triumph Elm		50-60'	40-50'	round to vase			50-55'	Triumph cultivar is resistent to Dutch Elm disease.	

Spreading | Columnar | Weeping | Round | Oval | Vase | Pyramidal

Small Park Strip Palette (3-5’)

Tree palette for 3-5’ parking strips and confined spaces with utility barriers

Botanical Name: : Acer ginnala

Common Name: : Amur Maple

Recommended Cultivars: ‘Flame’

Mature Size: 15-20’ height, 15-20’ spread

Water Needs: low-med,

Spacing: 15-20’

Special Considerations: Known for fiery red fall color and adaptability. It is the most drought tolerant of the maple varieties. Tree should only be pruned in the summer after the leaves have fully developed for the season. Can develop chlorosis in alkaline soils. Ideal for residential areas.

Botanical Name: : Acer glabrum

Common Name: : Rocky Mountain Maple

Recommended Cultivars: NA

Mature Size: 20-25’ height, 15-20’ spread

Water Needs: low

Spacing: 20-30’

Special Considerations: Native to Utah, has great drought tolerance but prefers filtered shade in the landscape.

Botanical Name: : Acer griseum

Common Name: : Paperbark Maple

Recommended Cultivars: NA

Mature Size: 20-25’ height, 15-20’ spread

Water Needs: med,

Spacing: 20-25’

Special Considerations: Needs a protected site; does not transplant well when bare-rooted. Unique peeling bark. Requires rich, well-drained soils, not highly drought-tolerant.

Botanical Name: : Acer grandidentatum

Common Name: : Bigtooth Maple

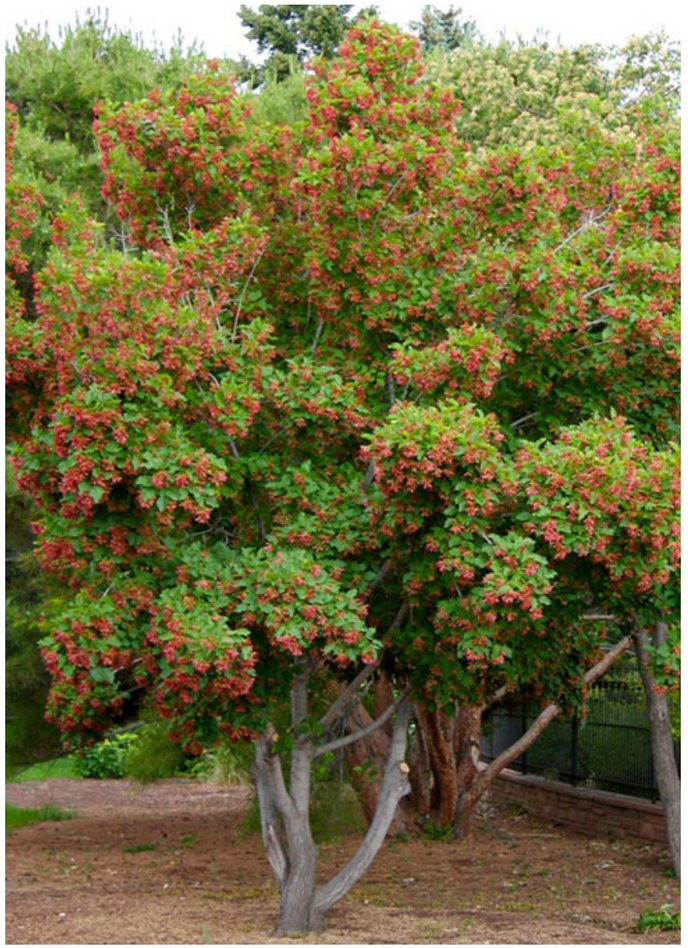
Recommended Cultivars: Rocky Mt. Glow, Mesa Glow, Highland Park

Mature Size: 20-30’ height, 20-30’ spread

Water Needs: low-med,

Spacing: 20-30’

Special Considerations: Native to Utah. In ideal conditions, may grow up to 40’ tall. Rocky Mt. Glow cultivar is shown above.



Botanical Name: : Acer tataricum

Common Name: : Tatarian Maple

Recommended Cultivars: Hot Wings, Pattern Perfect, Rugged Charm

Mature Size: 15-25’ height, 15-25’ spread

Water Needs: low-med,

Spacing: 15-20’

Special Considerations: Resilient to harsh urban environments. Watch for occasional aphids or leaf scorch during drought. Hot Wings cultivar is shown above.

Botanical Name: : Amelanchier laevis

Common Name: : Allegheny Serviceberry

Recommended Cultivars: NA

Mature Size: 20-25’ height, 15-25’ spread

Water Needs: med

Spacing: 15-25’

Special Considerations: Ideal for sites with good drainage, avoid compacted soils. Susceptible to powdery mildew in humid or crowded environments. Monitor for fire blight and rust.

Botanical Name: : Amelanchier x grandiflora

Common Name: : Autumn Brilliance Serviceberry

Recommended Cultivars: Autumn Brilliance

Mature Size: 20-25’ height, 15-25’ spread

Water Needs: med

Spacing: 15-25’

Special Considerations: Similar to Allegheny Serviceberry, not as drought-tolerant as some species; supplemental water may be needed during dry spells. Their berries are edible and resemble blueberries.

Botanical Name: : Cercis canadensis

Common Name: : Eastern Redbud

Recommended Cultivars: Alba, Forest Pansy

Mature Size: 15-25’ height, 25-30’ spread

Water Needs: med

Spacing: 20-25’

Special Considerations: Tolerant of partial shade, protected site needed. Alba cultivar features white flowers. Forest pansy cultivar has purple leaves that are susceptible to leaf scorch in full sun.

Botanical Name: : Cornus mas

Common Name: : Cornelia Cherry Dogwood

Recommended Cultivars: Golden glory

Mature Size: 15-20’ height, 15-20’ spread

Water Needs: low-med

Spacing: 15-20’

Special Considerations: Exfoliating bark, has multi-stem and tree form options, low-maintenance and pest-resistant.

Botanical Name: : Crataegus crus-galli var. inermis

Common Name: : Thornless Cockspur Hawthorn

Recommended Cultivars: Crusader

Mature Size: 20-30’ height, 25-30’ spread

Water Needs: low-med

Spacing: 15-20’

Special Considerations: Tolerates wide range of soils with good drainage, light shade and some drought, and many urban pollutants. Like most Hawthorns, these are susceptible to some pests and diseases such has Cedar-Hawthorn Rust. Pruning is best done in dormant season.

Botanical Name: : Crataegus laevigata

Common Name: : English Hawthorn

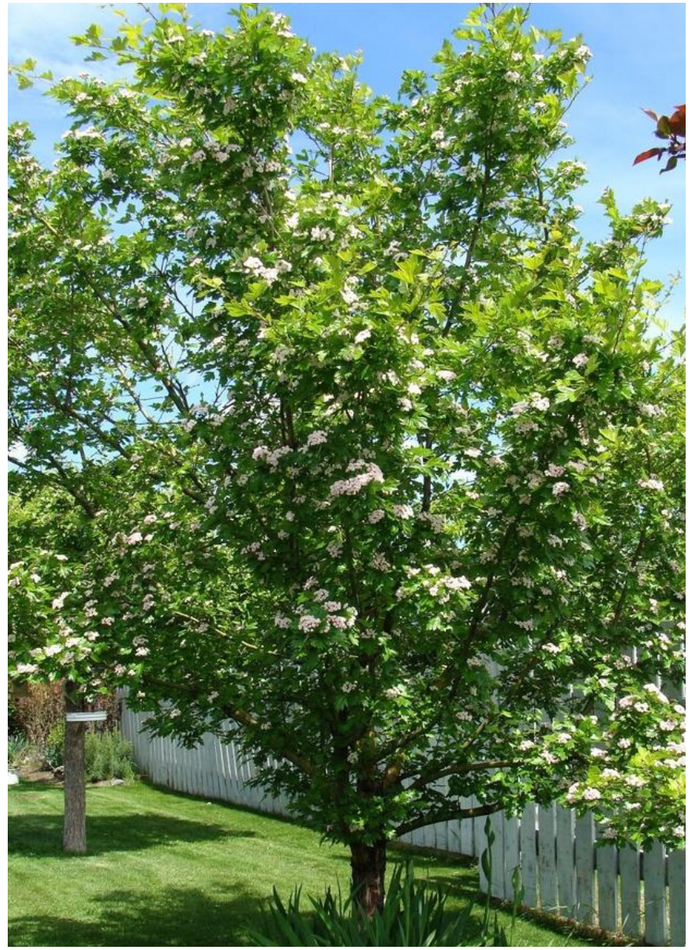
Recommended Cultivars: Crimson Cloud

Mature Size: 20-25’ height, 15-20’ spread

Water Needs: med

Spacing: 15-20’

Special Considerations: Moderate drought tolerance. Prefers moist, well-drained soils. Crimson cloud cultivar is resistant to rust but prone to fire blight. Requires occasional pruning of crossing branches. Shown above is Crimson Cloud cultivar.



Botanical Name: : Crataegus x mordenensis

Common Name: : Morden Hawthorn

Recommended Cultivars: Toba

Mature Size: 15-20’ height, 15-20’ spread

Water Needs: low-med

Spacing: 15-20’

Special Considerations: Has sharp thorns. Best pruned in late winter once threat of extreme cold has passed. Can be wide for street tree purpose, space around planting strip is necessary for wide spread.

Botanical Name: : Malus ‘Adirondack’

Common Name: : Adirondack Crabapple

Recommended Cultivars: Adirondack

Mature Size: 10-18’ height, 8-12’ spread

Water Needs: med

Spacing: 10-12’

Special Considerations: Resilient to harsh urban environments. Good option for narrow parkstrips or tighter spaces.

Botanical Name: : Malus x ‘Prariefire’

Common Name: : Prairifire Crabapple

Recommended Cultivars: Prairiefire

Mature Size: 15-20’ height, 15-25’ spread

Water Needs: med

Spacing: 15-20’

Special Considerations: Attractive deep pink flowers and dark red fruit, one of the most popular of crabapples known for its striking beauty. Semi disease resistant.

Botanical Name: : Malus x ‘Spring Snow’

Common Name: : Spring Snow Crabapple

Recommended Cultivars: Spring Snow

Mature Size: 20-25’ height, 15-25’ spread

Water Needs: med

Spacing: 15-25’

Special Considerations: More cold tolerant than other Malus spp. Spring Snow is Fruitless cultivar with white flowers, especially low maintenance.

Botanical Name: : Quercus robur x Quercus alba ‘JFS-KW1QX’

Common Name: : Streetspire English Oak

Recommended Cultivars: Streetspire ‘JFS-HW1QX’

Mature Size: 40-45” height, 15-20’ spread

Water Needs: med

Spacing: 15-20’

Special Considerations: Best powdery mildew resistance for more moist areas. Excellent street tree when pruned.

Botanical Name: : Quercus x warei ‘Nadler’

Common Name: : Kindrid Spirit Oak

Recommended Cultivars: Kindred Spirit ‘Nadler’

Mature Size: 30-40’ height, 8-12’ spread

Water Needs: med

Spacing: 10-15’

Special Considerations: Good mildew resistance, and is a sister seedling to ‘regal prince’, but is more tight and narrow and slower growing.

Botanical Name: : Syringa reticulata

Common Name: : Japanese Tree Lilac

Recommended Cultivars: Ivory Silk

Mature Size: 20-25’ height, 15-20’ spread

Water Needs: med

Spacing: 15-20’

Special Considerations: Attracts hummingbirds and butterflies, flowering, fragrant. Form makes for excellent street tree use.

Botanical Name: : Tilia cordata ‘Halka’

Common Name: : Littleleaf Linden

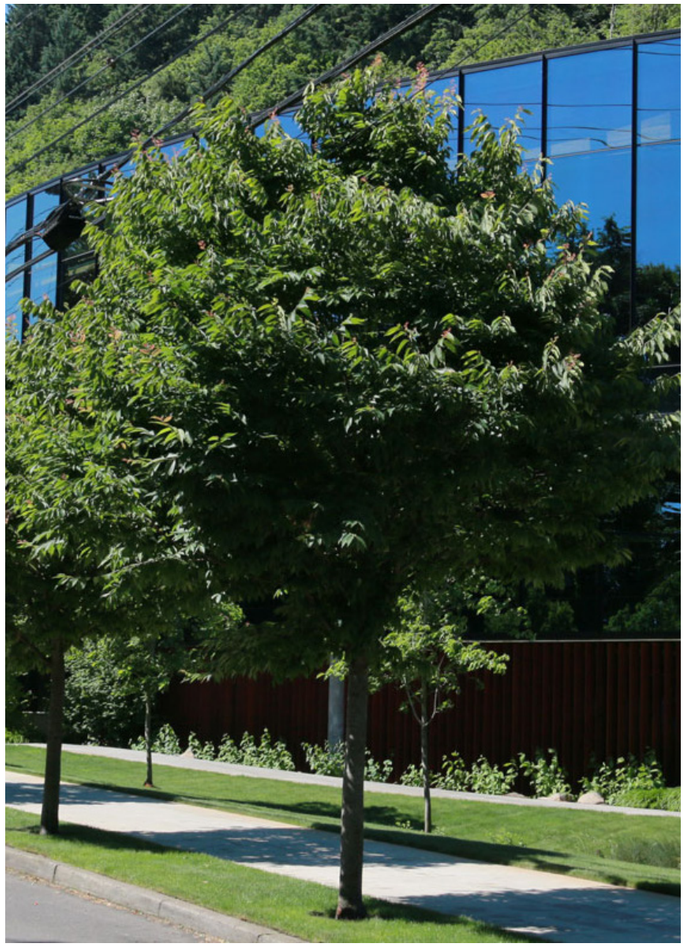
Recommended Cultivars: Summer Sprite

Mature Size: 18-20’ height, 12-15’ spread

Water Needs: low-med,

Spacing: 15-20’

Special Considerations: Summer sprite cultivar is excellent for small park strip size and planting under powerlines, and is ideal for confined spaces due to minimal canopy spread.



Botanical Name: : Zelkova serrata ‘City Sprite’

Common Name: : City Sprite Zelkova

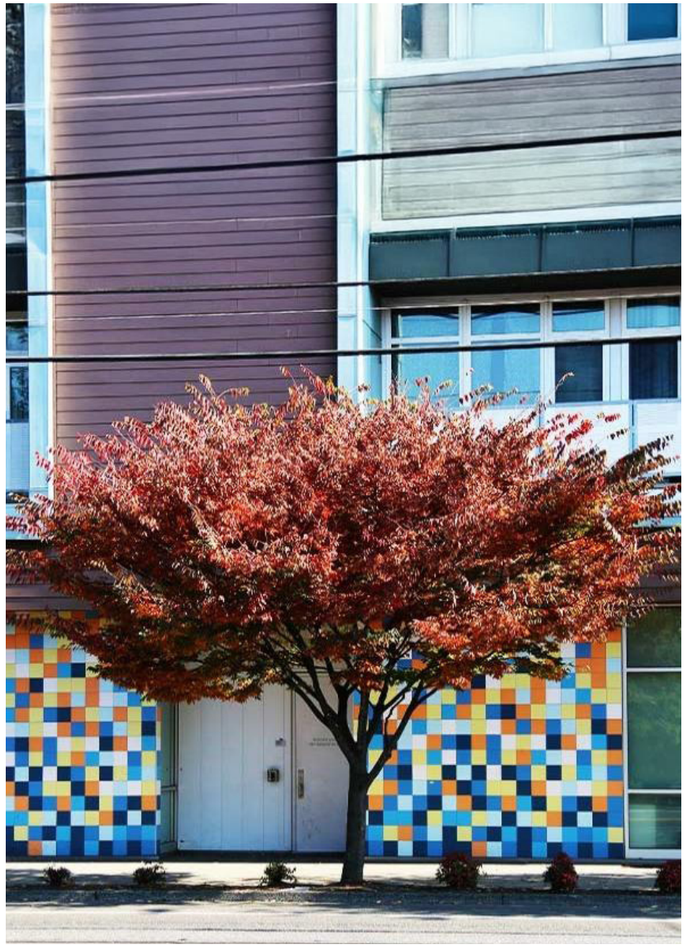
Recommended Cultivars: City Sprite ‘JFS-KW1’

Mature Size: 25-30’ height, 15-20’ spread

Water Needs: med

Spacing: 20-25”

Special Considerations: Compact, upright growth ideal for narrow park strips without vertical restrictions. Minimal pruning needed.



Botanical Name: : Zelkova serrata ‘Schmidtlow’

Common Name: : Wireless Zelkova

Recommended Cultivars: Wireless ‘JFS-KW1’

Mature Size: 20-24’ height, 30-35’ spread

Water Needs: med

Spacing: 35-35”

Special Considerations: Broad, low canopy design especially ideal under utility lines. Ideal for shade without vertical growth. May require more space to account for horizontal spread interference with infrastructure or streets.

Medium Park Strip Palette (5-8’)

Tree palette for 5-8’ parking strips and typical corridors

Botanical Name: : Acer campestre

Common Name: : Field/Hedge Maple

Recommended Cultivars: NA

Mature Size: 15-20’ height, 15-20’ spread

Water Needs: low-med,

Spacing: 15-20’

Special Considerations: It is the one of the more drought tolerant of the maple varieties. Tree should be pruned when young to develop a desirable shape.

Botanical Name: : Acer miyabei ‘Morton’

Common Name: : State Street Maple

Recommended Cultivars: State Street

Mature Size: 30-45’ height, 30-35’ spread

Water Needs: low-med,

Spacing: 25-35’

Special Considerations: Good tolerance to alkaline soils.

Botanical Name: : Acer negundo ‘sensation’

Common Name: : Sensation Boxelder

Recommended Cultivars: Sensation (must be this cultivar)

Mature Size: 30-45’ height, 25-30’ spread

Water Needs: low-med,

Spacing: 25-35’

Special Considerations: Must be Sensation cultivar, otherwise it is not permitted and can be invasive. This male cultivar eliminates seed production. Avoid planting in overly wet soils.

Botanical Name: : Aesculus x carnea

Common Name: : Red Horsechestnut

Recommended Cultivars: NA

Mature Size: 30-40’ height, 25-35’ spread

Water Needs: med

Spacing: 30-35’

Special Considerations: Prefers well-drained soil. In very hot summer conditions late season foliage burn is common.

Botanical Name: : Corylus colurna

Common Name: : Turkish Filbert

Recommended Cultivars: NA

Mature Size: 40-50’ height, 20-40’ spread

Water Needs: med

Spacing: 20-30’

Special Considerations: Highly rated street tree. Tolerates a wide variety of conditions including high soil pH and cold temperatures.

Botanical Name: : Crataegus viridis ‘Winter King’

Common Name: : Green Hawthorn

Recommended Cultivars: Winter King

Mature Size: 20-30’ height, 20-30’ spread

Water Needs: low-med

Spacing: 20-30’

Special Considerations: Hardy and adaptable, good winter interest, tolerates drought and urban pollution well. Good for areas with small landscape space but space for wide tree spread.

Botanical Name: : Gleditsia triancanthos

Common Name: : Honeylocust

Recommended Cultivars: Shademaster, Skyline

Mature Size: 20-50’ height, 20-40’ spread

Water Needs: low-med

Spacing: 20-40’

Special Considerations: . Provides filtered shade, avoid overplanting in areas with existing honeylocusts, fast growing. Skyline cultivar is most popular cultivar for its form at all stages of growth that provide good traffic clearance. It is a favored and excellent street tree.

Botanical Name: : Koelreuteria paniculata

Common Name: : Goldenrain Tree

Recommended Cultivars: All, Fastigiata

Mature Size: 15-20’ height, 15-20’ spread

Water Needs: low-med

Spacing: 15-20’

Special Considerations: May reseed aggressively in some regions. ‘Fastigiata’ cultivar is narrow and good for narrow street tree applications, but other forms are broad-spreading and are well suited for roadside plantings and broad interchanges.

Botanical Name: : Maclura pomifera

Common Name: :Osage Orange Maackia

Recommended Cultivars: White Shield, Wichita

Mature Size: 30-35’ height, 30-35’ spread

Water Needs: low-med

Spacing: 30-45’

Special Considerations: Use ‘White Shield’ and ‘Wichita’ male thornless and fruitless cultivars to minimize maintenance. Extremely tough and drought-tolerant once established. They may require some pruning to maintain street tree clearance.

Botanical Name: : Ostrya virginiana

Common Name: : American Hophornbeam

Recommended Cultivars: Autumn Treasure

Mature Size: 25-40’ height, 20-30’ spread

Water Needs: med

Spacing: 20-30’

Special Considerations: . Prefers moist, well-drained soils. Sensitive to transplanting, tough once established. Compatible with streets and urban soils, but seedlings are variable and may have low-hanging branches so look to recommended cultivars for street tree use.

Botanical Name: : Phellodendron amurense

Common Name: : Amur Corktree

Recommended Cultivars: His majesty, Eye Stopper

Mature Size: 30-45’ height, 30-60’ spread

Water Needs: low-med

Spacing: 30-60’

Special Considerations: Plant male cultivars to avoid messy fruit. Can grow to be quite large and may require more space in optimal conditions.

Botanical Name: :Prunus padus

Common Name: : European Birdcherry

Recommended Cultivars: Albertii, Merlot, Summer Glow

Mature Size: 3-40’ height, 18-30’ spread

Water Needs: low-med

Spacing: 18-30’

Special Considerations: Avoid overly wet soils. Many cultivars are low-branched and wide, but more upright cultivars such as ‘Albertii’, and ‘Merlot’ are good for street tree application.

Botanical Name: : Pyrus calleryana

Common Name: : Callery Pear

Recommended Cultivars: Chanticleer, Aristocrat, Respire

Mature Size: 30-40’ height, 20-35’ spread

Water Needs: med

Spacing: 20-35’

Special Considerations: . Prefers moist, well-drained soils. Sensitive to transplanting, tough once established. Compatible with streets and urban soils, but seedlings are variable and may have low-hanging branches so look to recommended cultivars for street tree use.

Botanical Name: : Pyrus ussuriensis

Common Name: : Ussurian Pear

Recommended Cultivars: Bailfrost

Mature Size: 20-30’ height, 15-20’ spread

Water Needs: med

Spacing: 15-20’

Special Considerations: Cold-hardy, urban-tolerant ornamental pear with less breakage than Pyrus calleryana. However, for use as a street tree requires more width and pruning in most locations. If available, ‘Bailfrost’ is narrower cultivar and better street tree.

Botanical Name: : Quercus robur ‘Fastigiata’

Common Name: Columnar English Oak

Recommended Cultivars: NA

Mature Size: 50-60’ height, 10-18’ spread

Water Needs: med

Spacing: 10-20’

Special Considerations: Columnaris has narrower form suitable for smaller spaces. Prefers well-drained soils and full sun. Use as a hedge or screening tree where wide branching is a concern.

Botanical Name: : Quercus robur x bicolor ‘Long Regal Prince’

Common Name: : Regal Prince Oak

Recommended Cultivars: Regal Prince

Mature Size: 40-45’ height, 15-20’ spread

Water Needs: med

Spacing: 15-20’

Special Considerations: Narrow and tolerant of many soil conditions, noted for having excellent resistance to powdery mildew and borers.

Botanical Name: : Quercus robur x alba ‘Crimschmidt’

Common Name: : Crimson Spire Oak

Recommended Cultivars: Crimschmidt

Mature Size: 40-45’ height, 15-20’ spread

Water Needs: med

Spacing: 15-20’

Special Considerations: . Ideal for tight urban spaces. Has powdery mildew resistance for more moist areas, and is known for its strong growth.

Botanical Name: :Ulmus parvifolia

Common Name: : Lacebark Elm

Recommended Cultivars: Frontier

Mature Size: 30-50’ height, 20-30’ spread

Water Needs: low-med

Spacing: 20-30’

Special Considerations: Upright, attractive compact form for restrained urban corridors. Is adaptable to a wide variety of sites.

Large Park Strip Palette (8'+)

Tree palette for large parking strips, open space, and parks

Botanical Name: : Ginkgo biloba

Common Name: : Ginkgo Tree

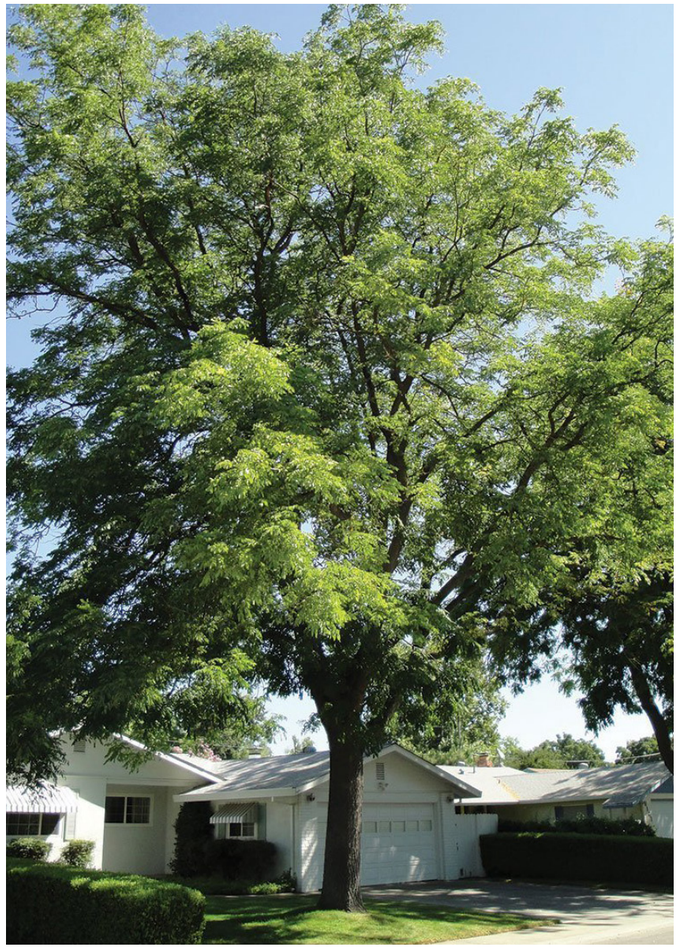
Recommended Cultivars: Autumn Gold, Princeton, Sentry

Mature Size: 40-55' height, 20-30' spread

Water Needs: low-med,

Spacing: 20-25'

Special Considerations: Known for its beauty and adaptability to all soils except for constantly-wet soils. Male cultivars recommended to avoid messy fruit.



Botanical Name: : Gymnocladus dioicus

Common Name: : Kentucky Coffeetree

Recommended Cultivars: Espresso, Prairie Titan

Mature Size: 35-50' height, 20-30' spread

Water Needs: low-med,

Spacing: 20-30'

Special Considerations: Drought tolerant, pods may be messy if seedless variety is selected. Growth habit makes for excellent street tree applications. The seedless cultivars give reliable shape and low maintenance.

Botanical Name: : Liquidambar styraciflua

Common Name: : American Sweetgum

Recommended Cultivars: Emerald Sentinel

Mature Size: 25-60' height, 15-40' spread

Water Needs: med-high

Spacing: 15-40'

Special Considerations: . Requires well drained soils, prone to leaf spot and cankers. Best is open, sunny locations. Recommended cultivars for street tree use is 'Emerald Sentinel'. Roots are among the worst for lifting concrete, so at least 8' planter strips are needed.

Botanical Name: : Liriodendron tulipifera

Common Name: : Tuliptree

Recommended Cultivars: Emerald City

Mature Size: 50-55’ height, 25-30’ spread

Water Needs: med

Spacing: 25-30’

Special Considerations: Fast growing. Prefers moist, deep, well-drained soils; susceptible to various pests. ‘Emerald city’ cultivar is the only one suitable for city-sized landscapes.

Botanical Name: : Platanus x acerfolia

Common Name: : London Planetree

Recommended Cultivars: Exclamation!

Mature Size: 50-70’ height, 35-50’ spread

Water Needs: med

Spacing: 35-50’

Special Considerations: Highly resistant to urban pollution and pests, adaptable to most soils, but anthracnose is a concern. For street tree applications, give it root and crown space, and allow for a potential 5’ trunk diameter. It is one of the best large canopy street trees but may need additional root space to prevent damage to surrounding pavement.

Botanical Name: : Quercus bicolor

Common Name: Swamp White Oak

Recommended Cultivars: NA

Mature Size: 40-60’ height, 35-45’ spread

Water Needs: med

Spacing: 45-50’

Special Considerations: . Extremely drought tolerant once established, great choice for hot parking islands.

Botanical Name: : Quercus imbricaria

Common Name: : Shingle Oak

Recommended Cultivars: NA

Mature Size: 40-60’ height, 35-50’ spread

Water Needs: med

Spacing: 45-50’

Special Considerations: Tolerates alkaline soils. Foliage persists throughout winter, which is subjectively desirable and undesirable.

Botanical Name: : Quercus macrocarpa

Common Name: : Bur Oak

Recommended Cultivars: Urban Pinnacle

Mature Size: 50-60’ height, 40-50’ spread

Water Needs: low-med

Spacing: 45-55’

Special Considerations: Tolerates drought, poor soils, and urban environments. Urban pinnacle cultivar is narrow and ideal for tight spaces, and produces smaller acorns.

Botanical Name: : Quercus robur

Common Name: :English Oak

Recommended Cultivars: See table

Mature Size: 50-70’ height, 50-70’ spread

Water Needs: med

Spacing: 70-75’

Special Considerations: Tolerates various soils. Slow growing but long-lived. May require larger space due to wide canopy. Better suited for parks instead of street corridors. Narrow columnar hybrids are better suited for street tree use.

Botanical Name: : Tilia tomentosa

Common Name: : Silver Linden

Recommended Cultivars: Sterling Silver

Mature Size: 60-65’ height, 30-35’ spread

Water Needs: med

Spacing: 30-35’

Special Considerations: Can be prone to aphid infestations, but is the most resistant of all lindens. Provides excellent shade and is an effective street tree where there is room for its large and broad form. Has a wonderful, sweet smell in June.

Botanical Name: : Ulmus davidiana

Common Name: : David Elm

Recommended Cultivars: Greenstone ‘JFS-KW2UD’

Mature Size: 40-50’ height, 35-40’ spread

Water Needs: med

Spacing: 40-45’

Special Considerations: Greenstone cultivar is resistant to Dutch Elm disease and pests. Use where high overhead canopy is desired, as a shade tree, in parking lots and plazas.

Botanical Name: : Ulmus davidiana var. japonica

Common Name: : Accolade Elm

Recommended Cultivars: Accolade

Mature Size: 45-50’ height, 35-40’ spread

Water Needs: med

Spacing: 40-45’

Special Considerations: . Accolade cultivar is resistant to Dutch Elm disease and pests. Long-lived and tolerant of drought and poor soils

Botanical Name: : Ulmus ‘Morton Glossy’

Common Name: : Triumph Elm

Recommended Cultivars: Triumph ‘Morton Glossy’

Mature Size: 50-60’ height, 40-50’ spread

Water Needs: med

Spacing: 50-55’

Special Considerations: Triumph cultivar is resistant to Dutch Elm disease. It is the one of the most popular Elms and is usually easy to find in the nursery trade.

Botanical Name: : Ulmus ‘New Horizon’

Common Name: : New Horizon Elm

Recommended Cultivars: NA

Mature Size: 35-45’ height, 20-30’ spread

Water Needs: med

Spacing: 40-45’

Special Considerations: New horizon cultivar is resistant to Dutch Elm disease and pests. Fast growing with narrow form. Tolerates road salts and clay soil.

04

Prohibited Species

General Notes

- **The following list includes trees that are not recommended for planting along streets. Some of these species are excluded due to their invasive nature, while others may obstruct sightlines or create excessive litter and mess. Additionally, some trees on this list are known to be prone to diseases.**

- **It is important to note that while some trees, such as the Gambel Oak or Mulberry, can be excellent choices in the right setting and environment, they are not suitable for use as street trees. Therefore, it is essential to choose tree species carefully to ensure they thrive in urban landscapes without causing issues.**

Tree Species		
Botanical	**Common**	**Cultivars**
Acer negundo	Common Boxelder	NA
Acer saccharium	Silver Maple	
Acer x freemanii	Freeman Maple	Armstrong, Autumn Blaze, Autumn Fantasy, Sienna Glenn
Ailanthus altissima	Tree of Heaven	NA
Albizia julibrissin	Silk Tree	
Betula spp.	Birch (all species)	
Conifers (all species)		
Elaegnus angustifolia	Russian Olive	
Fraxinus	Ash Species	
Juglans nigra	Black Walnut	
Malus ioensis	Prairie Crabapple	'Plena' (Betchels Crabapple)
Malus x 'Schmidtcutleaf'	Golden Raindrops	'Schmidtcutleaf'
Morus alba	Mulberry (all fruiting species)	NA
Populus spp.	Cottonwood (all species)	
Populus balsamifera	Balm of Gildead	
Populus tremuloides	Aspen Species	
Pyrus calleryana	Callery Pear Tree	'Bradford'
Robinia pseudoacacia	Black Locust	'Purple Robe'
Salix spp.	Willow (all species)	NA
Tilia Americana	American Linden	
Ulmus pumila	Siberian Elm	
Quercus gambelii	Gambel Oak	
Ziziphus mauritiana	Chinese Date	

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Appendix F

Consultation with JVWCD

Consultation with JVWCD

On 8/6/2025 representatives from Jordan Valley Water Conservancy District met with Wesley VanValkenburg (Public Utilities Manager), Bryton Mecham (Utilities Water Quality and Regulatory Administrator), and Wendelin Knobloch (Planning Director) to consult on how the implementation of the Land Use Element and Water Use and Preservation Element of the General Plan will affect water supply and distribution planning.

The representative from the JVWCD reviewed the following with Midvale City:

- JVWCD Water Efficiency standards
- Water conservation programs (e.g., Localscapes)
- Water supply outlook
- Costs of water
- Effect of water conservation on the Great Salt Lake
- Technical aspects of Midvale's water distribution system
- Additional water connections from JVWCD to Midvale's distribution system

JORDAN VALLEY WATER CONSERVANCY DISTRICT

2025 UTAH WATER SAVERS PROGRAMS UPDATE

(Updated 8/6/2025)

Landscape Incentive

	Bluffdale	Draper	GHID	Herriman	JVWCD (Retail)	KID	Magna Water	Midvale	Riverton	South Jordan	South Salt Lake	TBID	WaterPro	West Jordan	White City Water	Grand Total
Active Participants	11	30	29	34	31	15	4	14	26	18	11	39	26	82	16	386
Completed Projects	8	7	12	19	14	8	3	1	9	3	3	24	7	24	6	148
Rebate Amount ($)	$77,847	$30,304	$39,154	$69,001	$91,943	$42,355	$22,857	$11,413	$64,932	$18,898	$9,193	$153,751	$29,079	$154,748	$31,226	$846,702

Localscapes Rewards

Active Participants	3	4	8	2	4	7		2	6	2	3	3	3	14	1	62
Completed Projects									1							1
Rebate Amount ($)									$1,390							$1,390

Smart Controller Program

Total Rebates	7	16	50	48	36	25	9	24	48	76	2	43	53	102	24	563
Rebate Amount ($)	$700	$1,518	$4,840	$4,689	$3,571	$2,406	$877	$2,367	$4,615	$7,492	$200	$4,261	$5,230	$9,909	$2,357	$55,031

Toilet Rebate Program

Total Rebates	1		12		5	2		5	2	3	3	15		14	3	65
Rebate Amount ($)	$150		$2,339		$900	$300		$750	$244	$900	$569	$2,763		$2,361	$429	$11,705

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MIDVALE CITY PLANNING COMMISSION
SUMMARY REPORT
9/10/2025

SUBJECT

Discussion on Unoccupied Accessory Structure and External Accessory Dwelling Unit Standards relating to allowed height and building areas.

SUBMITTED BY

Jonathan Anderson, Planner II

SUMMARY

This discussion will be focused on External Accessory Dwelling Units (EADUs) and our current ordinance regarding their height (feet and stories) and maximum building area.

Midvale Municipal Code 17-7-1.8(D-F):
D. *Height.* The height of an unoccupied accessory structure or an EADU may not exceed twenty feet for a pitched roof and sixteen feet for a flat roof.
E. *Stories.* An unoccupied accessory structure or an EADU may range from one to one and one-half stories.
F. *Building Area.* The cumulative maximum area of all unoccupied accessory structures and an EADU is the larger of nine hundred square feet or thirteen percent of the lot area.

The Planning Department has fielded several calls regarding potential basements for EADUs, which the ordinance currently does not have any regulations regarding in terms of accessory structure area limitations. For EADUs located above a detached garage, the interpretation for a ½ story is based on our current story definition. *"Story" means a habitable level within a building serving to define the building height. For the purposes of this title, each level of a parking structure is one story. Basements or parking structure levels that emerge less than four feet from grade or attics or equipment rooms not exceeding four feet at the kick wall shall not constitute an additional story.* See attachment 2.

ATTACHMENT

1. Midvale Municipal Code 17-7-1.8
2. Example Interpretation

17-7-1.8 Unoccupied accessory structure and external accessory dwelling unit standards.

An unoccupied accessory structure or an external accessory dwelling unit shall meet the following development standards:

A. *Proximity.* An unoccupied accessory structure or an EADU must be located at least six feet from the main building.

B. *Location.* An unoccupied accessory structure or an EADU must be located in either the rear or side yard. An exception for corner lots is provided in subsection (I) of this section.

C. *Setbacks.* An unoccupied accessory structure or an EADU, including eaves, must be a minimum of two feet from the rear and side lot lines; provided, however, that no minimum setback shall be required when all of the following conditions are met: (1) the building contains no openings on the side contiguous to the lot line, (2) no drainage from the roof will be discharged onto an adjacent lot, (3) the building shall have fire resistive walls rated at one hour or more, and (4) the building will not be placed on land designated as a utility easement. All construction must be done in accordance with the building code.

D. *Height.* The height of an unoccupied accessory structure or an EADU may not exceed twenty feet for a pitched roof and sixteen feet for a flat roof.

E. *Stories.* An unoccupied accessory structure or an EADU may range from one to one and one-half stories.

F. *Building Area.* The cumulative maximum area of all unoccupied accessory structures and an EADU is the larger of nine hundred square feet or thirteen percent of the lot area.

G. *Utilities.* An unoccupied accessory structure or an EADU may not have a separate electrical service, gas service, sewer service or water service.

H. *Maintenance.* It is the responsibility of the property owner to ensure the setback area between an unoccupied accessory structure or an EADU and the property line remains free of weeds, junk and debris.

I. *Corner Lot Exception.* An unoccupied accessory structure, but not an EADU, may be allowed where one front yard functions as a side yard. On these lots, unoccupied accessory structures

shall be permitted to encroach within the required front yard subject to the following requirements:

1. The accessory structure may be allowed within one front yard, opposite of the front yard associated with the structural front entrance location.

2. The accessory structure, including eaves, must be a minimum of two feet from all property lines, subject to the following:

   a. The accessory structure must be located behind a minimum six-foot, solid, sight-obscuring fence and the initial height shall correlate with the adjacent fencing height. Said fence shall comply with all fencing requirements in Section 17-7-1.5.

   b. If a non-sight-obscuring fence is existing, proposed to be constructed, or if no fencing is present, the accessory structure, including eaves, must be a minimum of eight feet from all property lines and the initial height shall not exceed eight feet.

   c. For every two feet the accessory structure is set back from the identified property line or fence line, the accessory structure may extend an additional one foot in height, not to exceed a maximum of twenty feet.

3. The cumulative maximum area of all accessory structures shall be one hundred square feet.

4. All construction must be done in accordance with the building code.

5. The accessory structure must be located no less than six feet from the main building.

J. *Number of Unoccupied Accessory Structures.* Multiple unoccupied accessory structures are permitted on each lot so long as each unoccupied accessory structure meets the requirements of this section. (Ord. 2024-26 § 1 (Att. A); Ord. 2022-19 § 1 (Att. A); Ord. 2022-03A § 1 (Att. A); Ord. 2021-19 § 1 (Att. A); Ord. 2017-03 § 1 (Att. A (part)); Ord. 5/4/2010O-3 § 1 (Att. A (part)); Ord. 7/11/2006O-10 § 1 (Exh. B (part)); Ord. 11-13-2001 § 2 (part). Formerly 17-7-1.9)

EADU and Accessory Structures Standards - Height