



# City Council Meeting/Work Session

Tuesday, March 24, 2026 at 7:00 pm

Attendees: Mayor Kevin Dunn, Councilmember Kirk Crowley, Councilmember Ron Skinner, Councilmember Nathan Chamberlain, Councilmember Shane Brewer, Councilmember Todd Westcott, City Manager Kaeden Kulow, Assistant City Manager Megan Gallegos, City Recorder Melissa Gill

## Monticello City Council Meeting

**Meeting Location: Hideout Community Center 648 S Hideout Way**

1. Call to Order
2. Invocation/Opening Remarks/Pledge of Allegiance
3. Public Comment
4. Public Hearing: Monticello City Consolidated Fee Schedule Update (discussion)

### Attachments:

- Consolidated Fee Schedule 260310 (Consolidated\_Fee\_Schedule\_260310.pdf)

5. Public Hearing: Ordinance 2026-03 An Ordinance Prohibiting the Unauthorized Feeding of Protected Wildlife (discussion)

### Attachments:

- Ordinance 2026-03 Prohibiting the Unauthorized Feeding of Protected Wildlife (Ordinance\_2026-03\_Prohibiting\_the\_Unauthorized\_Feeding\_of\_Protected\_Wildlife.pdf)

6. Consider for Approval: Ordinance 2026-03 An Ordinance Prohibiting the Unauthorized Feeding of Protected Wildlife (discussion/action)

Roll Call Vote

7. Water Wise Solar Solutions Presentation (discussion)

### Attachments:

- Monticello Presentation (Monticello\_Presentation\_.pdf)
- NREL FPV 2019 original paper (NREL\_FPV\_2019\_original\_paper.pdf)
- Water Wise Tribune Article Floating Solar Jan 2026 (Water\_Wise\_Tribune\_Article\_Floating\_Solar\_Jan\_2026.pdf)

8. Parent Empowerment Presentation (discussion)

9. **Consider for Approval: Parent Empowerment Signage (discussion/action)**
10. **2025 Planning Commission Recommendations Review (discussion)**

**Attachments:**

- **PC Recomms 2025** (PC\_Recomms\_2025.pdf)

11. **Monticello City Community Survey Analysis (discussion)**

**Attachments:**

- **2026-02-25 Community Survey overview** (2026-02-25\_Community\_Survey\_overview.pdf)
- **2026-02-26 City Survey Analysis** (2026-02-26\_City\_Survey\_Analysis.pdf)

12. **Justice Court Prosecuting Services Discussion**

13. **Consider for Approval: Lloyd's Lake Operational Water Limits (discussion/action)**

**Attachments:**

- **Loyds Lake Stage 4 Limits** (Loyds\_Lake\_Stage\_4\_Limits.pdf)

14. **Consider for Approval: Purchase of Crumb Rubber Material for Crack Sealing (discussion/action)**

**Attachments:**

- **Crack Seal** (Crack\_Seal.pdf)

15. **Truth in Taxation Process (discussion)**

16. **Follow Up Items (discussion)**

17. **Administrative Communications**

18. **Consider Upcoming Agenda Items (action)**

19. **Adjournment (action)**

## **AUDIO FILE**

<https://soundcloud.com/user-250815044/2026-03-24-city-council>

## **NOTICE OF SPECIAL ACCOMMODATIONS**

THE PUBLIC IS INVITED TO ATTEND ALL CITY MEETINGS In accordance with the Americans with Disabilities Act, anyone needing special accommodations to attend a meeting may contact the City Office, 587-2271, at least three working days prior to the meeting. City Council may adjourn to closed session by majority vote, pursuant to Utah Code §52-4-4 & 5. The order of agenda items may change to accommodate the needs of the City Council, the staff, and the public.

		Current Pricing	Recommended
<b>Airport</b>			
<b>Fuel Pricing</b>			
100 LL		\$ 6.80	5.8?
Jet A		\$ 6.00	5.9?

<b>Building Permit Fees</b>			
<b>Permit Fees</b>			
Minor Residential Plan Review (Valuation \$5,000 or less)		NA	\$ 50.00
Residential Plan Review (Valuation \$5,001 or more)		\$ 130.00	
6-month Building Permit Extension Fee		NA	\$ 50.00

<b>Water Connection Fee - Culinary Water</b>			
<b>*Does not include Street Repair, See Street Repair Fees</b>			
<del>5/8"x3/4" No Asphalt</del>		<del>\$ 2,838.13</del>	
<del>1" No Asphalt</del>		<del>\$ 3,503.00</del>	
<del>1.5" No Asphalt</del>		<del>\$ 6,315.07</del>	
<del>2" No Asphalt</del>		<del>\$ 7,263.80</del>	
<del>3" 4" No Asphalt</del>		TBD	
<del>5/8" 3/4" Short Side Street/Asphalt</del>		<del>\$ 4,168.13</del>	
<del>1" Short Side Street/Asphalt</del>		<del>\$ 4,833.00</del>	
<del>1.5" Short Side Street/Asphalt</del>		<del>\$ 7,645.07</del>	
<del>2" Short Side Street/Asphalt</del>		<del>\$ 8,356.80</del>	
<del>3" 4" Short Side Street/Asphalt</del>		TBD	
<del>5/8"x3/4" Long Side Street/Asphalt</del>		<del>\$ 5,643.13</del>	
<del>1" Long Side Street/Asphalt</del>		<del>\$ 6,308.00</del>	
<del>1.5" Long Side Street/Asphalt</del>		<del>\$ 9,120.07</del>	
<del>2" Long Side Street/Asphalt</del>		<del>\$ 9,831.80</del>	
<del>3" 4" Long Side Street/Asphalt</del>		TBD	
1" Connection Fee			\$ 4,000.00
1.5" Connection Fee			
2" Connection Fee			\$ 8,900.00

3" Connection Fee		Determined Case by Case
4" Connection Fee		
Sewer Connection Fee	\$ 600.00	Determined Case by Case
Impact Fee	\$ _____	
<b>Water Connection Fee - Secondary Water</b>		
1" Line	\$ 2,463.00	\$ 3,600.00
<del>1.5" Line</del>	<del>\$ 4,102.98</del>	
2" Line	\$ 4,609.03	
3" Line	\$ Determined on case by case basis	
4" Line	\$ Determined on case by case basis	

**Garbage Fees**

<b>Additional Fees</b>		
Unauthorized Item during Garbage Collection (i.e. Mattresses in dumpster) \$15 increase per consecutive incident	\$	35.00

**Hideout Rentals**

<b>Rentals</b>				
Linens (per linen)	\$	2.00	\$	3.00
Technology (Sound System & Projector)		NA	\$	50.00
Technology Deposit		NA	\$	30.00

**Licenses**

<b>Animal License Fees</b>				
Unaltered Registration Fee	\$	10.00		
Spayed & Neutered Registration Fee	\$	10.00		
Yearly Renewal Fee		NA	\$	-

**Parks**

<b>Parks, Pavilions, Gazebos, Church, &amp; Fields</b>			
Deposit For Each Reservation	\$	25.00	
Veterans Memorial Pavilion (under 4 hours)	\$	35.00	
Veterans Memorial Pavilion (over 4 hours)	\$	-	\$ 60.00
Ballpark Pavilion (under 4 hours)	\$	35.00	
Ballpark Pavilion (over 4 hours)	\$	-	\$ 60.00
Ballpark Field			\$50.00 per field
Ballpark Field Lights (lights until 10 pm)	\$	55.00	\$ 20.00
Circle Park Pavilion (under 4 hours)	\$	35.00	\$ 25.00
Circle Park Pavilion (over 4 hours)	\$	-	\$ 40.00
Pioneer Park Gazebo	\$	25.00	
Pioneer Park Church	\$	50.00	
Lloyds Lake Picnic Area	\$	35.00	
Lloyd's Lake Pavilion	\$	35.00	

**Planning & Zoning Fees**

Sign Permit	\$	10.00	\$ 20.00
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**Recreation**

<b>Youth Recreation Programs - New</b>			
Youth Cheer			\$ 45.00
<b>Youth Recreation Programs</b>			
Girls Basketball - All Grades	\$	45.00	
<del>1st &amp; 2nd Grade Girls Basketball</del>	<del>\$</del>	<del>30.00</del>	<del>\$ 45.00</del>
T-Ball	\$	25.00	\$ 30.00
Soccer	\$	30.00	\$ 45.00
Flag Football	\$	30.00	\$ 45.00
<b>Adult Recreation Programs</b>			
Men's Fast Pitch League	\$	350.00	\$ 400.00

<b>Streets</b>			
<b>Water Line Installation ONLY - Street Repair Fees</b>			
Mobilization Fee - Per Repair		NA	\$ 200.00
Trenching & Backfill		NA	\$180.00 per yard
Asphalt Replacement		NA	\$5.00 per sqft
<b>Excavation/Encroachment Fees</b>			
Application Fee	\$	25.00	\$ 35.00
Mobilization Fee - Per Repair		NA	\$ 200.00
Trenching & Backfill		NA	\$180.00 per yard
Asphalt Replacement		NA	\$5.00 per sqft

<b>Utility Fees</b>			
<b>Sewer</b>	<b>Sewer Rate(Tenant)</b>		
	Fixed Facilities Fee - Monthly	\$ 18.60	\$ 20.46
<b>Water</b>	<b>Culinary Water Rate (Tenant)</b>		
	Fixed Facilities Fee - Monthly	\$ 28.60	\$ 31.46

<b>Culinary Water Rate (Residential No 2nd Available) - Tier 1</b>			
	Fixed Facilities Fee - Monthly	\$	31.46
	0-9,000 gallons (per 1,000 gallons)	\$	1.60
	9,001-20,000 gallons (per 1,000 gallons)	\$	2.03
	20,001-30,000 gallons (per 1,000 gallons)	\$	1.10
	30,001-50,000 gallons (per 1,000 gallons)	\$	1.65
	50,001-60,000 gallons (per 1,000 gallons)	\$	10.00
	>61,000 gallons (per 1,000 gallons)	\$	55.00

<b>Culinary Water Rate (Residential No 2nd Available) - Tier 2</b>			
	Fixed Facilities Fee - Monthly	\$	31.46
	0-9,000 gallons (per 1,000 gallons)	\$	1.60
	9,001-20,000 gallons (per 1,000 gallons)	\$	2.03
	20,001-30,000 gallons (per 1,000 gallons)	\$	2.10
	30,001-50,000 gallons (per 1,000 gallons)	\$	5.65

50,001-60,000 gallons (per 1,000 gallons)	\$	15.00
>61,000 gallons (per 1,000 gallons)	\$	55.00

**Culinary Water Rate (Residential No 2nd Available) - Tier 3**

Fixed Facilities Fee - Monthly	\$	31.46
0-9,000 gallons (per 1,000 gallons)	\$	1.60
9,001-20,000 gallons (per 1,000 gallons)	\$	2.03
20,001-30,000 gallons (per 1,000 gallons)	\$	5.10
30,001-50,000 gallons (per 1,000 gallons)	\$	10.65
50,001-60,000 gallons (per 1,000 gallons)	\$	25.00
>61,000 gallons (per 1,000 gallons)	\$	55.00

**Culinary Water Rate (Residential No 2nd Available) - Tier 4**

Fixed Facilities Fee - Monthly	\$	31.46
0-9,000 gallons (per 1,000 gallons)	\$	1.60
9,001-20,000 gallons (per 1,000 gallons)	\$	7.03
20,001-30,000 gallons (per 1,000 gallons)	\$	21.10
30,001-50,000 gallons (per 1,000 gallons)	\$	31.65
50,001-60,000 gallons (per 1,000 gallons)	\$	55.00
>61,000 gallons (per 1,000 gallons)	\$	80.00

**Secondary Secondary Water Rate(Residential Tier 1)**

Fixed Facilities Fee - Monthly	\$	20.00
0-10,000 gallons (per 1,000 gallons)	\$	-
10,001-20,000 gallons (per 1,000 gallons)	\$	0.50
20,001-35,000 gallons (per 1,000 gallons)	\$	1.00
35,001- 50,000 gallons (per 1,000 gallons)	\$	2.00
50,001-60,000 gallons (per 1,000 gallons)	\$	3.00
>60,001 gallons (per 1,000 gallons)	\$	5.00

**Secondary Water Rate(Residential Tier 2)**

Fixed Facilities Fee - Monthly	\$	20.00
0-10,000 gallons (per 1,000 gallons)	\$	-

10,001-20,000 gallons (per 1,000 gallons)	\$	0.50
20,001-35,000 gallons (per 1,000 gallons)	\$	2.00
35,001- 50,000 gallons (per 1,000 gallons)	\$	4.00
50,001-60,000 gallons (per 1,000 gallons)	\$	6.00
>60,001 gallons (per 1,000 gallons)	\$	10.00

**Secondary Water Rate(Residential Tier 3)**

Fixed Facilities Fee - Monthly	\$	20.00
0-10,000 gallons (per 1,000 gallons)	\$	-
10,001-20,000 gallons (per 1,000 gallons)	\$	2.00
20,001-35,000 gallons (per 1,000 gallons)	\$	5.00
35,001- 50,000 gallons (per 1,000 gallons)	\$	10.00
50,001-60,000 gallons (per 1,000 gallons)	\$	20.00
>60,001 gallons (per 1,000 gallons)	\$	30.00

**Secondary Water Rate(Residential Tier 4)**

Fixed Facilities Fee - Monthly	\$	20.00
0-5,000 gallons (per 1,000 gallons)	\$	-
5,000 -10,000 gallons (per 1,000 gallons)	\$	5.00
10,001-20,000 gallons (per 1,000 gallons)	\$	10.00
20,001- 34,000 gallons (per 1,000 gallons)	\$	20.00
34,001-50,000 gallons (per 1,000 gallons)	\$	50.00
>50,001 gallons (per 1,000 gallons)	\$	75.00

**Misc.**

**Additional Fees**

Late Fee (Processed after the listed due date)	1.5% or \$10 max	2% or \$20 max
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**Water Fill Stations**

Culinary (per 1,000 gallons)	\$	14.50	\$	15.00
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**CITY OF MONTICELLO**

**ORDINANCE 2026-03**

**AN ORDINANCE PROHIBITING THE UNAUTHORIZED FEEDING OF  
PROTECTED WILDLIFE**

WHEREAS, the attracting and feeding of protective wildlife within the City limits results in the deposit of refuse, debris, fecal matter, and other offensive substance; attraction of predatory wildlife; and creates traffic hazards and property damage;

WHEREAS, Monticello City has within its limits protected wildlife population in such numbers that they are a threat to the health, safety, and wellbeing of its citizens;

WHEREAS, adoption of this ordinance is required by the Division of Wildlife Resources in order to initiate an urban deer management program; and

WHEREAS, the City Council has determined that the following ordinance is in the City's best interest.

NOW THEREFORE, BE IT ORDAINED BY THE MUNICIPAL COUNCIL OF THE CITY OF MONTICELLO, UTAH, AS FOLLOWS:

SECTION 1: Title 4 is hereby amended to include Chapter 9 as follows:

**4-9-1 DEFINITIONS**

For the purpose of this title, unless it is evident from the context that a different meaning is intended, certain terms used in this chapter are defined as follows:

**PROTECTED WILDLIFE:** includes all protected wildlife as defined by Utah State Code.

**PERSON:** includes any individual, partnership, corporation, association, other legal entity.

**PROPERTY OWNER:** The actual owner, agent or custodian of the residence or business building, whether individual, partnership or corporation. The lessee shall also be construed as an "owner" for the purpose of this chapter.

**4-9-2 UNAUTHORIZED FEEDING OF PROTECTED WILDLIFE**

A. Unless otherwise expressly permitted by law, no person shall deposit, place, or distribute any fruit, grain, hay, vegetable, salt, or other food or material, of any kind of nature, with the intent to attract or feed deer on public or private lands.

B. It shall be presumed that the placement of fruit, grain, hay, vegetable, minerals, salt, or other food or material in aggregate volume of more than one-half gallon and

at height of less than six feet (6') off the ground, or in any drop feeder, automatic feed, or similar device regardless of height, is for the purpose of feeding protected wildlife in violation of this section. This presumption may be overcome through the presentation of reasonable evidence that the placement of such materials is for a purpose other than the feeding of protected wildlife. Naturally growing plants, gardens, residue maintained as a mulch pile, and bird feeders designed or placed to limit access to protected wildlife are not prohibited under this section.

C. The provisions of this Ordinance shall not apply to any resident or agent of the City authorized to implement a wildlife management program and who possesses the necessary permits from the State of Utah, nor shall it apply to any public officer or public employee in the performance of their duties.

D. An agent of Monticello City may authorize temporary feeding of protected wildlife for the purpose of counting the wildlife population, baiting traps, or other public purposes.

#### 4-9-3 VIOLATION AND PENALTY

City officials shall issue a written warning for the first offense under this section. Thereafter, further violation of this ordinance shall be \$100.00 fine for each infraction.

SECTION 2. If any provision of this ordinance is declared invalid by a court of competent jurisdiction, the remainder shall not be affected thereby.

SECTION 3. This ordinance shall become effective immediately upon passage and approval.

**PASSED, ADOPTED, AND APPROVED** by the Monticello City Council, Monticello, Utah, this 24<sup>th</sup> day of March 2026.

\_\_\_\_\_  
Kevin Dunn, Mayor

ATTEST:

\_\_\_\_\_  
Melissa Gill, CMC, UCC

An aerial photograph of a large-scale floating solar array installed on a reservoir. The solar panels are arranged in a grid pattern across the water's surface. The surrounding landscape includes a line of trees and a clear blue sky.

# Water Wise Solar: Floating Solar on Municipal Water Storage Ponds

*Monticello Municipal Water Treatment*

*February 10th, 2026*

*Prepared for: Chris Baird, Melissa, Jazzy and City Council Members*

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# The floating solar opportunity addresses multiple challenges in the West

The need to **conserve water** for human and environmental needs

The need to **conserve land** for other economic and environmental purposes

The need for **more energy generation** and associated economic development



# Floating solar has water conservation advantages, along with other co-benefits

WaterWise Solar- Confidential -

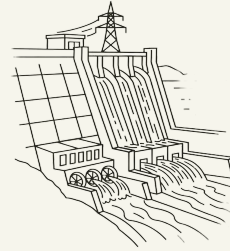
1

**Significantly reduced evaporation over water surface covered by floating solar** (depending on local climate, water conservation can be **50-80% of evaporative water losses**) (NREL, 2019)



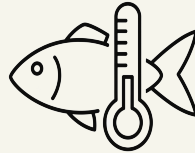
2

**Provides increased flexibility from existing grid energy sources** - provides operational flexibility for water and wastewater treatment, hydropower and other industrial power users.



3

**Reduces surface water temperature for healthy aquatic ecosystems** - providing constraints on harmful algal blooms (HABs), and additional tools for managing fish habitat



4

**Does not compete for other land use activities\***, compared to conventional solar. When sited near existing water and wastewater treatment or hydropower, floating solar requires less transmission build



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\* Recreation amenities of water bodies need to be assessed for public good tradeoffs, optimal siting of arrays, or potential integration with new marine recreational infrastructure

# Floating solar projects at different scales - utilities are "low-hanging fruit"

## Municipal and industrial small reservoir (FOCUS)



- Hedge against increasing grid power costs
- Self-provision of energy for adjacent treatment facilities - pumping, treatment, and conveyance
- No competing uses (i.e recreation)

## Hydropower - matching projects



- Ability to enhance existing hydropower operations
- Proximity to transmission and substation infrastructure
- Improve economics for local irrigation companies
- **Largely under federal control**

## Large multi-use lakes or reservoirs



- Large (300- 1+ GW) projects are possible when sited away from recreation or other sensitive areas
- Ability to pair with large conventional baseload
- **Possible revenue source for other water conservation projects**

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*All applications have water conservation opportunities of 50-80% of evaporative losses*

## Key characteristics

- **Uses standard solar panels**
- **Runs more efficiently** than land-based due to temperature buffering effects
- **Enables higher energy density** per surface area
- **No land disturbance or leasing costs**
- **Integrated with other baseload generation and / or battery storage**

## Utility Examples (US)



- **Healdsburg, CA 4.7 MW**
- **Gray water storage pond**



- **Windsor, CA 1.8 MW..**
- **"Recycled" water pond**

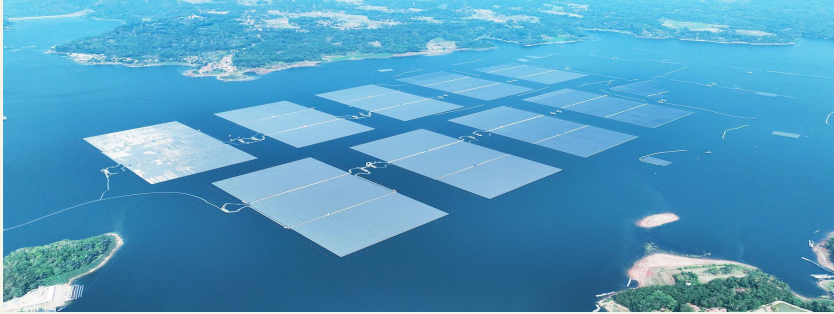


- **Park City, UT 0.6 MW**
- **Raw Water Storage Pond**



- **Sayreville, NJ, 4.4 MW**
- **Raw water storage pond**

## Examples (International)



- West Java, Indonesia, 500 MW
- Linked with Cirata hydropower / reservoir



- Three Gorges New Energy, China (2017)
- 150 MW hydropower reservoir



- CECEP 70 MW, China (2019)
- Water Storage Reservoir



- Changhua County, Taiwan 440 MW
- Tidal flats-designed for tides, saline water and wind/wave action.

# Floating Solar Implementation on water utility ponds is straightforward

WaterWise Solar- Confidential -

## Technology

- **Floating solar is proven technology** (floats, racking, anchors, standard panels)
- Already has been deployed in Utah ( **Signal Hill Treatment, Summit County**; other references available in CA, NJ, CO)

## Water Operations

- **Utility operations do not change** (*this is additional onsite power availability*)
- Water quality is not affected

## Budget-positive Ownership and Power

- **No capital expenditure required - This is an additional revenue stream.....**
- Water Wise Solar can develop, own, and maintain (including upfront payment + lease)
  - Power purchase can guarantee rates for 10-20 years
  - (Alternative option = the water utility can own the array with no power purchase)
- **Water utility maintains control** over pond operations

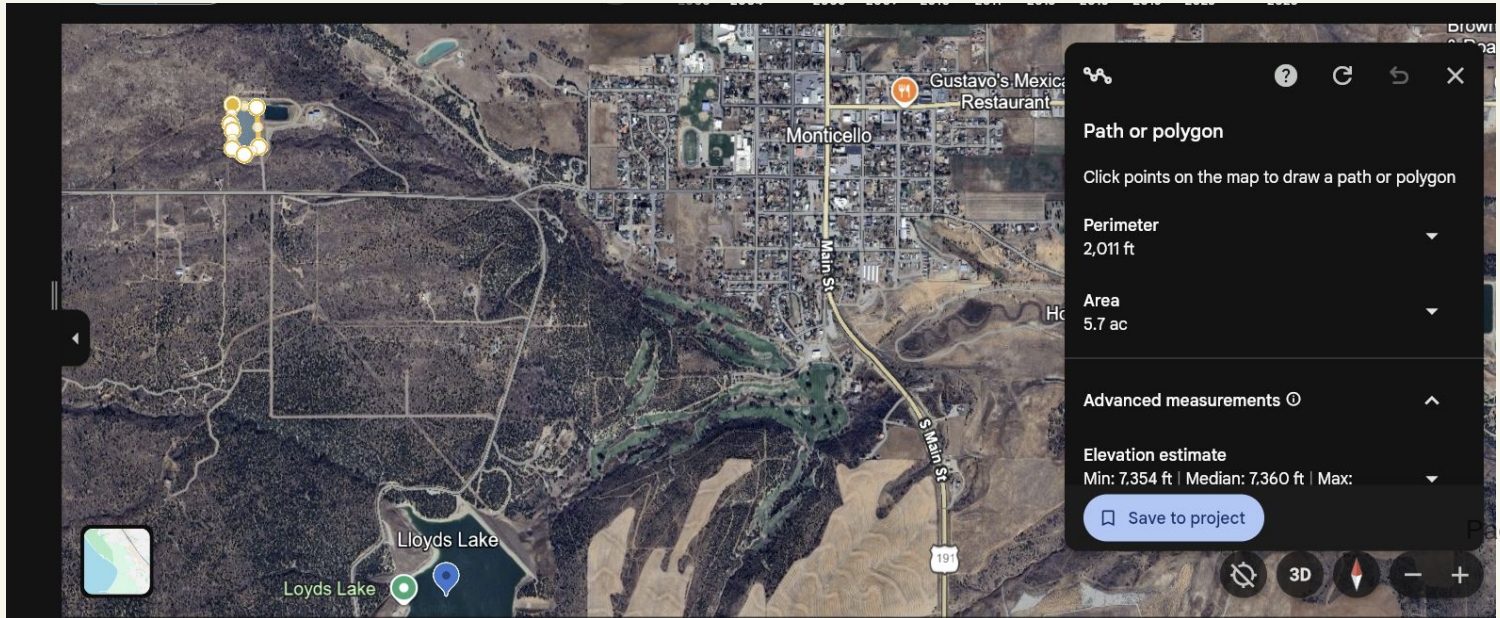
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# Monticello Water Pond Floating Solar Opportunity

Floating  
Solar  
Opportunity

- 7 acres of surface area (2 ponds) can fit approximately 3.5 MW of daytime generating capacity, each
- **Covering 50% (3.5 acres total) saves 12-15 acre/ft per year to evaporation and 1.75 MW of daytime generating capacity for the treatment plant.**

Assumed  
location



\* assuming 80% evaporation reduction at 3-4 acre-feet/feet / year)

# We would love to work with you

## Next steps

- **We would like to invite further discussion on how to optimize floating solar.**
- This discussion can be at engineering, management or Board levels, sharing experiences from other utilities
- We know there is considerable **policymaker enthusiasm to explore innovative solutions** to both conserve water and operating costs for utilities

## Who we are



### Jim Andersen

*Founder and Chief Developer - Water Wise Solar Solutions*

- Extensive energy project development experience and relationships
- Special expertise in complex EPC / delivery
- Univ. Portland (MBA, Energy/ Environment focus); Arizona State University (B.S. Supply Chain Management)
- [jim@waterwisesolar.com](mailto:jim@waterwisesolar.com)



### Lee Addams

*Founder, Open Trail Ventures, LLC; Head of Strategy and Growth, WaterWise Solar*

- Advisory experience at Ernst & Young - Parthenon (Partner); McKinsey & Company
- Valmont Industries (NYSE:VMI) management team ; irrigation technology company CEO
- Stanford University (Ph.D Earth Sciences / Hydrology); Brigham Young University (B.Sc. Applied Physics)
- [addams@opentrailventures.com](mailto:addams@opentrailventures.com)

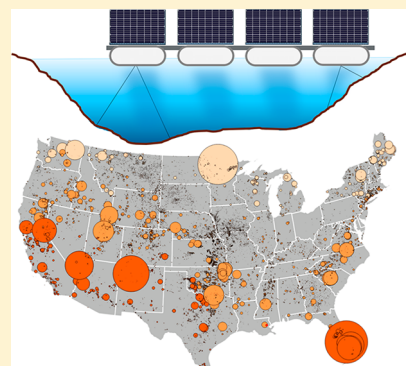
# Floating Photovoltaic Systems: Assessing the Technical Potential of Photovoltaic Systems on Man-Made Water Bodies in the Continental United States

Robert S. Spencer,<sup>\*</sup> Jordan Macknick, Alexandra Aznar, Adam Warren, and Matthew O. Reese

National Renewable Energy Laboratory (NREL), 15013 Denver West Parkway, Golden, Colorado 80401, United States

## Supporting Information

**ABSTRACT:** Floating photovoltaic (FPV) systems, also called floatovoltaics, are a rapidly growing emerging technology application in which solar photovoltaic (PV) systems are sited directly on water. The water-based configuration of FPV systems can be mutually beneficial: Along with providing such benefits as reduced evaporation and algae growth, it can lower PV operating temperatures and potentially reduce the costs of solar energy generation. Although there is growing interest in FPV, to date there has been no systematic assessment of technical potential in the continental United States. We provide the first national-level estimate of FPV technical potential using a combination of filtered, large-scale datasets, site-specific PV generation models, and geospatial analytical tools. We quantify FPV co-benefits and siting considerations, such as land conservation, coincidence with high electricity prices, and evaporation rates. Our results demonstrate the potential of FPV to contribute significantly to the U.S. electric sector, even using conservative assumptions. A total of 24 419 man-made water bodies, representing 27% of the number and 12% of the area of man-made water bodies in the contiguous United States, were identified as being suitable for FPV generation. FPV systems covering just 27% of the identified suitable water bodies could produce almost 10% of current national generation. Many of these eligible bodies of water are in water-stressed areas with high land acquisition costs and high electricity prices, suggesting multiple benefits of FPV technologies.



## INTRODUCTION

Floating photovoltaic (FPV) systems, also called floatovoltaics, are an emerging technology application in which solar photovoltaic (PV) systems are sited directly on bodies of water instead of land or buildings.<sup>1,2</sup> Competing uses for land and recognized co-benefits associated with siting FPV systems on water are driving factors in the development of this niche application.<sup>3–6</sup>

To date, FPV has been installed predominantly on man-made bodies of water, such as wastewater storage ponds, reservoirs, remediation and tailing ponds, and agricultural irrigation or retention ponds.<sup>1,7</sup> The first FPV installation came online in 2007 at the Far Niente Winery in California, yet the vast majority of existing systems (98%) became operational between 2014 and 2016.<sup>1,8</sup> As of 2017, global installed capacity was approximately 198 MW, with additional projects, including what will be the world's largest FPV system at 70 MW, expected to come online in 2018.<sup>9</sup> System sizes vary dramatically across the world, ranging from 4 kW to 40 MW.<sup>1,7,9,10</sup> FPV systems have also been installed in more than a dozen countries throughout Southeast Asia, Europe, North America, and the Middle East, but Japan has the majority<sup>1</sup> (80%) of FPV installed capacity, including 70 of the largest FPV systems in the world.<sup>8,9,11</sup> The United States has seen limited adoption of FPV to date, but institutions such as

reservoir operations, water treatment facilities, and residential communities are increasingly exploring its applications.

FPV adapts modules used in traditional ground-mounted or rooftop PV, with important mounting design and configuration differences to enable flotation. FPV can be flat, tilted, or tracking.<sup>7,12–15</sup> Electrical equipment, such as inverters, typically resides on shore, and electricity is transmitted from the FPV system via floating or underwater cables. The buoy structures are anchored or tethered to land or the floor of the water body.<sup>7,16</sup> Some FPV systems are designed such that they can rest on the ground when or if the supporting body of water is drained. Systems must be designed to withstand fluctuating water levels, high wind and wave loads, and various extreme weather conditions. Saltwater in some tailings pond and seawater applications may pose additional challenges and require tailored mitigation measures (e.g., corrosion-resistant materials) as a result of the corrosive qualities of water with high salinity.<sup>6,12,17</sup>

FPV systems demonstrate unique energy and non-energy co-benefits compared to land-based PV systems. Research surrounding the performance of FPV systems is relatively

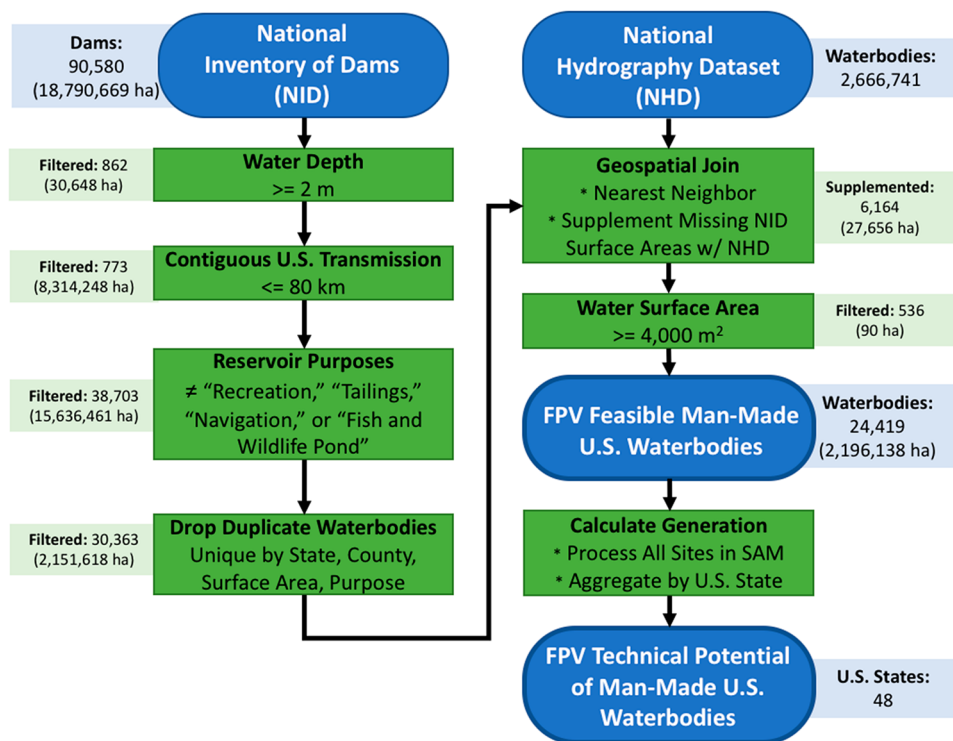
**Received:** August 23, 2018

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## Data Processing: Datasets (■) &amp; Workflow (■)



**Figure 1.** Overview of the data processing used to estimate FPV potential. All filter extents are relative to their original datasets (i.e., not mutually exclusive).

immature, but existing studies indicate that these systems experience power conversion efficiency gains as a result of lower ambient temperatures underneath the panels, regardless of whether the panels are directly or indirectly sited on water.<sup>1,2,13,14,17–22</sup> Power production gains of 1.5–22% have been documented as a result of the cooling effect of water on FPV systems.<sup>17,20,23,24</sup> The collocation and operation of FPV with hydroelectric facilities has also yielded multiple energy benefits, such as increased energy output, better ability to meet peak demand, and cost savings as a result of the existing transmission infrastructure.<sup>24,25</sup> Additionally, FPV systems reduce water evaporation on reservoirs by reducing airflow and absorbing solar radiation that would ordinarily be absorbed by water,<sup>2,16,24,26,27</sup> an attractive quality for water managers. FPV systems reportedly have minimal impact on wildlife, except for the often desirable reduction of algae growth.<sup>7,21</sup> However, it is unclear whether the same reduction in sunlight penetrating the water surface that purportedly reduces algae growth also adversely affects other aquatic life. FPV systems have been evaluated for potential synergies with aquaculture.<sup>28</sup> Avoidance of land-energy conflicts (e.g., fuel versus food, land for conservation) is another purported benefit of FPV,<sup>6,23</sup> and while there are anecdotal claims of lower land acquisition and site preparation costs for FPV compared to land-based PV, comprehensive cost data to confirm these claims is lacking.

FPV systems have emerged as a potential solution to address land-use requirements of PV in land-constrained areas. Roughly 7% (or 685 924 km<sup>2</sup>) of the United States is covered by water, including all coastal and inland waters and the Great Lakes.<sup>29</sup> The various benefits of FPV could lead to water being a new key target of solar siting. Although the energy technical

potential of different market segments of ground-based PV is well-known,<sup>30</sup> there has been no robust quantification of the technical potential of FPV in the United States to date. This paper further characterizes current FPV projects in the United States and internationally, provides national- and state-level estimates of FPV technical energy potential, and identifies how variations in land value, utility rates, and annual water evaporation rates showcase promising regions for siting FPV.

## ■ MATERIALS AND METHODS

This paper quantifies the technical potential for the deployment of FPV systems on man-made water bodies in the contiguous United States, subject to physical water body limits, reservoir usage restrictions, reservoir ownership, and proximity to the electric grid. We characterize the theoretical limit of available resources that could feasibly support the development of FPV and set the foundation for future analyses to consider market adoptability and economic potential. Our objective was to determine a conservative upper bound on the potential for FPV deployment in the U.S.

The following methods outlined below utilized free and open-sourced geoprocessing tools (PostgreSQL/PostGIS, Python, and QGIS) to clean, join, filter, and analyze the data as well as visualize the results. Figure 1 provides an overview of the process used to estimate FPV potential, and the source code can be found within the Supporting Information. The extent of the filters shown in Figure 1 are relative to the original dataset to highlight the individual influences of each assumption made, because they are not mutually exclusive (e.g., water depth and water surface area).

The scope of this work considers only the use of man-made bodies of water as a result of the assumption that artificially

created bodies of water would be more likely suitable for FPV development than natural bodies of water. This assumption serves to (1) provide a more conservative estimate, (2) address the fact that man-made reservoirs are already managed and, therefore, installing solar equipment is likely to be easier as a result of the presence of existing infrastructure/roads/etc., (3) address the fact that there might be greater environmental concerns associated with natural reservoirs, and (4) address that existing FPV projects are almost universally installed on “impounded bodies of water”.<sup>9</sup> Therefore, as a proxy for identifying man-made bodies of water, we used the National Inventory of Dams (NID) of the United States Army Corps of Engineers, which provides a dataset of dam structures in the United States.<sup>31</sup> The criteria for the dams included in the NID are outlined in the [Supporting Information](#).

In addition to identifying whether dams are man-made or not, the NID includes attributes such as reservoir surface area, maximum depth, owner types, and purposes. However, surface area was not comprehensive for all entries (missing 24.5%). To supplement the surface area data, we utilize the National Hydrography Dataset (NHD) of the United States Geological Survey, a digital geospatial dataset that maps the surface water of the nation’s drainage networks and related features, including rivers, streams, canals, lakes, ponds, glaciers, coastlines, dams, and stream gages.<sup>32</sup> To join these datasets, we performed a spatial collocation on each NID coordinate to find the closest body of water within the NHD using nearest neighbor geoprocessing tools in QGIS. The NID designates the location of the dam structure, and therefore, the coordinates would fall on or near the edge boundary of the NHD water body.

The attributes in the NID allow for additional filtering and characterization based on current FPV projects, including water depth ([Figure S3](#) of the Supporting Information) and surface area ([Figure S4](#) of the Supporting Information). To maintain a conservative estimate and to reflect current industry trends, we used the 10th percentile as the filter criteria, resulting in a minimum threshold of 1 acre (4000 m<sup>2</sup>) surface areas and 7 ft (2 m) depths. The depth criteria eliminated 1% of sites and 0.2% of area from the total, while the minimum size criteria eliminated 0.6% of sites and <0.01% of area from the total. We then produced a subset of the data from these criteria by filtering the data with PostgreSQL.

Furthermore, all sites located >80 km (50 miles) away from transmission lines were considered infeasible for the scope of this study (although there could be an additional potential and unique benefit for these remote areas in an international or development context). Man-made bodies of water within 80 km of U.S. ABB’s Ventyx provided electric transmission line data for the contiguous United States<sup>33</sup> represent approximately 44% of the surface area of man-made water bodies in all U.S. territories. Using PostgreSQL/PostGIS, we applied an 80 km (50 mile) buffer to these shapefiles containing geospatial line data and then dissolved them into polygons within QGIS to create a clipping mask, which was trimmed further to the boundaries of the contiguous United States and then used to filter out nonfeasible water bodies.

We further filtered these potential bodies of water by their identified purposes. The NID “Purposes” attribute includes a list of all designated purposes of the water body, with the first purpose listed representing the primary purpose. All reservoirs that include any “Recreation”, “Tailings”, “Navigation”, or “Fish and Wildlife Pond” purpose tags were removed as

nonfeasible (83% of potential surface area). While the utilization of tailings ponds would be an ideal use of space, they were removed as a result of the uncertain impact of their harsh corrosive environments on FPV systems. It is also possible that some reservoirs with recreational or navigational activities could be suitable for FPV, but the coverage of these reservoirs is uncertain as a result of the potential for usage conflicts; therefore, these were excluded. The remaining water bodies were recategorized by their primary purpose into the following groups: “Water Supply”, “Irrigation”, “Hydroelectric”, and “Control, Stabilization, and Protection”.

Finally, because the NID dataset is a representation of dam structures, we cleaned the dataset to represent unique water bodies, because there are many cases where multiple dam structures are associated with the same reservoir. The duplications of water bodies were filtered out by finding unique combinations of state, county, purposes, and surface area. This filtering resulted in the removal of 11.5% of the NID records and 33.5% of the total surface area.

With a new filtered dataset of feasible locations, we scripted the System Advisor Model (SAM) tool<sup>34</sup> to calculate the electric generation at each dam coordinate. On the basis of the characterization of area-to-capacity ratios of current FPV projects ([Figure S2](#) and [Table S2](#) of the Supporting Information), we calculated a capacity density of 10 000 m<sup>2</sup>/MW. Additionally, we assumed 27% system coverage of the water surface area based on the median value of current FPV projects shown in [Figure S5](#) of the Supporting Information, because there is very little correlation between the water surface area and system coverage within the current characterized projects ([Figure S6](#) of the Supporting Information). We used a specified tilt angle of 11°, which is commonly used for FPV installations, resulting in high-density arrangements.<sup>15,35</sup> Higher tilt angles are generally not deployed in FPV settings as a result of concerns about wind loading, shading that would occur from densely packed panels, and increased material costs that would arise from installing at higher angles. All other assumptions were set by the SAM default settings, which are based on the most recent standard installations in the United States, including panel/system efficiency and fixed-tilt rigging. We simulated annually generated output for each water body (calculated through SAM), then aggregated for the sum of generation and surface area within each state, primary owner, and primary purpose using Python. These aggregations were then joined to U.S. state shapefiles in QGIS to be geospatially visualized in the figures provided in the [Results and Discussion](#).

With the locations of feasible water bodies already identified, we estimated the current net evaporative losses (without any FPV mitigation) using the weather station statistics input files used by the Cligen model developed by the United States Department of Agriculture (USDA).<sup>36</sup> Cligen is a stochastic weather generator that produces daily estimates of precipitation, temperature, dew point, wind, and solar radiation for a single geographic point, using monthly parameters (means, standard deviations, skewness, etc.) derived from the historic measurements.<sup>36</sup> Using the monthly data of 2648 stations in the contiguous United States from station input files of Cligen, we calculated the net evaporative monthly losses at each station from the Penman–Monteith equation

$$ET_0 = \frac{0.408\Delta(R_n - G) + \gamma \frac{900}{T + 273} u_2 (e_s - e_a)}{\Delta + \gamma(1 + 0.34u_2)}$$

where  $ET_0$  is the net evapotranspiration (mm/day),  $T$  is the temperature ( $^{\circ}\text{C}$ ),  $\Delta$  is the slope of the vapor pressure–temperature curve ( $\text{kPa}/^{\circ}\text{C}$ ),  $G$  is the soil heat flux ( $\text{MJ m}^{-2} \text{h}^{-1}$ ),  $\gamma$  is the psychrometric constant ( $\text{kPa}/^{\circ}\text{C}$ ),  $R_n$  is the solar radiation ( $\text{MJ m}^{-2} \text{h}^{-1}$ ),  $u_2$  is the wind speed at 2 m above the water surface (m/s),  $e_s$  is the saturated vapor pressure (kPa), and  $e_a$  is the actual vapor pressure (kPa).<sup>37</sup> The temperature ( $T$ ) was estimated as the average of maximum and minimum temperatures. Wind speed was calculated by taking the weighted average of 16 wind directions (i.e., N, NNE, NE, ENE, etc.) The soil heat flux ( $G$ ) was assumed to be 0.0 for open surfaces of water bodies. Intermediary calculations were required to determine  $\Delta$ ,  $e_s$ , and  $e_a$  using the following equations:<sup>37</sup>

$$\Delta = \frac{4098(0.6108)\exp\left(\frac{17.27T}{T + 237.3}\right)}{(T + 237.3)^2}$$

$$e_s = 6.11 \times 10^{(7.5T/237.3+T)}$$

$$e_a = 6.11 \times 10^{(7.5T_{\text{dew}}/237.3+T_{\text{dew}})}$$

With the sum of monthly net evaporative losses calculated at each of the 2648 coordinates spanning the United States, we calculated an annual evaporation raster by using a linear triangular interpolation within the QGIS geoprocessing plugins to obtain continuous coverage between stations. The feasible FPV locations were then spatially collocated on the resulting raster by intersection in QGIS to extract the approximated annual evaporation rates over individual water bodies. Evaporation rates for individual water bodies are reported in the [Results and Discussion](#) as well as the state-aggregated volumetric evaporative losses calculated by multiplying the local evaporation rates by the water body surface areas and then summed by state.

Land values were obtained from the USDA<sup>38</sup> as the average value of croplands and pastures in each state for 2017. These values were tabularized and joined to state shapefiles in QGIS to be visualized alongside the cumulative potential FPV surface area. Land area calculations of ground-mounted PV installations are assumed to be 6 acres/MW (24 000  $\text{m}^2$ /MW) based on data from Choi et al.<sup>14</sup>

We obtained utility retail costs from the U.S. Energy Information Administration<sup>39</sup> as the average utility retail rates within each state in 2016. These values were tabularized and joined to state shapefiles in QGIS to be visualized alongside the cumulative potential FPV generation.

## RESULTS AND DISCUSSION

**Current FPV Projects and Generation Potential.** The technical potential of FPV systems in the United States was calculated on the basis of assumptions derived from current configurations of existing FPV systems implemented internationally. We calculated an average system capacity density of 10 000  $\text{m}^2$ /MW from an evaluation of 51 projects ( $R^2 = 0.994$ ) throughout the world. As shown in [Figure S2](#) and [Table S2](#) of the Supporting Information, this density is much higher than that of land-based systems, which are represented by green, blue, and yellow dashed lines as fixed, 1-axis, and 2-axis

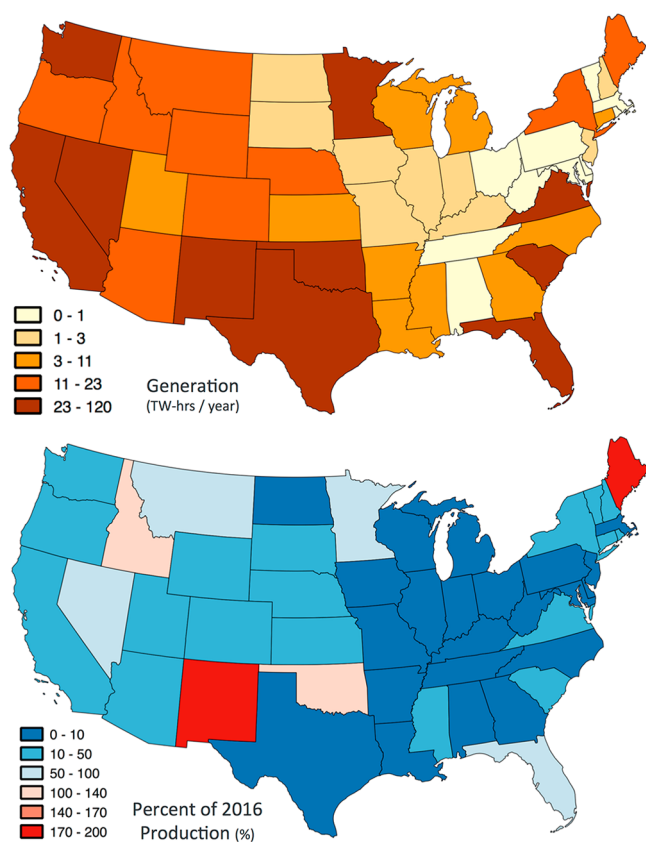
installations, respectively. This is a result of positioning FPV panels at a lower tilt angle ( $\sim 11^{\circ}$ ) than their land-based counterparts. This allows for panel rows to be spaced much closer to one another. The trade-off is that the low tilt is no longer optimized for maximum incident solar, particularly at the higher latitudes. Further research is needed on the optimal tilt angle for FPV systems in the U.S. While there is an increase in capacity per acre for lower angles, there is a loss in the effective generation of an individual panel.

According to the NHD, there are 2 666 741 water bodies spanning the United States. Of these, there are 90 580 dammed water bodies, making up about 3.4% of the total. We identified 24 419 of the dammed water bodies as being feasible for installing FPV based on the screening criteria outlined above. The error originating from the geospatial join to the NHD to supplement surface areas is estimated to be less than 2% (an underestimate) as a result of inaccurate joins to adjacent water bodies and/or disagreements between datasets. The supplemented surface areas from NHD only accounted for around 1.3% (27 656 ha) of the total surface area (2 196 138 ha) considered for FPV potential. This error and its derivation is discussed further in the [Supporting Information](#). This dataset provides a conservative starting point, because there are man-made water bodies that are not included in the NID dataset (see NID dataset criteria in the [Supporting Information](#)) and it could be feasible to deploy FPV on natural water bodies or reservoirs that were excluded from this analysis. For instance, the FPV system installed in 2007 on the irrigation pond at Far Nientes Vineyard is excluded from this dataset, because it does not meet the criteria specified by NID (shown in the [Supporting Information](#)). Although this limitation results in the underestimation of the true technical potential (not including very small water bodies), the NID still provides the best source of reliable data in which to determine any level of siting feasibility at the national scale. Further state- or regional-level studies would benefit from higher fidelity datasets with comprehensive records, including adequate attributions to establish site feasibility.

As shown in [Figure 2](#), covering the surface area of all 24 419 eligible water bodies in the United States would support 2116 GW of installed FPV; covering only 27% of the surface area of the reservoirs could produce 786 TWh of electricity per year, roughly 9.6% of 2016 electricity production in the United States.<sup>39</sup> Generation amounts scale linearly with water body coverage, meaning potential generation would double if 54% of eligible water bodies were to be covered by FPV infrastructure. Varying the tilt angle from  $5^{\circ}$  to  $15^{\circ}$  led to a change in annual generation of  $-4$  and  $+2\%$ , respectively, from the  $11^{\circ}$  standard assumption, assuming constant capacity for a given area. Although changing the tilt angle could result in some variations in panel densities and capacities, this capacity difference was not addressed in the sensitivity analysis as a result of a lack of empirical evidence.

The states with the highest generation potential are relatively dispersed throughout the country. Even though we would expect the southwestern states to dominate with an abundance of solar resources and overall state area (including both land and water), other states have comparable generation potential as a result of a higher availability of feasible water body surface area. Smaller states in the Mid-Atlantic and Northeast have lower generation potentials, limited by their size.

Normalizing FPV potential by current electricity generation in each state shows that FPV generally provides a higher



**Figure 2.** (Top) Potential annual generation of FPV systems covering 27% of feasible U.S. water bodies. (Bottom) Potential annual generation by FPV systems covering 27% of feasible U.S. water bodies as a percentage of the annual production in 2016 by state.

percentage of total state generation in the western United States than in the eastern United States (Figure 2). While the national production potential is 9.6% of current generation, there is substantial regional variation. Four states (Idaho, Maine, New Mexico, and Oklahoma) have FPV generation potential that exceeds current total production in their respective state, whereas 22 states have FPV potential that could contribute less than 10% of current total production.

The feasibility and attractiveness of deploying FPV technologies can be dependent upon primary purposes and ownership of water bodies (Figure 3). FPV potential from water bodies with irrigation as the primary purpose is concentrated in the western United States, whereas FPV potential from hydroelectric, water supply, and control/stabilization/protection reservoirs is more uniformly distributed throughout the country. Considering the primary purpose, the control/stabilization/protection-purposed water bodies account for 47% of all FPV generation potential. For primary ownership, federally owned water bodies account for the plurality of potential FPV generation, at 42% (Figure 3). The makeup of FPV potential by primary purpose varies based on reservoir ownership. For example, federal- and state-owned water body FPV generation potential is dominated by control/stabilization/protection water bodies, but public utility and private owner reservoir FPV potential is dominated by hydroelectric FPV potential. Local-government-owned reservoir FPV potential is primarily composed of control/stabilization/protection and water supply purposes.

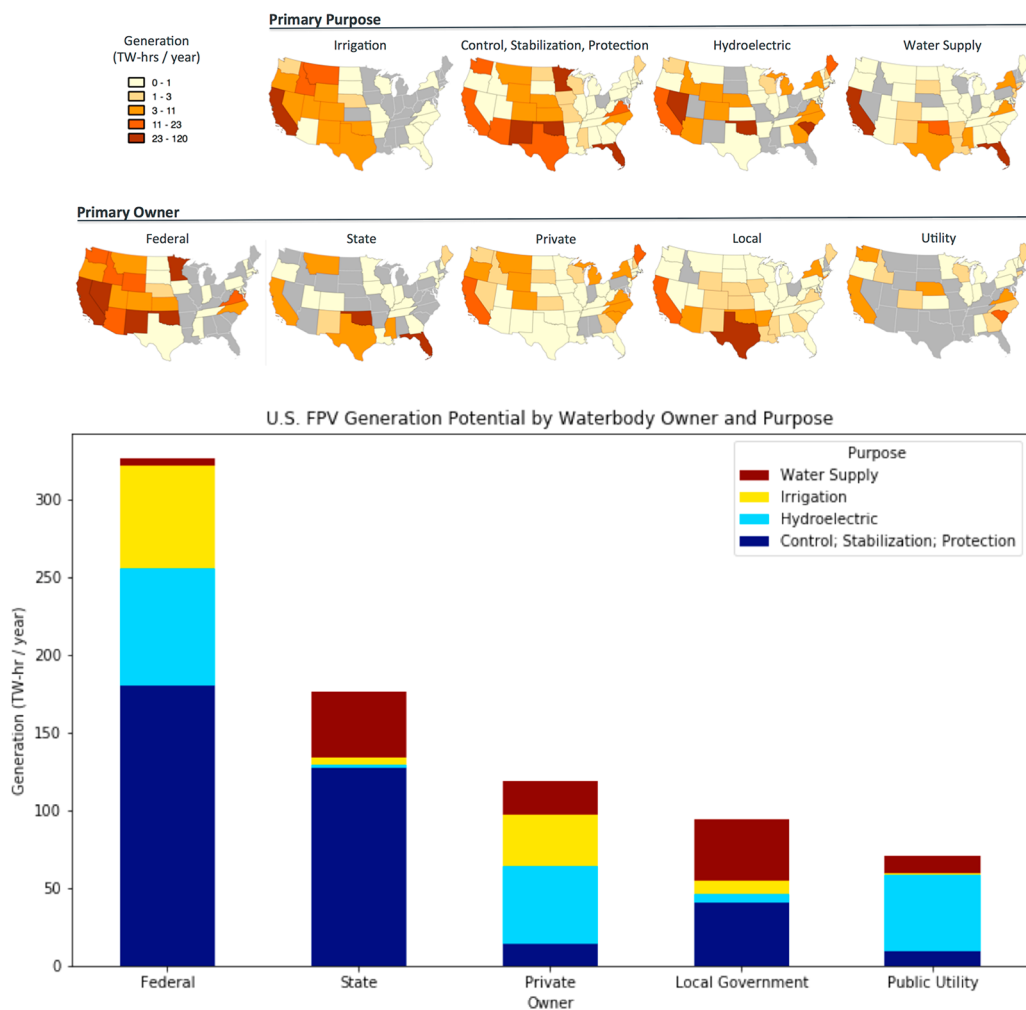
**Potential Co-benefits and Siting Considerations of FPV.** FPV technologies have the potential to provide additional non-energy benefits. Studies have addressed how FPV can be integrated with aquaculture activities as well as water treatment facilities to reduce algae blooms.<sup>1,28</sup> In this section, we quantify some other co-benefits and siting considerations of FPV as they relate to land conservation, local electric utility rates, and evaporative losses.

One major benefit of FPV is the opportunity for land conservation, where the implementation of FPV does not compete with lands used for other purposes, such as crop and pasture land in agriculture. Just as rooftop solar can be suitable in highly dense and high-value urban areas, FPV can alleviate the land demand of traditional ground-mounted PV and avoid costs of land acquisition in expensive areas. Figure 4 illustrates the average value of crop and pasture land by state (as dot color) and the potential accumulated land area (as dot size) that would be saved using FPV over land-based PV installations (on the man-made bodies of water identified by the screening process outlined above). Nationally, there are roughly 2 141 000 ha of potential land savings. The greatest amount of water surface area available is around 309 000 ha in Florida, which is approximately 1.8% of the total area of the state. Additionally, Florida is covered by an abundance of small ponds that are not represented in these results, further suggesting that this state in particular could be significantly underestimated. Florida and California are both states that have a relatively large amount of potential water surface area while also having relatively higher cost land values of \$18 323/hectare and \$16 816/hectare, respectively. Six of the seven FPV projects currently installed in the United States are located in these two states. New Jersey has the highest average land value of \$31 506/hectare and is home to the seventh FPV project. The national average is about \$9738/hectare. Table S1 of the Supporting Information provides tabulated values of average land values by state as well as potential surface area.

Another benefit and siting consideration is the incentive of PV market adoptability to generate electricity within service areas of high local utility costs.<sup>40</sup> Figure 5 shows the average retail utility cost (as dot color) and the potential FPV generation (as dot size). California has favorable generation potential with high retail utility costs at 15.5 cents/kWh, while the median cost across all states lies at 9.5 cents/kWh. Table S1 of the Supporting Information provides tabulated values of average retail utility rates by state in cents/kWh. FPV or PV systems in general have the potential to be strong economic alternatives to providing distributed or utility-scale energy production.

The coverage of a reservoir with a FPV system may provide the benefit of mitigating evaporative losses, particularly in hot, arid regions. The calculations and interpolations between stations provide a continuous value map for the net evaporation rate (measured empirically as pan evaporation) at any point across the United States, as shown in Figure 6. The rate ranges from below 90 cm/year in the Northeast to more than 245 cm/year in the dry and arid Southwestern states.

Derived from this data, Figure 6 shows every feasible body of water for FPV installation; the dot color designates the net evaporation rate and the dot size is proportional to the annual evaporation by volume from the reservoir. There is a substantially larger amount of volume lost per reservoir in the southern states where there is larger and sparser water



**Figure 3.** (Top) Potential annual generation of FPV systems covering 27% of feasible U.S. water bodies, categorized by the primary purpose and primary owner of the water bodies.

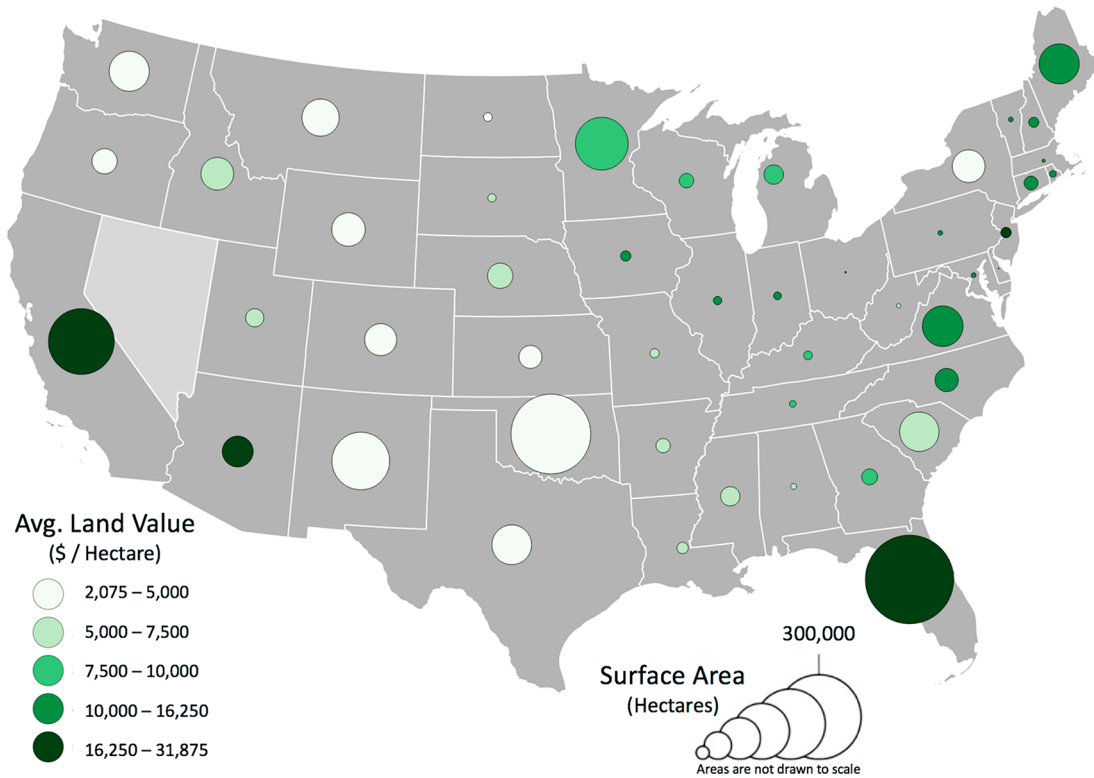
bodies, while there is an abundance of smaller water bodies spread throughout other areas of the United States. The large outlier in Minnesota (Lower Red Lake) has a low evaporation rate but is nevertheless impacted by large evaporative losses as a result of its large surface area of over 125 000 ha. Figure 6 shows total annual volumetric evaporation in each state, and Table S1 of the Supporting Information presents tabulated values. The amount of this evaporation that could be avoided through the installation of FPV technologies would depend upon the FPV technology selected, water body coverage, and specific characteristics of each reservoir, which are beyond the scope of this technical potential study.

**Limitations.** The field of implementing PV systems over water is a nascent field, with just over 100 projects internationally and seven projects in the United States as of the end of 2017. Most of what we know about FPV is derived from this limited number of projects and has formed the assumptions on which this assessment of its technical potential in the contiguous United States is based. With this limited number of projects (the majority of which are less than 2 years old), there is a lack of empirical data documenting long-term system performance, financial burdens, operations and maintenance, material science, environmental impacts, and other key factors. With the rapid expansion of projects coming online both domestically and internationally and the growing

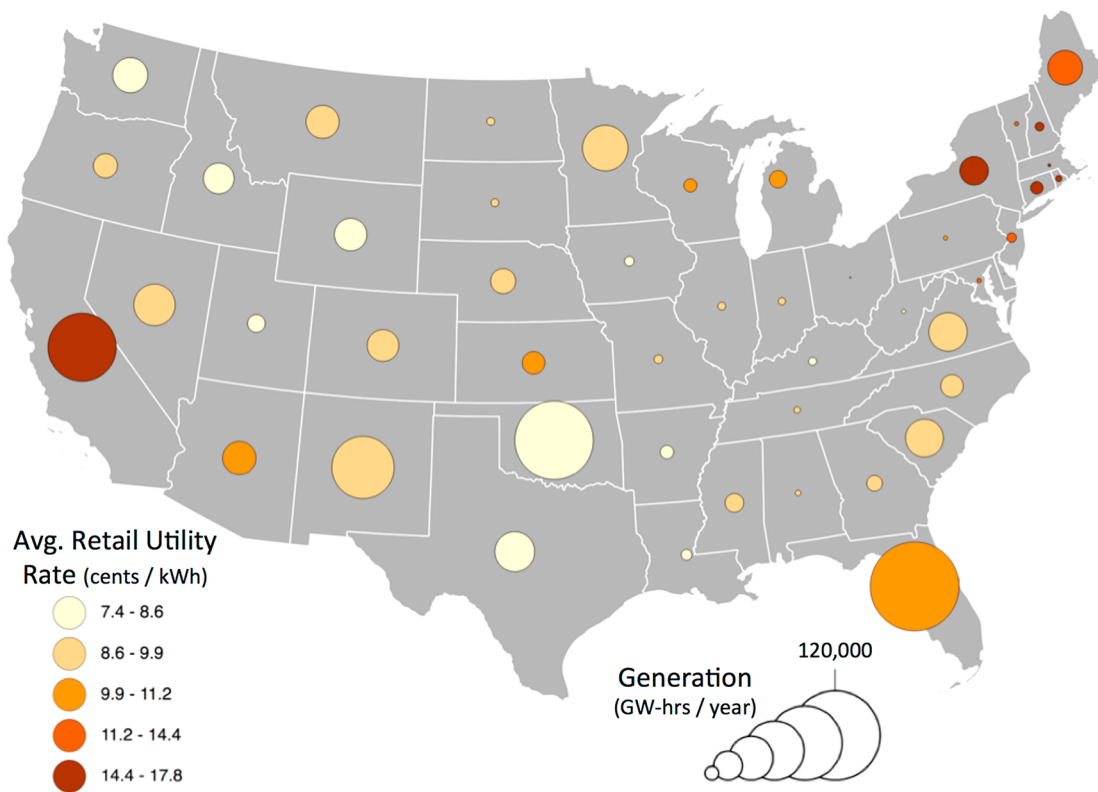
interests in FPV research, we can expect an equally rapid increase in case studies and publicly available data to follow. This burgeoning attention will open the doors to answering questions about realistic expectations for a FPV system. To address these long-term knowledge gaps, research needs to be conducted on the material durability of FPV, such as how these systems may endure in various climates and conditions.

Although this paper calculates the technical potential for FPV systems using geospatial tools, there are other site-specific limitations that may affect the feasibility of a certain location. The high-level data used and analyzed lacks the resolution for case-by-case feasibility, and the results should only be considered as a starting point for national and regional examinations. This analysis is an approximation and can only be as good as the dataset on which it is based. Further analyses should be conducted to look at the technical potential at the state level with higher fidelity datasets and perform case studies on individual water bodies.

Along with the need for further analysis to determine the feasibility of implementing FPV, additional research is needed to understand the added benefits of using water-based installations compared to land-based counterparts. For instance, the evaporative losses quantified in this paper are aggregated as a large-scale approximation simply to capture the extent of the potential impact and lack the granularity and



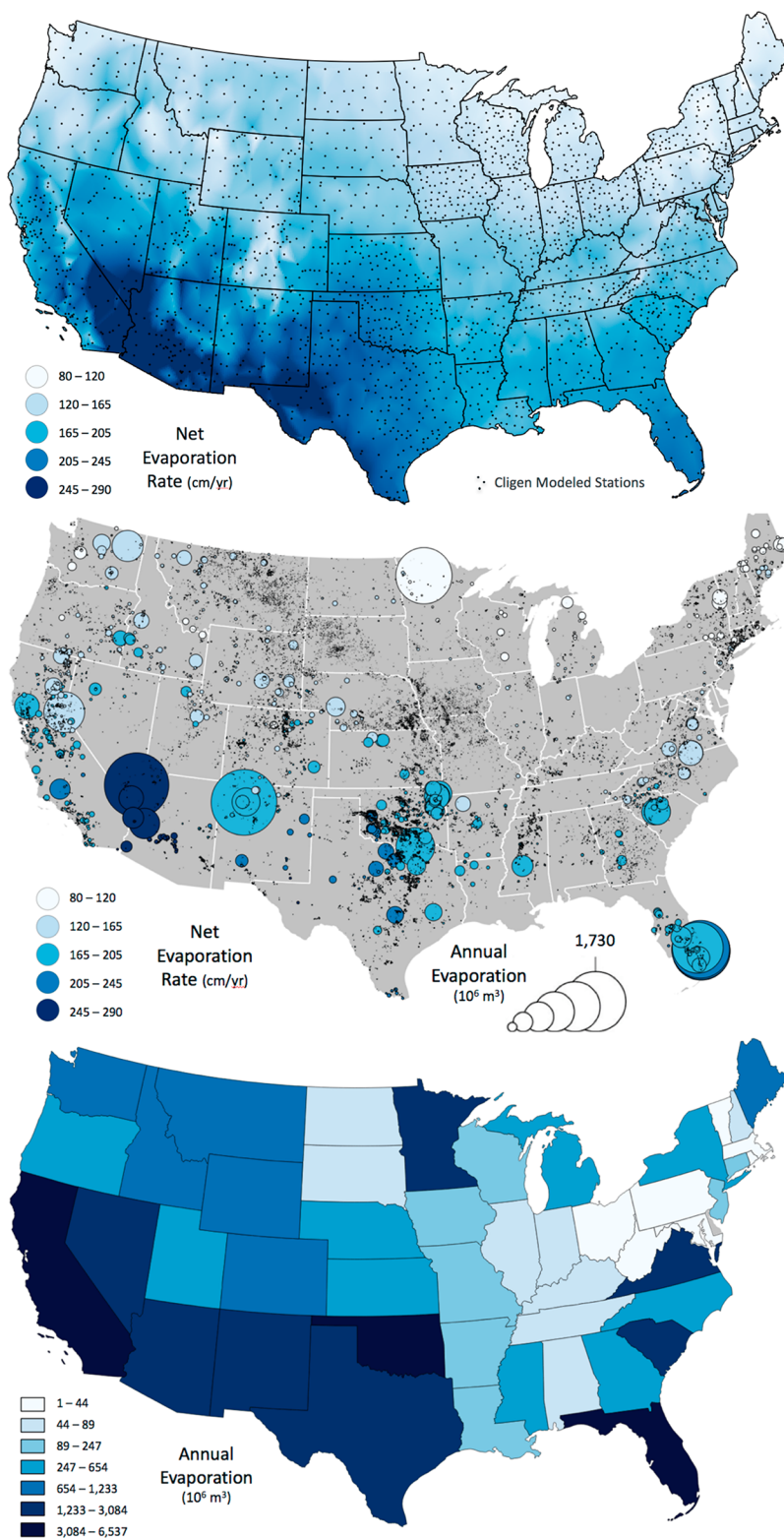
**Figure 4.** Cumulative surface area (dot size) of feasible U.S. water bodies for FPV installation by state and the associated average land values for the state (dot color). Circles are not drawn to scale of states.



**Figure 5.** Potential generation (dot size) of FPV installations on feasible U.S. water bodies by state and the associated average retail utility rates for the state (dot color).

precision at the local level. There is uncertainty associated with the extent to which FPV, with varying levels of water body coverage, reduces evaporation in various regions. Furthermore,

water markets are complex, with high regional and temporal variability, and attempting to assess the economic impact on the national scale is beyond the scope of this study. Targeted



**Figure 6.** (Top) Estimated net evaporation rates of open surface water bodies in the United States. (Middle) Net evaporation rate (dot color) and annual volumetric evaporation loss (dot size) of each FPV-feasible water body in the contiguous United States. (Bottom) Net volumetric evaporation in each state every year from FPV-feasible water bodies.

case studies can empirically measure evaporation reductions, water quality improvements, panel efficiency gains, equipment weathering, and other factors while assessing associated impacts in terms of the local economic benefits and trade-offs.

Using conservative assumptions on available man-made bodies of water, we estimated 2116 GW of FPV could be developed in the continental U.S.; covering 27% of the surface area on these bodies of water has the potential to generate 9.6% of current electricity generation. Relaxing some

conservative assumptions on reservoir coverage of FPV systems, available reservoirs, and including natural water bodies could substantially increase this potential. This potential shows that the U.S. could benefit from this rapidly emerging technology and that growing focus on FPV within the domestic research community could be advantageous. This significant opportunity warrants future research into the optimal siting, technology configuration, PV chemistries, and material properties of FPV systems. Additional research into potential co-benefits related to evaporation, algae growth, and panel temperature and output are also needed to fully understand the benefits and potential limitations of this new technology.

## ■ ASSOCIATED CONTENT

### ● Supporting Information

The Supporting Information is available free of charge on the ACS Publications website at DOI: [10.1021/acs.est.8b04735](https://doi.org/10.1021/acs.est.8b04735).

NID dataset criteria, NHD supplementation of NID: estimation of error (Figure S1), aggregated FPV potential data by state (Table S1), characterizations of current FPV projects (Table S2 and Figures S2–S6), analysis source code, and data citations (PDF)

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### Notes

The authors declare no competing financial interest.

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# Could floating solar help save Utah’s shrinking lakes — and boost the state’s power supply?

Great Salt Lake and Utah Lake are the “biggest targets” for a company’s plan to build floating solar arrays and prevent evaporation.



(Seth Wenig | AP Photo) An array of solar panels float on top of a water storage pond in Sayreville, N.J., Monday, April 10, 2023. Floating solar panel farms are beginning to boom in the United States after rapid growth in Asia. They're attractive not just for their clean power and lack of a land footprint, but because they also conserve water by preventing evaporation.

By  [Opt-Out Signal Honored](#) 2026, 6:00 a.m.



this month.

Rep. Hoang Nguyen, D-Salt Lake City, joined representatives with Utah-based [Water Wise Solar Solutions](#), advocating for floating solar panels across Utah water bodies. The panels could help slow evaporation on lakes and reservoirs while also supplementing the grid with some much-needed electricity, Nguyen said.

“It’s something that’s intriguing to me,” Nguyen said, speaking to the Legislative Water Development Commission on Jan. 9. “We have to think outta the box. We have to be creative.”

No bills or draft legislation have been introduced to advance the idea of floating solar, but the notion sparked bipartisan interest among commission members.

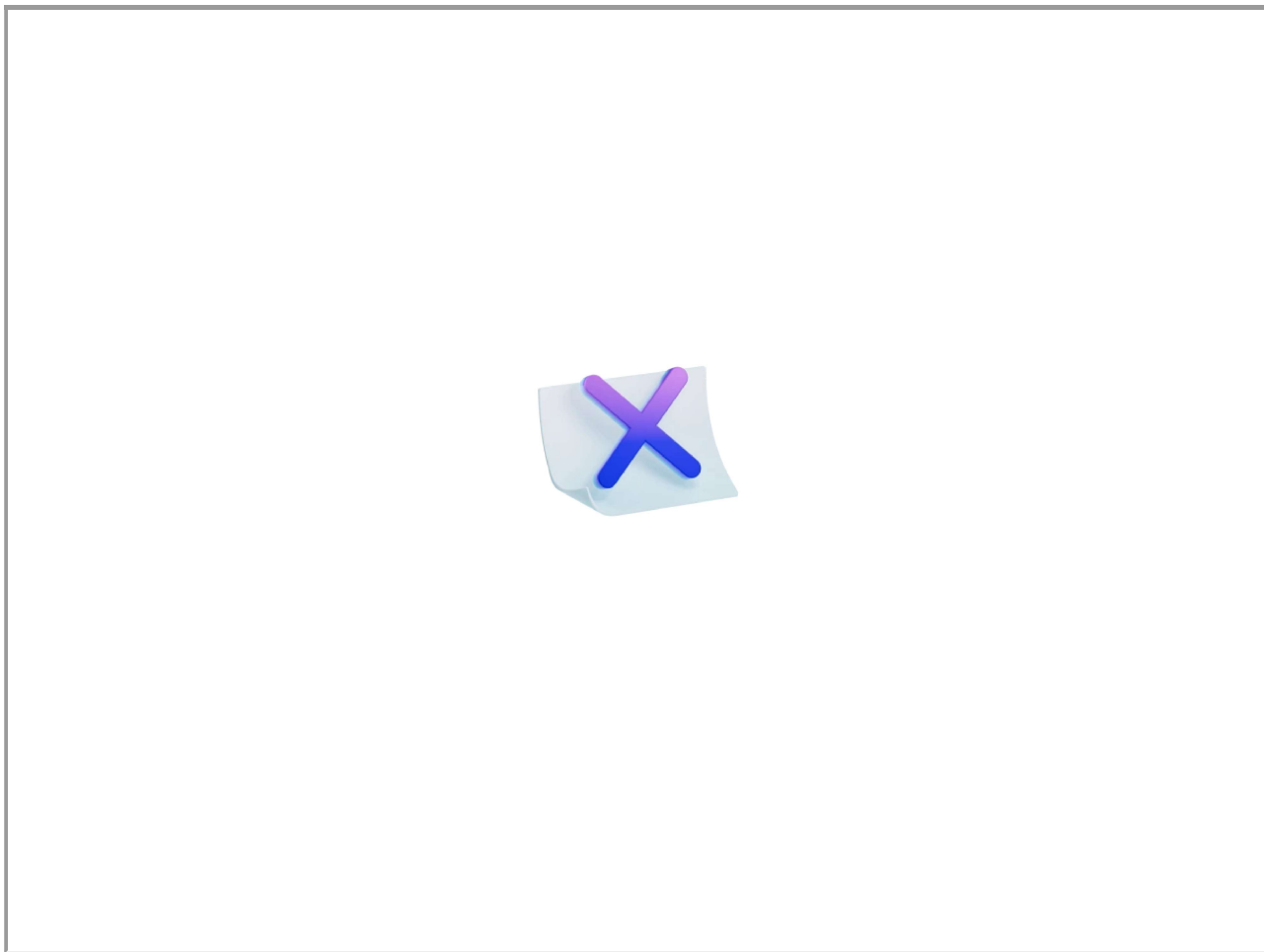
Prolonged dry conditions and overconsumption have caused both the Great Salt Lake and Lake Powell in the Colorado River watershed to shrink to record lows in recent years. Meanwhile, a surge in demand for artificial intelligence, data centers and electrified transpiration are putting unprecedented pressure on power generation.

The Great Salt Lake loses nearly 3 million acre-feet a year to evaporation, representatives with [Water Wise Solar Solutions](#) [told the commission](#), while reservoirs around the state lose a collective 1 million acre-feet.



environmental uses other than sprawling solar farms.

“This has already been done around the country,” Lee Addams with Water Wise Solar told lawmakers in a presentation.



He presented photos of solar arrays on storage ponds in California and New Jersey, along with a new cluster of panels floating on the Signal Hill Pond near Park City. The latter project was installed so local utilities could prevent algal growth before water is fed into a treatment plant. [The Park Record](#) reported. The array helps power the water filtration process.

● Opt-Out Signal Honored



“[Where] we would love to see some support from the Utah Legislature is helping us work with the federal government and allowing us to protect our own water resources, as well as generate power,” said Jim Andersen, founder of Water Wise Solar.

The most ambitious plans, however, call for panels on Utah’s biggest natural water bodies — Utah Lake and the Great Salt Lake. Large solar projects there could generate up to 1 gigawatt, Addams said.

“There are no illusions that the Great Salt Lake and Utah Lake aren’t going to be difficult,” Addams said, noting potential complications with protecting wildlife. “But those are also our biggest targets.”



(Francisco Kjolseth | The Salt Lake Tribune) A rare sight lights up the sky as a solar flare strikes the planet and the northern lights are reflected in the shores of the Great Salt Lake on Saturday, May 11, 2024.

Gov. Spencer Cox has sought to more than double the state’s energy output over the next decade through his “Operation Gigawatt.” Cox calls it an “all-of-the-above” strategy that explores both traditional and innovative solutions.

The parts of the Great Salt Lake closest to transmission lines and population centers also happen to be areas like Farmington Bay, Bear River Bay and the Ogden Waterfowl Management Area that are most productive for migrating waterfowl and the invertebrates they eat.

“I’ve heard some solar panel situations can be determinantal to birds,” said Rep. Scott Chew, R-Jensen, following the floating solar presentation. “Our water bodies have a lot of birds that come in.”

would need to conduct a study to reduce impacts.

Lawmakers noted that sprawling panel arrays could also interfere with recreation on both natural lakes and popular reservoirs.



(Rick Egan | The Salt Lake Tribune) Boats on Jordanelle Reservoir on Saturday, July 19, 2025.

Scott Paxman, general manager of Weber Basin Waster Conservancy District, called panels a “big deterrent” for boats and water skiing on some of the bigger reservoirs his agency operates, like Pineview and Willard Bay. Arrays might make sense on smaller



pond ... and clean underneath.”

While some commissioners seemed skeptical about placing panels on lakes and reservoirs, they indicated it could be a good solution over canals to both prevent evaporation and smother water-sucking weeds. Weber Basin is already exploring such projects, Paxman said.

Trevor Nielson, general manager of the Bear River Canal Company in Box Elder County, said he wasn't sure panels over his canals would pencil out financially.

He said that public utilities should be involved in the discussions “so that the amount paid out for the power provided is sufficient.”

“Otherwise it'll be a great bill and a great thing, but it won't be widely adopted,” added Nielson, whose canal company of mostly agricultural shareholders is the biggest water user on the Bear River, the Great Salt Lake's largest tributary.

The power payout may make economic sense when combined with the value of water irrigators save, noted Commission Chair Keven Stratton, a Republican House member representing Orem.

“We need to look at an analysis,” Stratton said, “of the value of the water created per acre” by shading solar panels.

Floating solar farms can also lower water temperatures, Andersen noted, facilitating healthier streams and lakes for aquatic life, including native fish.

“As we all know,” Andersen said, “it's getting slightly hotter than it used to be.”



is wary of the idea of floating solar panels on the massive lake.

“The infrastructure is going to be hammered by the conditions,” de Freitas said.

The hypersaline nature of the Great Salt Lake corrodes metal. Its dense water is also prone to wave action and floods that can take a toll on infrastructure.

“The maintenance,” de Freitas said, “would be incredible.”

## Help The Tribune report the stories others can't— or won't.

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**PLANNING COMMISSION RECOMMENDATIONS TO CITY COUNCIL IN 2025**  
**City of Monticello, Utah**

**1. Planning Commission:** Julie Bailey's application for reappointment to the Planning Commission was forwarded to the City Council with a recommendation to appoint and she began her service in February. All members completed the online Utah Open Meetings Act training. Commissioner Bennett attended the online Utah Land Use Institute training on March 27 and online Boundary Line Adjustment training by Land Use Academy of Utah on April 15. City Recorder reviewed Resolution 2025-14, Rules of Order and Procedure for the Governing Bodies of Monticello City. In December Commissioner Bennett's application for reappointment was forwarded to City Council with a recommendation to approve.

**2. Annexation Policy Plan:** Following a schedule prepared by City staff, a draft of the plan was approved by the Planning Commission for use at the Special Public Meeting on April 15, which was attended by 19 members of the public. It was followed in June by a public hearing attended by 8 members of the public. To keep on schedule the Planning Commission held another special meeting in June to review public comments. Another public hearing was held on July 1 and attended by 3 members of the public. On July 15 the Planning Commission recommended forwarding the Annexation Policy Plan to City Council for approval.

**3. Zone Change Application:** Parcel A33240305410 to change from A-1 to R-2 was received but cancelled when City staff learned the change had already been made and administrative overview was sufficient to resolve the issue.

**4. Title 10 Zoning Updates to Permitted Uses:** Discussions began with City staff review of where permitted uses seemed inappropriate for a zone or were confusing. City staff also informed the Planning Commission that the state is moving away from conditional uses, favoring more detail in permitted uses. The county's 2024 assessment of housing needs was presented and recommendations will be included in considering changes to permitted uses. Planning Commissioners assisted City Staff to find appropriate descriptions and definitions for existing and new uses in order bring clarity to codes. In December the Planning Commission and City staff made the last edits, but finalizing the uses cannot be done until the General Plan process is further along.

**5. Title 10, Chapter 2 Parking and Storage of Recreational Vehicle, and Chapter 15 Recreational Vehicle Parks:** City Council and City staff reviewed the existing code and requested that changes be made to address administrative issues and citizen comments. In December the Planning Commission forwarded the changes to the City Council with a recommendation to approve.

**6. Title 11 Subdivision Regulations:** Draft changes to this title were made to comply with Utah code, then reviewed by the City Attorney. Further work scheduled in 2026.

**7. General Plan:** City Council and Planning Commission met together to discuss updating the 2018 General Plan and the Planning Commission reviewed the Utah code requirements for a general plan. A survey was designed and made available to the public to collect ideas for changes to be addressed in the general plan; results to be analyzed in February 2026. City staff and Planning Commission documented progress made on implementing the goals of the 2018 plan.

**City of Monticello, Utah**  
**SUMMARY OF COMMUNITY GENERAL PLAN SURVEY**  
No. Survey Responses: 219 • Percent of City represented: 12%

***SUMMARY OF REASONS TO LIKE MONTICELLO***

- 38% appreciate the small, close-knit, quiet and safe feel of the community
- It is easy to get to outdoor recreation and the setting is beautiful
- City has good parks, trails, golf course, and Loyd's Lake
- City hosts public programs and events and people are supportive of them

***SUMMARY OF WHAT MONTICELLO NEEDS***

- 30% or more want more businesses in Monticello
- 11% want an affordable recreation center
- Improve community pride and invite everyone
- 6% want more and upgraded City parks, trails, and playgrounds
- More activities for all age groups, but especially teens
- City pool open year-long
- Water supply

***SUMMARY OF MONTICELLO'S GROWTH OVER THE NEXT 10 YEARS***

- 78% believe the City will have more housing and businesses, expanded educational facilities, and will look better
- 52% believe that future growth requires both more businesses and a greater quantity and variety of housing
- Downtown will have numerous business and be pedestrian friendly
- A recreation center will anchor a variety of programs and events with both indoor and outdoor experiences

***SUMMARY OF CITY-HOSTED PARTICIPATION OPPORTUNITIES***

- 60% participated in City-hosted events
- 30% participated in City-hosted activities
- Most opportunities reached all age groups and many income brackets
- The most attended event was Pioneer Day
- The most attended activities were youth sports

***SUMMARY OF CITY SERVICES RANKING***

- Respondents acknowledged the connectedness of all City services
- Economic Development was the top ranked service
- City Parks & Trails ranked second
- Youth Recreation ranked third
- The lowest ranked service was Code Enforcement

***SUMMARY OF SATISFACTION WITH CITY SERVICES***

- 75% are satisfied with the services
- 34% said street and sidewalk maintenance needs to be a higher priority
- 16% want assurance that the City has sufficient water

***SUMMARY OF CITY COUNCIL MEETING ATTENDANCE***

- 55% do not attend or listen to the meetings
- 36% attended or listened to 1-4 meetings each year
- Most common reasons for not attending were too busy, lack of interest, or unaware of meeting schedule

***SUMMARY OF PREFERRED COMMUNICATION METHODS***

- 73.1% preferred more than one method
- 61.6% used the newspaper in combination with an electronic media
- 26.9% used only a single method
- 24.7% used email and social media (Facebook)
- 9.6% used the City website and local postings at the library, post office, and City office

***SUMMARY OF CITY TRANSPARENCY***

- 59.9% believe the City is transparent
- 24.6% believe the City needs to improve its transparency
- 16.2% want more frequent updates on decisions and projects

***SUMMARY OF HOUSING DEVELOPMENT***

- 62% believe Monticello has a housing shortage
- 32% believe local housing is over priced
- 53% believe private developers are the best way forward
- 44% believe the City should adjust zoning codes and fees

***HIGHLIGHTS OF ADDITIONAL COMMENTS***

- Current City administration, council, and volunteers are doing a great job
- Remember that people live here because it is small, quiet, and safe
- Hurry up with economic development and housing before we become a ghost town
- Develop a stronger sense of community
- There is always room for improvement

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**TAKE AWAYS FOR THE TRANSPORTATION ELEMENT**

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- 54% appreciate ease of access within with City
- 25% want repairs and upgrades to existing streets and sidewalks
- Emphasize pedestrian and bicycle use of City streets
- Make safer crossings on US-191 and US-491
- Plan carefully for future development to retain connectedness and safety
- Work with UDOT on uniform street lights and traffic calming devices

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**TAKE AWAYS FOR LAND USE ELEMENT**

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- Business expansion should not jeopardize the small town feel of Monticello
- Expand areas designated for residential use
- Allow a greater variety of housing for purchase and rent
- Simplify and minimize zoning and building requirements

---

**TAKE AWAYS FOR MODERATE INCOME HOUSING ELEMENT**

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- Use as many options as possible but keep citizen needs at the heart of plans
- Include incentives in ordinances
- Reduce fees where possible
- Streamline zoning and building rules to reduce barriers and speed up construction

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**TAKE AWAYS FOR WATER USE & PRESERVATION ELEMENT**

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- 9.5% made comments about water
- Only one comment about water and yards
- No one referred to existing ordinances affecting drainage, flooding, and water sources
- Small number of responses may indicate a need for education and outreach
- Residential landscaping options for low-water use will need greater emphasis

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**TAKE AWAYS FOR THE ECONOMIC DEVELOPMENT ELEMENT**

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- Expand the number and variety of locally owned businesses
- Assure housing development keeps pace with business growth
- Stimulate business-to-business communications and cooperative marketing
- Business growth needs to respect the character of the community

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**TAKE AWAYS FOR PARKS & RECREATION ELEMENT**

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- Explore financing for a recreation center
- Improve and expand trail system
- Upgrade and maintain playground equipment
- Provide recreation activities year-round
- Provide activities suitable for each age group (youngsters, children, teens, adults)
- Include activities for non-athletes

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**TAKE AWAYS FOR PUBLIC SERVICES & FACILITIES ELEMENT**

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- Plan for future growth and increased demand
- Review and adjust fees for services
- Coordinate with county sheriff for increased presence in City
- Provide more information to public on these services

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**TAKE AWAYS FOR ENERGY CONSERVATION**

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- Revise zoning ordinances to include wind turbines for home use
- Update City energy conservation plans for its buildings and vehicle fleet
- Investigate how the City can encourage energy efficient construction

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**TAKE AWAYS FOR PROVIDING INFORMATION TO THE PUBLIC**

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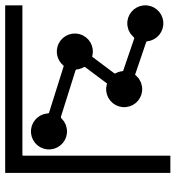
- Place a high priority on keeping the City website current
- Display agenda on Facebook in addition to the town cloud link
- Continue the multi-media methods of communicating with the public
- Gather and keep current lists of email addresses for people wanting to be contacted via email
- Consider adding processes like building permits, financial accountability, etc., to the "101" courses offered occasionally by the City and invite the public to participate

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**TAKE AWAYS FOR CITY ADMINISTRATION**

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- Provide information about implementation of City Council decisions
- Help residents better understand tracking of City revenues and expenditures
- Consider how City Council decisions will affect our small, quiet, and safe community
- Develop long-term plans for growth and the expansion of city facilities



*An Analysis Of The*

## COMMUNITY GENERAL PLAN SURVEY

*City Of Monticello, Utah*

Between October 2025 and February 2026 the City of Monticello conducted a survey to obtain information useful in preparing their general plan. City staff and the City Council determined the survey would solicit demographic information, perspectives on the community and its future outlook, how the respondents interacted with the City and if city services met their needs, how frequently participants attended or listened to City Council meetings, the media used by respondents to learn about City activities, and whether participants believed there was a housing shortage in the city and what might be done to address it.

Survey data were captured online via a survey link on the City's website and by hardcopy responses. The latter were manually entered into the survey database by City staff. The data were automatically time stamped and an identification number assigned by the software. Survey responses were output as a comma-separated values spreadsheet (CSV) which was subsequently uploaded to a FileMaker Pro database for the analysis. The completed database contained 68 fields and 219 records.

The 2027 General Plan currently under development has eight topics, called elements, three of which are required by Utah law and the others were selected by City Council as topics important to residents. In addition, there are specific requirements for notifying the public about the plan and how they can provide comments and suggestions. The survey provided information useful in describing and addressing the elements and revealed how respondents preferred to receive communications from the City.

**TENTATIVE CORRELATION OF SURVEY QUESTIONS WITH 2027 GENERAL PLAN REQUIREMENTS**

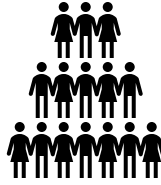
<b>2027 General Plan requirements</b>	<b>Applicable survey questions</b>
Economic Development	Q3, Q4, Q5, Q7; Comments in several questions
Energy Conservation	Comments in several questions
Land Use	Q1, Q2, Q3, Q4; Comments in several questions
Moderate Income Housing	Q15, Q16, Q17; Comments in several questions
Parks & Recreation	Q1, Q2, Q6, Q7; Comments in several questions
Public Notification	Q11, Q12, Q13, Q14
Public Services & Facilities	Q7, Q8, Q9, Q10; Comments in several questions
Transportation network	Comments in several questions
Water Use & Preservation	Comments in several questions

The survey included eleven questions where written comments, suggestions, and concerns could be included. Many of the respondents addressed multiple topics that were not congruent with a specific question but which contained useful information. Therefore, the comments are analyzed in separate sections organized by plan elements rather than the questions that prompted the

responses. Some comments asked the City to undertake actions that Utah law might preclude, but such comments were included because they provide City administrators with a better understanding of what respondents want and where the City might better communicate its limits and processes.

The analysis examined responses to survey questions, displayed data in charts and tables, and summarized the primary results for the questions. The analysis then examined survey results as they pertained to the elements in the 2027 General Plan, including some specific comments, suggestions, and cautions provided by survey respondents.

Prepared by  
Lee A. Bennett  
Bennett Management Services, LLC  
Monticello, UT  
February 25, 2026



## DEMOGRAPHIC INFORMATION

To put survey data into local perspective, census-based data projections were used to compare with survey responses pertinent to demographics. The high percentage of young people reflected the City's effort to ensure that the ideas of future City residents was considered.

### SURVEY CONGRUENCE WITH CENSUS-BASED PROJECTIONS FOR MONTICELLO

Attribute	Census-based <sup>1</sup>	Survey data	Survey Congruence
Population	1,757	219	12% representation
Median age	37.6 years	45.5 years estimated	About 8 years older
Aged 65 and older	107	43	Age brackets not a good match
Aged 18-64 years	61	168	Age brackets not a good match
Avg Household size	2.9	About 2	Slightly smaller
Median income	\$30,445	\$61,000 estimated	About \$30k higher
Gender	Approximately equal	29% male, 40% female, 30% not reported	Uncertain
Race	97% white	Not included	Unknown

### SURVEY RESPONSES BY AGE GROUP AND GENDER

Age Group	Males	Females	Prefer Not to Say	% Responses
14-25	2	3	58	28.8
26-35	14	17	0	14.2
36-45	13	25	1	17.8
46-55	11	13	1	11.4
56-65	5	10	2	7.8
66-75	8	10	1	8.7
76 +	11	11	3	11.4
<b>% Responses</b>	29.2	40.6	30.1	

Many people find it easier to think of age in terms of popular generational categories like "Baby Boomer" and "Gen X." The city age groups were not an exact correlation with the generational labels, but based on the equivalencies shown in the table below, selected survey results were examined for the effect that participant age might have had on responses.

### GENERATIONAL EQUIVALENTS OF CITY AGE GROUPS

Generation Group	City Age Group	Respondents	% Respondents
Gen Z 14-29 yrs	14-25 yrs	63	28.8
Millennials 30-45 yrs	26-35 & 36-45 yrs	70	32.0
Gen X 46-61 yrs	46-55 & 56-65 yrs	42	19.2
Baby Boomer 62-80 yrs	66-75 & 76 + yrs	44	20.1

<sup>1</sup> <https://datacommons.org/place/geold/4951580>

**HOUSEHOLD SIZE BY GENERATION**

Household Size	Baby Boomers	Gen X	Millennials	Gen Z	% total
1-2 people	43	22	16	58	63.5
3-4 people	1	11	19	4	16.0
5-6 people	0	7	30	1	17.4
7-8 people	0	2	4	0	2.7
9 + people	0	0	1	0	0.5

Survey participants were asked to select the range in which their annual household income fell. The survey did not define household. Because any individual could complete the survey some households may have submitted more than one survey.

**RESPONSES BY HOUSEHOLD INCOME AND GENDER**

Income (dollars)	Males	Females	Prefer Not to Say	% Responses
0-21,000	10	10	59	36.1
22,000-31,000	2	9	2	5.9
32,000-41,000	6	7	1	6.4
42,000-51,000	3	6	1	4.6
52,000-61,000	3	6	0	4.1
62,000-71,000	6	6	1	5.9
72,000-81,000	4	4	0	3.7
82,000-91,000	7	12	1	9.1
92,000-101,000	7	10	0	7.8
102,000-111,000	3	4	0	3.2
112,000-121,000	2	1	0	1.4
122,000 +	11	13	0	11.0

**HOUSEHOLD INCOME BY SIZE OF HOUSEHOLD**

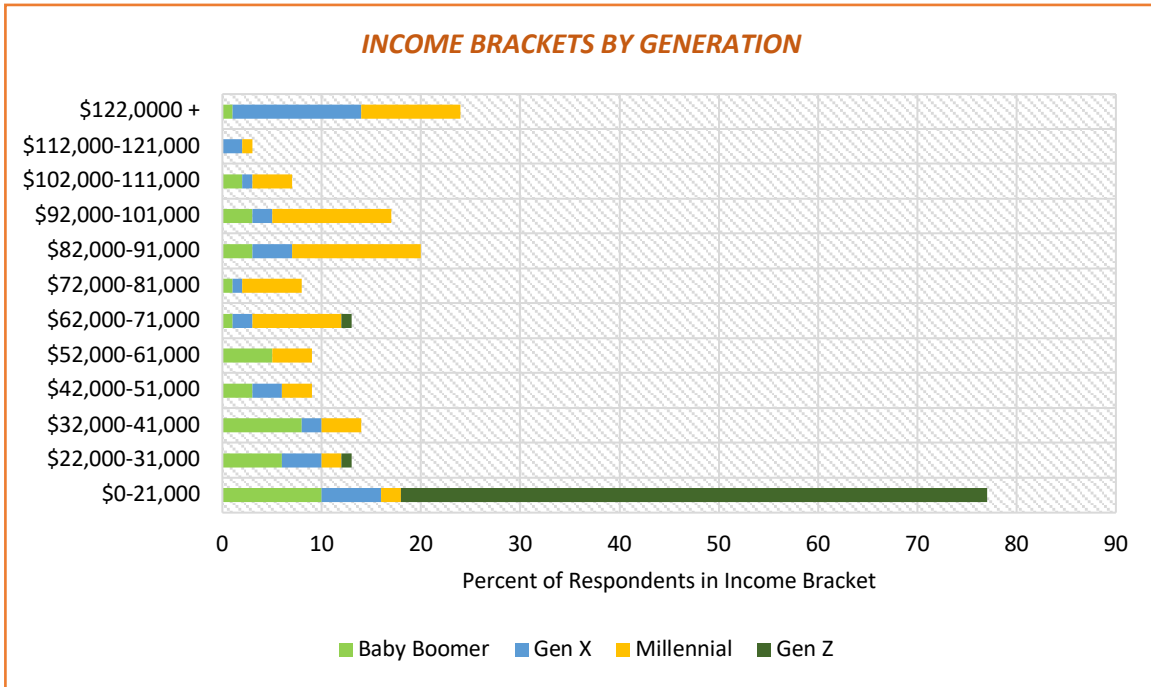
Income (dollars)	1-2	3-4	5-6	7-8	9+
0-21,000	74	4	1	0	0
22,000-31,000	10	2	1	0	0
32,000-41,000	9	1	3	0	1
42,000-51,000	6	1	2	1	0
52,000-61,000	6	1	2	0	0
62,000-71,000	3	4	6	0	0
72,000-81,000	4	0	4	0	0
82,000-91,000	5	9	4	2	0
92,000-101,000	6	4	6	1	0
102,000-111,000	4	2	1	0	0
112,000-121,000	0	3	0	0	0
122,000 +	10	4	8	2	0

The majority of the respondents in the \$0-21,000 income bracket were also in the 14-25 year age group, suggesting that this income bracket included a number of school-age students. Student responses may or may not reflect actual household income.

**RESPONSES BY AGE GROUP AND HOUSEHOLD INCOME**

Income (dollars)	14-25	26-35	36-45	46-55	56-65	66-75	76 +
0-21,000	59	1	1	1	5	2	8
22,000-31,000	1	1	1	1	3	2	4
32,000-41,000	0	0	4	2	0	2	6
42,000-51,000	0	1	2	2	1	2	1
52,000-61,000	0	2	2	0	0	3	2
62,000-71,000	1	3	6	2	0	1	0
72,000-81,000	0	3	3	1	0	0	1
82,000-91,000	0	6	7	4	0	2	1
92,000-101,000	0	5	7	1	1	3	0
102,000-111,000	0	3	1	1	0	1	1
112,000-121,000	0	1	0	2	0	0	0
122,000 +	0	5	5	8	5	1	0

As noted above, a large number of young people who participated in the survey and probably overwhelmed the lowest income bracket.



The survey asked respondents to indicate whether they lived full-time in Monticello, were seasonal residents of the City, or lived in the county but were vested in the City.

**PLACE OF RESIDENCE BY HOUSEHOLD INCOME**

Income (dollars)	Full-Time City Resident	Seasonal City Resident	County Resident
0-21,000	67	0	13
22,000-31,000	11	0	2
32,000-41,000	12	0	2
42,000-51,000	7	0	3
52,000-61,000	9	0	0

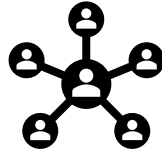
<b>62,000-71,000</b>	12	1	0
<b>72,000-81,000</b>	8	0	0
<b>82,000-91,000</b>	17	1	2
<b>92,000-101,000</b>	14	2	2
<b>102,000-111,000</b>	6	1	0
<b>112,000-121,000</b>	3	0	0
<b>122,000 +</b>	23	1	0
<b>% Responses</b>	86.3	2.7	11.0

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### ***SUMMARY OF DEMOGRAPHIC INFORMATION***

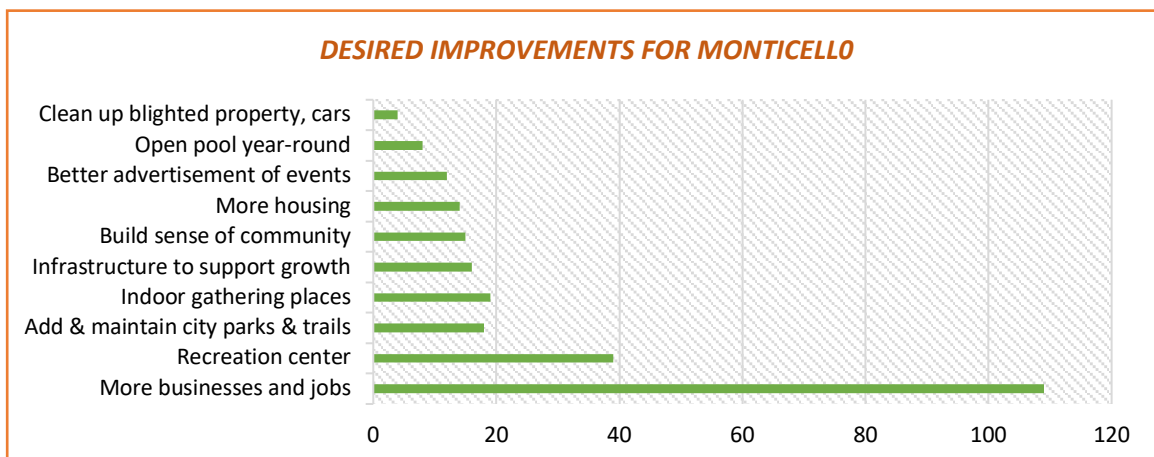
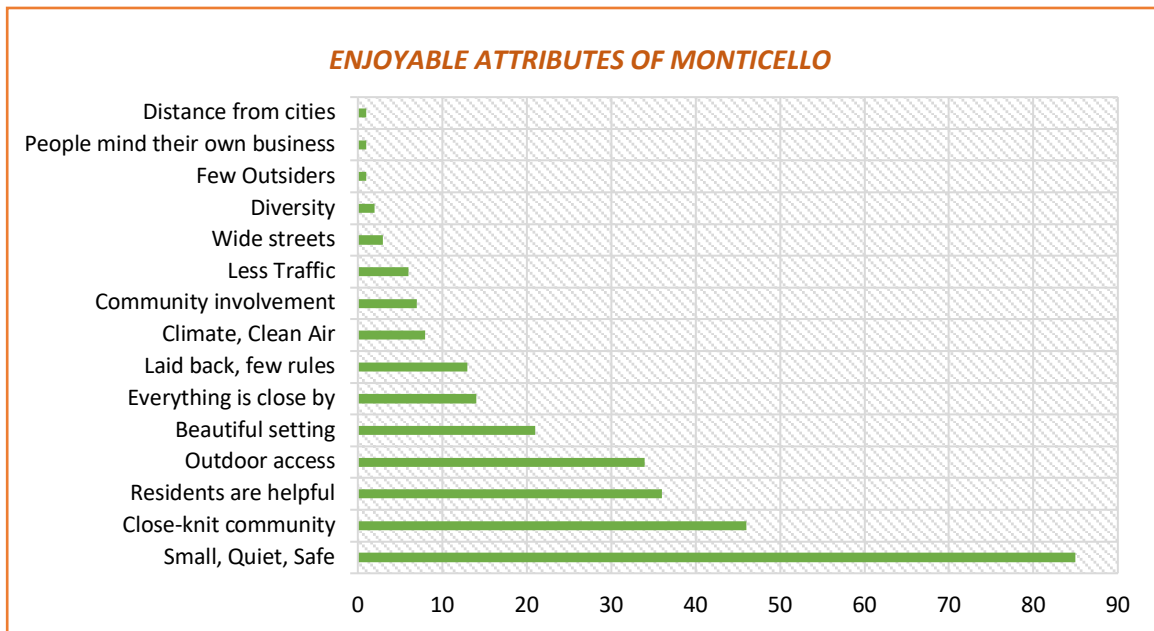
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- *219 survey responses were received*
- *100% of the surveys contained the requested demographic information*
- *86.3% of the respondents lived full-time in Monticello*
- *63.4% of respondents live in a household of 1 to 2 people*
- *29.2% of the respondents were male, 40.6% female*
- *30.1% preferred not to identify their gender, most of whom were between 14-25 years of age and were probably school students*
- *The large number of students in the 14-25 year age group probably skewed the \$0-21,000 income bracket*



## WHAT PEOPLE ENJOY OR MISS IN MONTICELLO (Q1 & Q2)

About 91.5% of the surveys contained responses to what was enjoyable about Monticello (Q1), and 89% of the surveys contained comments about what the community is missing (Q2). Instead of a list of negatives, the majority of respondents named specific things, events, or services they would like to see added to the community

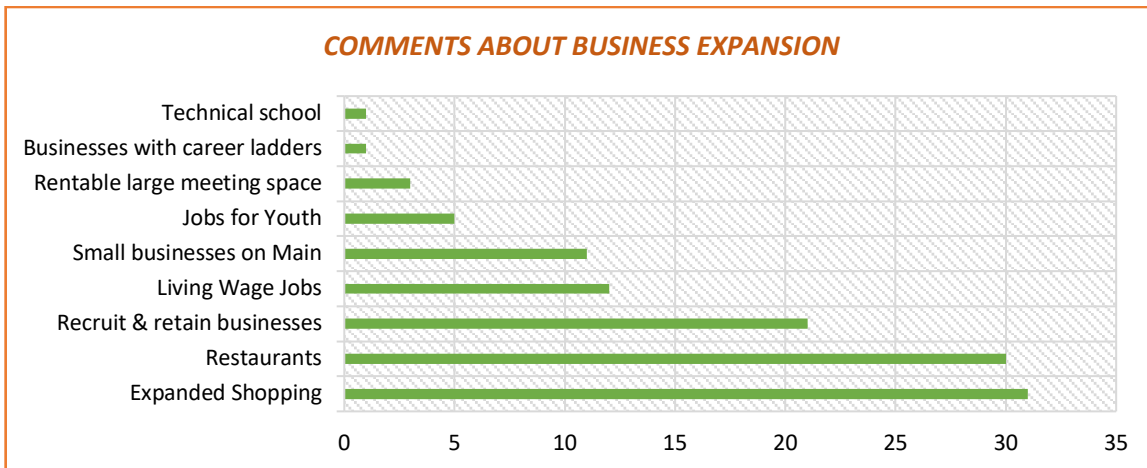


**GENERATIONAL RESPONSES TO MONTICELLO LIKES AND DISLIKES**

Generation Group	Most Enjoy	Most Want
Gen Z	Close-knit community; Events	Businesses; Fast food restaurants
Millennials	City is small, quiet, safe; Close-knit community	Recreation center; Businesses
Gen X	Outdoor access; City is small, quiet, safe	Recreation center; Sense of community; Businesses
Baby Boomers	City is small, quiet, safe	Jobs; Businesses; Community pride

Because business expansion and a recreation center were dominant themes in participant comments about what the City needs, summaries are provided below. As a points of reference, shopping locally keeps money in the community for a longer period of time when compared with chain stores, and simultaneously contributes to the local tax base by returning the sales tax in the community. For each \$100 spent in a local business, about \$52 recirculates through the community compared with less than 14% for a national chain store. Local businesses are more likely than chain stores to contribute to community projects and events, support local artists and makers, and they tend to offer better customer service. Local shops are closer to home so there is a smaller carbon footprint for local shoppers.<sup>2</sup> A living wage in San Juan County for a household with two adults both working and two children was \$42.66 per hour; poverty wage was \$15.46 per hour.<sup>3</sup> In 2025 the average hourly wage in San Juan County was \$24.33 for a full-time worker.<sup>4</sup>

Participants interested in expanding the number and variety of businesses in Monticello represented 73% of survey respondents. Participants came from all income brackets, including 18% aged 14-25 years in the \$0-21,000 bracket, who may have been students.



<sup>2</sup> "Tis the Season to Shop Local: How You Can Support Your Community," First Utah Bank at <https://firstutahbank.com/tis-the-season-to-shop-local/>; "Indie Impact Study Series: A National Comparative Survey with the American Booksellers Association," 2012, viewed at chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://nebula.wsimg.com/09d4a3747498c7e97b42657484cae80d?AccessKeyId=8E410A17553441C49302&disposition=0&alloworigin=1

<sup>3</sup> "Living Wage Calculation for San Juan County, Utah," viewed at <https://livingwage.mit.edu/counties/49037>

<sup>4</sup> "Average weekly wages by county in Utah, first quarter 2025," viewed at [https://www.bls.gov/regions/mountain-plains/news-release/countyemploymentandwages\\_utah.htm](https://www.bls.gov/regions/mountain-plains/news-release/countyemploymentandwages_utah.htm)

Several participants (13%) wanted a recreation center that was ADA compliant and affordable for community residents. Respondents wanted places for their children to gather and believed a recreation center would best fulfill that need.

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### ***SUMMARY OF REASONS TO LIKE MONTICELLO***

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- *38% appreciate the small, close-knit, quiet and safe feel of the community*
- *It is easy to get to outdoor recreation and the setting is beautiful*
- *City has good parks, trails, golf course, and Loyd's Lake*
- *City hosts public programs and events and people are supportive of them*

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### ***SUMMARY OF WHAT MONTICELLO NEEDS***

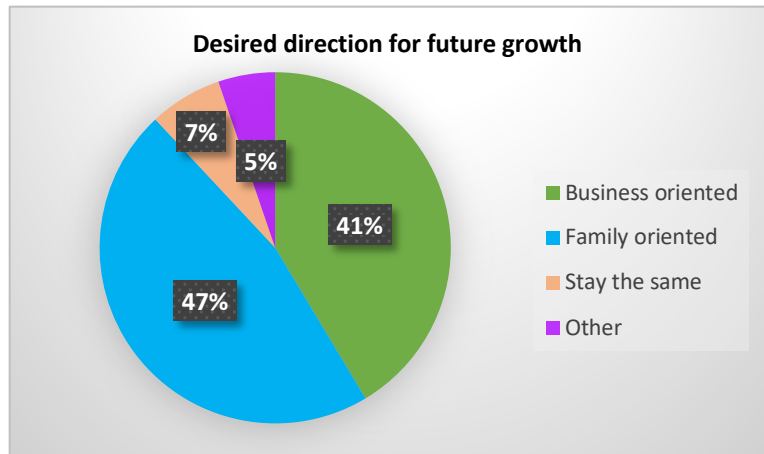
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- *30% or more want more businesses in Monticello*
- *11% want an affordable recreation center*
- *Improve community pride and invite everyone*
- *6% want more and upgraded City parks, trails, and playgrounds*
- *More activities for all age groups, but especially teens*
- *City pool open year-long*
- *Water supply*



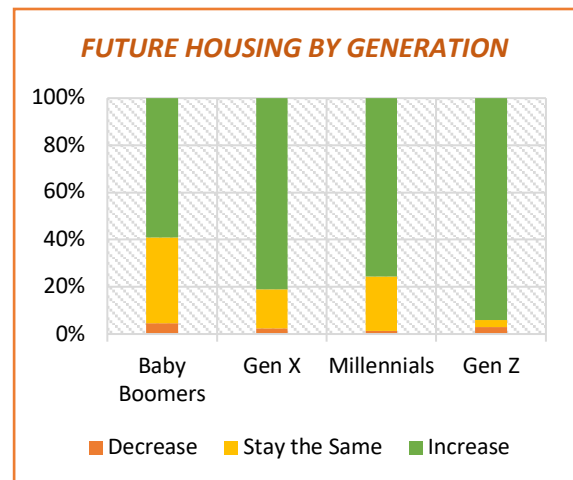
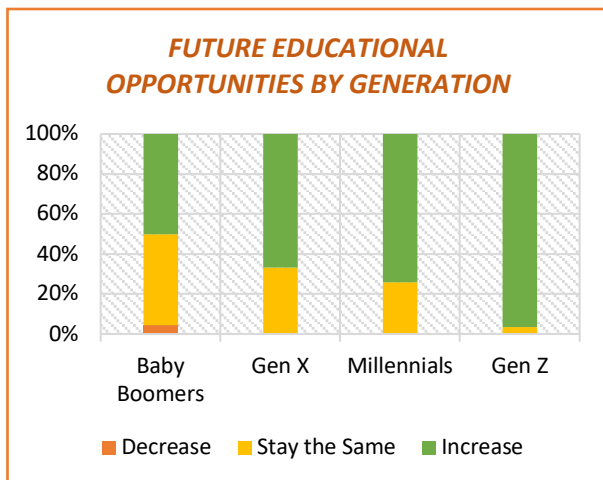
## TRANSFORMATION OVER THE NEXT 10 YEARS (Q3, Q4 & Q5)

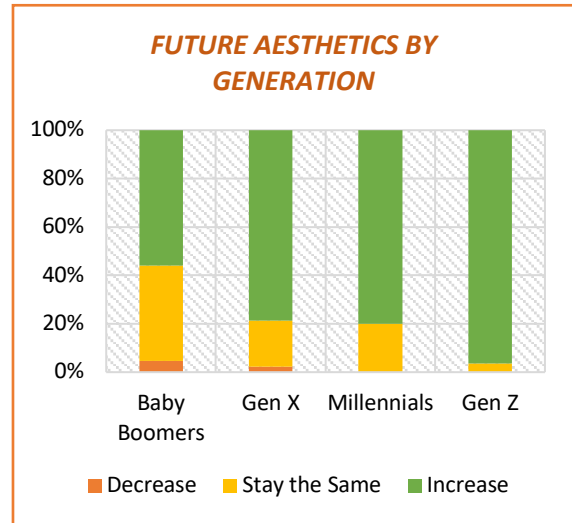
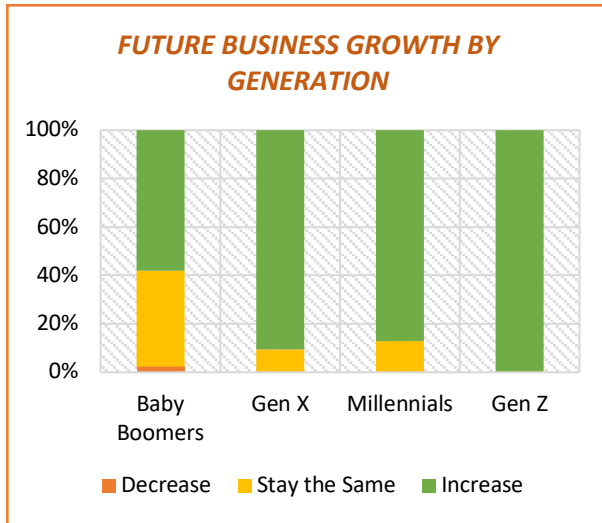
About 78% of respondents anticipated growth or improvement in all four categories. Respondents slightly favored an emphasis on family oriented future growth over business oriented growth. The difference was only 12 responses. However, 50.7% of the respondents wanted both business and family oriented growth.



About 8% of the respondents wrote comments about the direction of future growth. Participants who believed growth would involve changes other than the four listed in the survey zeroed in on building a recreation center, increasing traffic on US-191 and US-491, expanding recreation activities, assuring that all groups in the city were represented by a diverse City Council, securing water for Monticello's future, and assuring that City infrastructure was prepared for growth.

When responses were viewed by generation, some differences in the "stay the same" and "decrease" numbers were evident, although the results were still dominated by "increase" in the four categories.





The hesitancy evident in the Baby Boomer generation was not explained in the comments. Hence, it is uncertain whether they have been disappointed by past City promises and plans, or are skeptical about the pace of improvement.

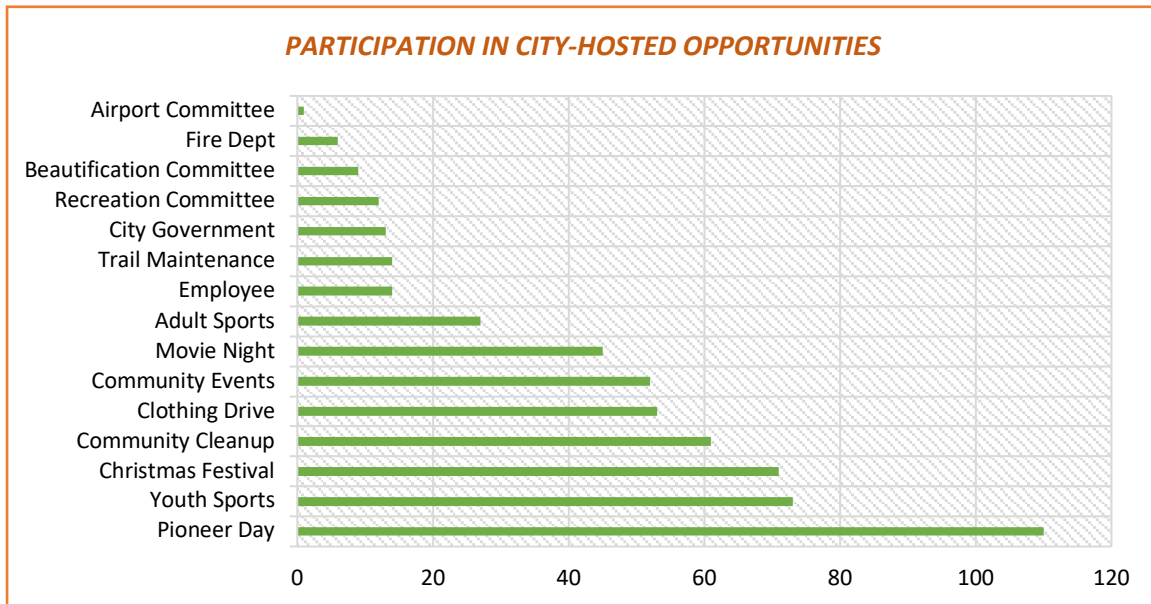
***SUMMARY OF MONTICELLO'S GROWTH OVER THE NEXT 10 YEARS***

- *78% believe the City will have more housing and businesses, expanded educational facilities, and will look better*
- *52% believe that future growth requires both more businesses and a greater quantity and variety of housing*
- *Downtown will have numerous business and be pedestrian friendly*
- *A recreation center will anchor a variety of programs and events with both indoor and outdoor experiences*



## PARTICIPATION IN CITY-HOSTED OPPORTUNITIES (Q6)

City-hosted events were the most common way that survey respondents were involved with the City. The survey did not distinguish between those who attended an event and those who helped with its planning and logistics. Two of the survey participants indicated a desire to volunteer for the City but did not know how to find out about such opportunities.



About 12% of the respondents participated in other ways, and some of the participants were engaged with groups not hosted by the City. Inclusion of non-city groups in the survey suggested that respondents felt their time benefitted the City, thought the City sponsored the event, or were simply accounting for their voluntary civic duties.

### OTHER PARTICIPATION

Search and Rescue	SJCPAC working group	Lions Club
Library	Rodeo	Bike riding group
4H Fair	Grocery shopping	Old man's basketball
Rotary Club		

Participation varied by generation as seen in the following table. Ratios of participation<sup>5</sup> show the outstanding commitments made by Gen X and Millennials to the City's volunteer opportunities. On the other hand, it may validate the observation of a few respondents who noted that "the same 10 people" were doing everything for the City and there needed to be a greater level of involvement by the community.

**PARTICIPATION IN SELECTED OPPORTUNITIES BY GENERATION**

<b>Opportunity</b>	<b>Baby Boomers</b>	<b>Gen X</b>	<b>Millennials</b>	<b>Gen Z</b>
<b>Christmas Festival</b>	8	14	25	24
<b>City Cleanup</b>	9	10	23	19
<b>Clothing Drive</b>	10	9	26	8
<b>Community Events</b>	7	15	28	2
<b>Pioneer Days</b>	16	22	41	31
<b>Trail Maintenance</b>	1	3	8	2
<b>Youth Sports</b>	3	8	41	20
<b>Totals</b>	54	81	192	106
<b>Participation Ratio</b>	1:1.2	1:1.9	1:2.4	1:1.7

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***SUMMARY OF CITY-HOSTED PARTICIPATION OPPORTUNITIES***

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- *60% participated in City-hosted events*
- *30% participated in City-hosted activities*
- *Most opportunities reached all age groups and many income brackets*
- *The most attended event was Pioneer Day*
- *The most attended activities were youth sports*

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<sup>5</sup> Calculated by dividing the number of volunteers in each generation by the number of survey respondents in that generation. Thus, a ratio of 2:1 means the for every survey respondent of that generation, two members of the same generation volunteered for city opportunities.



## RANKING OF CITY SERVICES (Q3, Q4 & Q5)

Survey respondents were asked to rank 10 services provided by Monticello City on a 1-10 scale, with 1 being most important. This question was a personal ranking, meaning important to the respondent and not to others or the community. From comments it was apparent that many participants considered their families and not just themselves.

Economic Development was the highest ranked City service and comments confirmed that participants recognized Monticello would struggle without some boost to its economy. In the words of one respondent, "No money means nothing else happens and Monticello will be a ghost town." The overall ranking for City services was:

- |                        |                    |                     |                     |
|------------------------|--------------------|---------------------|---------------------|
| 1 Economic Development | 4 Community Events | 7 Landfill Services | 10 Code Enforcement |
| 2 City Parks & Trails  | 5 Tourism          | 8 Golf Course       |                     |
| 3 Youth Recreation     | 6 City Pool        | 9 Adult Recreation  |                     |

### RANKING OF CITY SERVICES

Service/Rank	1	2	3	4	5	6	7	8	9	10
<b>Adult Recreation</b>	6	16	13	31	25	33	26	25	22	15
<b>City Parks &amp; Trails</b>	30	36	44	31	31	8	16	13	3	0
<b>City Pool</b>	9	21	17	20	21	26	17	23	38	24
<b>Code Enforcement</b>	13	12	5	15	11	15	23	40	42	39
<b>Community Events</b>	11	30	24	28	25	31	22	22	13	9
<b>Economic Development</b>	71	28	14	19	19	19	22	10	9	4
<b>Golf Course</b>	16	9	20	14	23	12	16	20	21	63
<b>Landfill Services</b>	10	12	23	11	18	34	29	26	34	16
<b>Tourism</b>	13	15	24	15	11	16	28	26	23	43
<b>Youth Recreation</b>	35	35	30	30	30	20	15	9	9	1

Age and income affected how City services were ranked by respondents. The tables below compared the top three ranked services.

**AGE INFLUENCE ON RANKING OF CITY SERVICES**

	Rank 1	Rank 2	Rank 3
<b>Gen Z</b>	City Parks & Trails	Youth Recreation	Economic Development
<b>Millennials</b>	Youth Recreation	Economic Development	City Parks & Trails
<b>Gen X</b>	Economic Development	City Parks & Trails	Community Events
<b>Baby Boomers</b>	Economic Development	Tourism	City Parks & Trails

**INCOME INFLUENCE ON RANKING OF CITY SERVICES**

	Rank 1	Rank 2	Rank 3
<b>\$0-21,000</b>	City Parks & Trails	Youth Recreation	Economic Development
<b>\$22,000-31,000</b>	City Parks & Trails	Economic Development	Youth Recreation
<b>\$32,000-41,000</b>	Economic Development	Tourism	Code Enforcement
<b>\$42,000-51,000</b>	Economic Development	Youth Recreation	Landfill Services
<b>\$52,000-61,000</b>	Economic Development	Youth Recreation	Community Events
<b>\$62,000-71,000</b>	Economic Development	City Parks & Trails	Youth Recreation
<b>\$72,000-81,000</b>	Youth Recreation	Economic Development	Adult Recreation
<b>\$82,000-91,000</b>	Youth Recreation	Economic Development	City Parks & Trails
<b>\$92,000-101,000</b>	City Parks & Trails	Youth Recreation	Community Events
<b>\$102,000-111,000</b>	City Parks & Trails	Economic Development	Youth Recreation
<b>\$112,000-121,000</b>	Economic Development	Tourism	City Parks & Trails
<b>\$122,000 +</b>	Economic Development	Tourism	Youth Recreation

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***SUMMARY OF CITY SERVICES RANKING***

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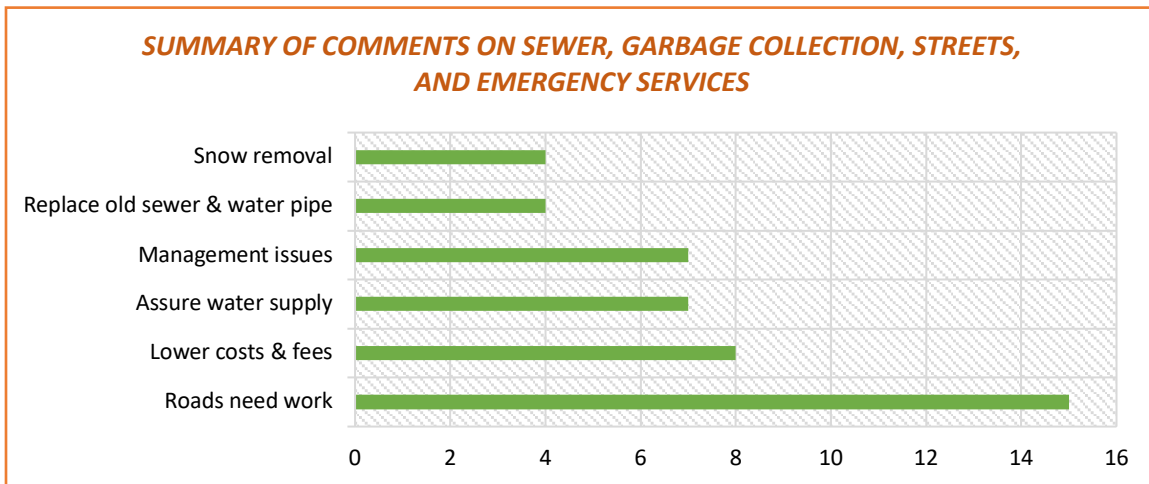
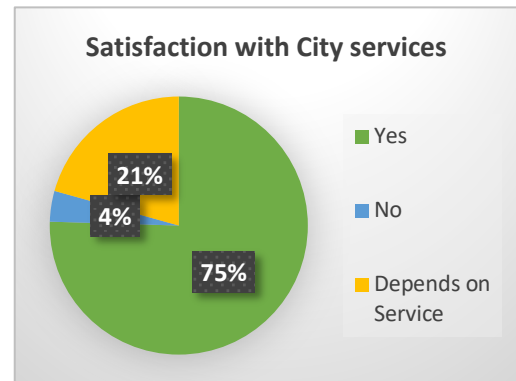
- Respondents acknowledged the connectedness of all City services
- Economic Development was the top ranked service
- City Parks & Trails ranked second
- Youth Recreation ranked third
- The lowest ranked service was Code Enforcement



## SATISFACTION WITH SEWER, GARBAGE COLLECTION, STREETS, AND EMERGENCY SERVICES (Q9 & Q10)

Satisfaction was reported by 76% of respondents representing all age groups and income brackets. About 9.5% of the participants lived outside of Monticello but responded to the questions nonetheless, confirming that Monticello is a focal point. Respondents who were not satisfied with the services included 5 City residents and 3 county residents.

Concerns and suggestions were provided by 44 respondents and are summarized in the chart below.



### SUMMARY OF SATISFACTION WITH CITY SERVICES

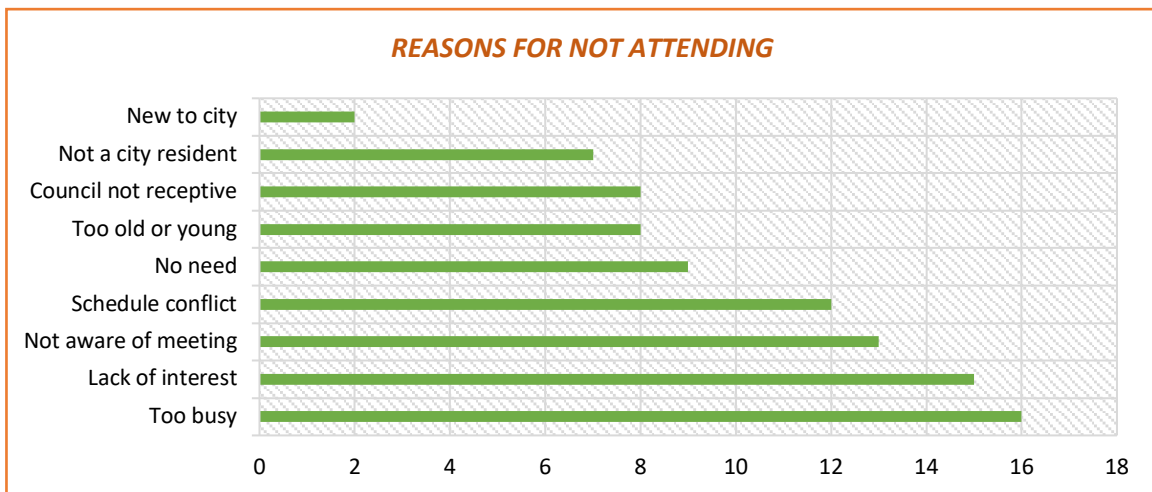
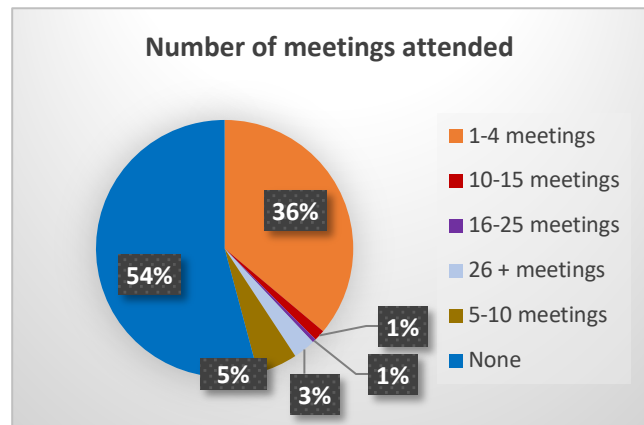
- 75% are satisfied with the services
- 34% said street and sidewalk maintenance needs to be a higher priority
- 16% want assurance that the City has sufficient water



## ATTENDANCE AT CITY COUNCIL MEETINGS (Q11 & Q12)

Participants were asked how many City Council meetings they attended or listened to each year (Q11). If they had not attend or listened during a year, Q12 asked them to explain. About 2% of respondents did not reply to these questions.

Explanations for not attending or listening to City Council meetings were provided by 41% of the respondents and are summarized in the chart below.



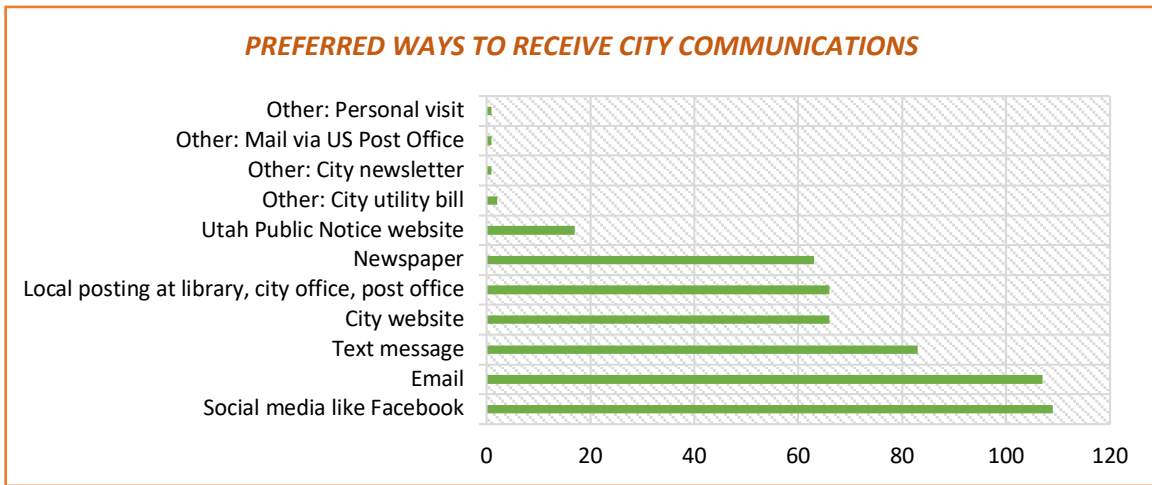
### ***SUMMARY OF CITY COUNCIL MEETING ATTENDANCE***

- *55% do not attend or listen to the meetings*
- *36% attended or listened to 1-4 meetings each year*
- *Most common reasons for not attending were too busy, lack of interest, or unaware of meeting schedule*



## PREFERRED METHOD OF RECEIVING INFORMATION (Q13)

Choices included five electronic methods, two hardcopy methods, and an option for the respondent to write in another method. About 67.3% of participants preferred more than one method of receiving information from the City. Responses differed by generation as shown in the table below.



### PREFERRED METHOD BY GENERATION

	Email	Text	Social Media	City Website	Local posting	UT public notice	Newspaper	Other
<b>Gen Z</b>	14	16	42	20	15	2	4	0
<b>Millennials</b>	47	34	35	22	22	7	21	0
<b>Gen X</b>	22	15	21	14	12	5	12	2
<b>Baby Boomers</b>	24	18	11	10	17	3	23	3
<b>Totals</b>	107	83	109	66	66	17	60	5

One respondent inquired when the City would broadcast meetings online and noted that it would help citizens be more involved and knowledgeable.

A combination of preferences were reported by many respondents, with 2 or 3 methods the most common. Combinations of communication methods are shown on the matrix below. Where the preference is the same on the row and column on the matrix below, that indicates the respondents had only that single preference.

**MATRIX OF MEDIA PREFERENCES**

	Email	Text	Social Media	City Website	Local posting	UT public notice	Newspaper	Other
Email	12	49	54	32	30	11	33	0
Text	49	7	39	24	25	4	23	0
Social Media	54	39	18	42	31	6	30	1
City Website	32	24	42	9	21	9	21	1
Local posting	30	25	31	21	5	11	28	1
UT Public Notice	11	4	6	9	11	1	7	0
Newspaper	33	23	30	21	28	7	4	2
Other	0	0	1	1	1	0	2	3

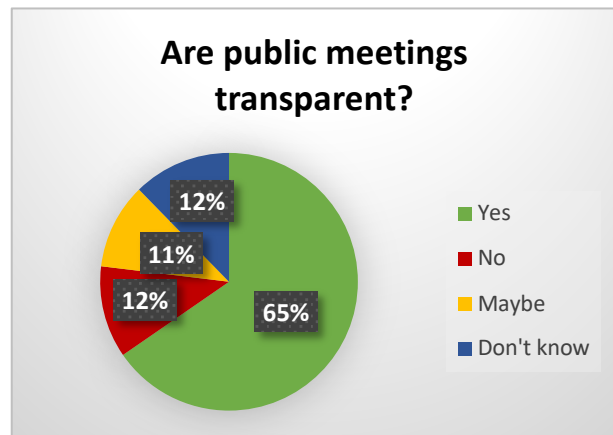
***SUMMARY OF PREFERRED COMMUNICATION METHODS***

- 73.1% preferred more than one method
- 61.6% used the newspaper in combination with an electronic media
- 26.9% used only a single method
- 24.7% used email and social media (Facebook)
- 9.6% used the City website and local postings at the library, post office, and City office



## TRANSPARENCY OF PUBLIC MEETINGS AND ACTIONS (Q14)

Most respondents thought the City meetings were transparent although some commented that they had to work to find information. A few noted that the City Council and Planning Commission were transparent but other committees were not. One respondent seemed to encapsulate the concern of several who said "no" or "maybe" to the question. The individual wrote, "They meet the lawful requirements, but that does not mean they are giving the needed attention...[When] meeting materials are sent out very close to the meeting time, it does not give the public sufficient time to study and look for issues they would like addressed at the meeting. If the council members are getting that material that late, how can they come prepared to discuss the issues? And if they are getting it earlier, the public should also."



About 13% of respondents recommended ways the City could communicate better, although the majority of their suggestions have been in actual use for a year or longer. Respondents observed that if they don't use social media, read the newspaper, or call the City, they don't know what is going on. One concluded, "It's just the average person doesn't know where or how to access anything that is posted. Also the web page isn't well maintained." Some acknowledged they may not be putting in enough effort themselves to be informed. Participants also wanted to receive updates on projects and implementation of decisions, and in general would like to know more about how the City functions.

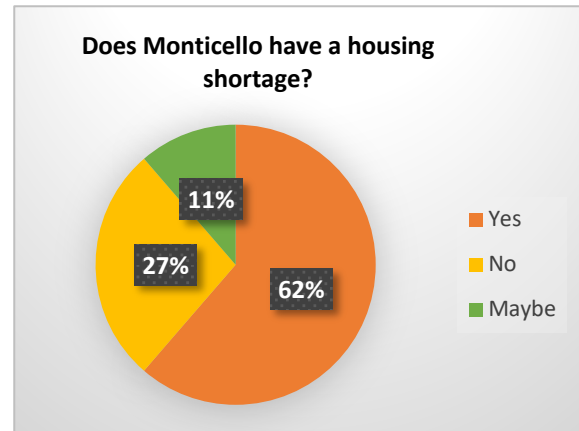
### ***SUMMARY OF CITY TRANSPARENCY***

- 59.9% believe the City is transparent
- 24.6% believe the City needs to improve its transparency
- 16.2% want more frequent updates on decisions and projects

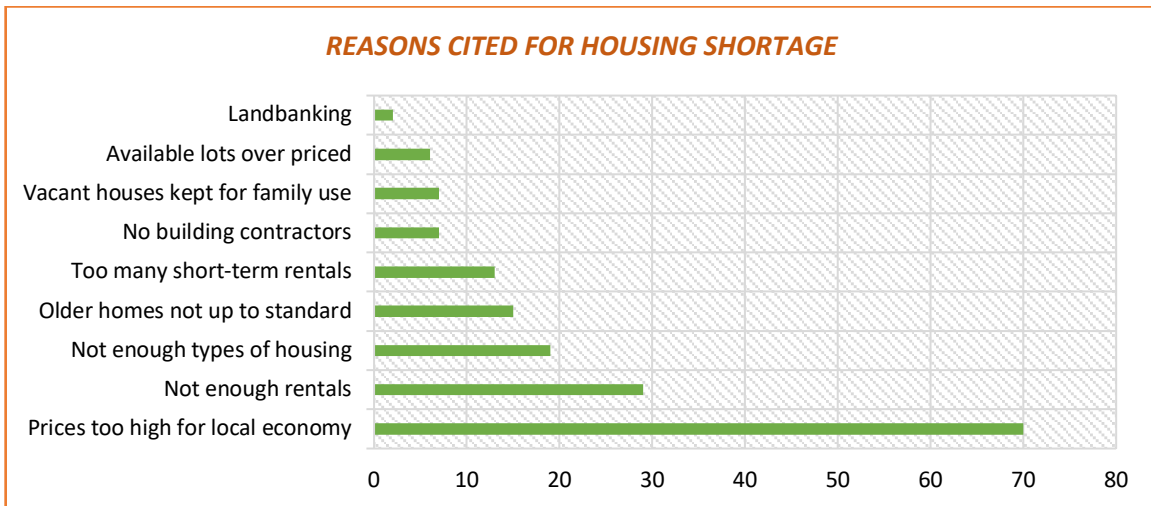


## HOUSING SHORTAGE (Q15, Q16, Q17)

Most respondents believed there was a housing shortage in Monticello. As a point of reference, census-based data show that Monticello had 732 housing units in 2023, 18 of which were constructed in 2010 or later, 357 were built between 1950-1989, and 80 were built prior to 1940.<sup>6</sup> On Feb 15, 2026 there were 11-13 homes for sale in Monticello priced from \$249,000 to \$460,000, two undeveloped lots, and 4 rentals from \$795 to \$955.

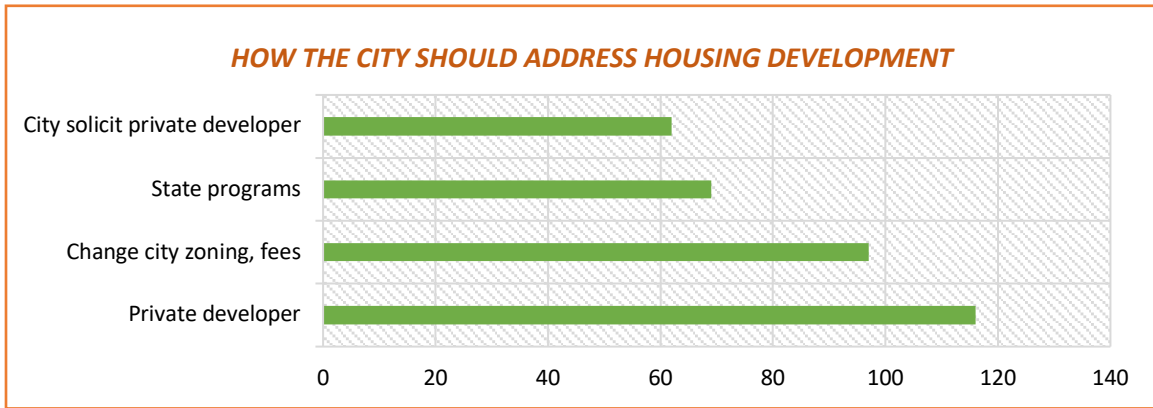


Comments about the housing situation highlighted several issues. At least one respondent believed that Monticello's limited water supply will retard housing development and another stated that good paying jobs have to be created before anyone can afford available houses.



Participants preferred that the housing situation be addressed by private developers and through City adjustments to building codes and fees. Several respondents suggested the use of incentives to encourage developers to come to the area.

<sup>6</sup> <https://datacommons.org/place/geold/4951580?q=Monticello%2C+Utah%2C+USA>



Respondents cautioned that private developers must consider local needs first and not build housing that only serves the desires of the wealthy. Multi-family housing over single-family units was highlighted. No respondents suggested that new businesses should construct housing for their employees, a stipulation seen in a neighboring community.

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***SUMMARY OF HOUSING DEVELOPMENT***

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- *62% believe Monticello has a housing shortage*
- *32% believe local housing is over priced*
- *53% believe private developers are the best way forward*
- *44% believe the City should adjust zoning codes and fees*



## ADDITIONAL COMMENTS (Q18)

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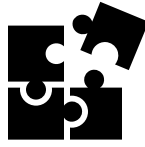
This write-in question provided participants with one last opportunity to express themselves about Monticello. About 27.9% of respondents provided additional opinions and suggestions. These are incorporated into the following sections that discuss general plan elements.

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### ***HIGHLIGHTS OF ADDITIONAL COMMENTS***

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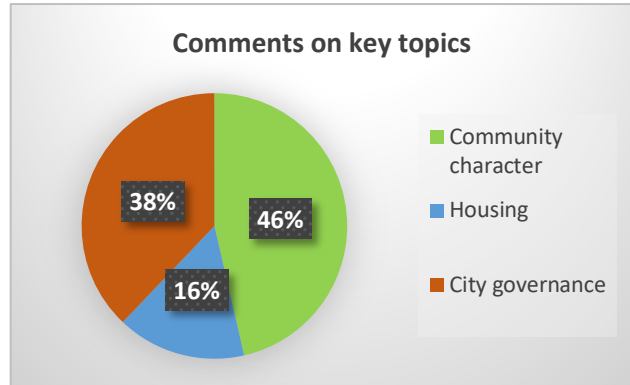
- *Current City administration, council, and volunteers are doing a great job*
- *Remember that people live here because it is small, quiet, and safe*
- *Hurry up with economic development and housing before we become a ghost town*
- *Develop a stronger sense of community*
- *There is always room for improvement*



## WRITTEN COMMENTS AND THE GENERAL PLAN

Respondents made many comments on the survey. The majority of the respondents commented on things that make living in Monticello both a pleasure and a challenge.

Because the written remarks often included information beyond the scope of a specific question, comments were examined independent of the question and grouped according to the elements of the 2027 General Plan.



### NUMBER OF COMMENTS BY SURVEY QUESTION

Questions	Responses
1 What do you enjoy about our community?	202
2 What do you feel is missing from our community?	197
4 List other areas of change over the next 10 years	61
5 What other directions of growth would you like to see?	18
6 What other ways do you regularly participate in volunteer opportunities hosted by Monticello City?	18
7 Why did you select your top three City services?	173
10 What improvements would you like to see in City sewer, garbage collection, streets, and emergency services?	45
12 If you do not attend City Council meetings, why?	90
14 Why do you feel the City is transparent or not transparent regarding all public meetings and actions?	148
16 Why do you feel the City has or does not have a housing shortage?	136
17 What other ways should the City address housing development?	28
18 Do you have any additional comments?	61

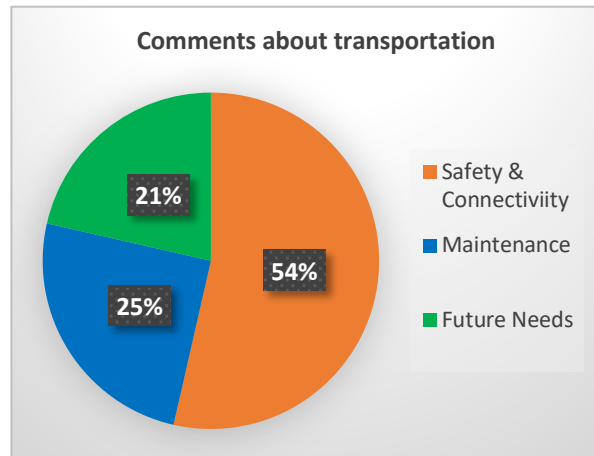
With 219 responses to the City survey, a comment made by one person represented 0.5% of the survey results. To represent 51% or more of the survey, comments were needed from 112 respondents.



## TRANSPORTATION ELEMENT

In addition to specific comments about the transportation network noted below, participants emphasized the small, quiet, and safe character of the community. At the same time most wanted to see more businesses in town and more permanent residents. The tension between these two critical needs may challenge transportation planning.

Comments were made about maintenance, safety and connectivity, and future improvements. Income did not seem to be a distinguishing factor among the comments, but Gen Z participants made fewer comments than other generations.



### COMMENTS PERTINENT TO THE TRANSPORTATION ELEMENT

Comment	Frequency
Repair or upgrade and maintain our City streets and curb-gutters	18
Easy access to outdoor recreation is important	9
Everything [in City] is close, easy to access	6
I like the low traffic, no freeways	5
Sidewalks should be fixed, kept clean and clear year-round	4
Need infrastructure to support business growth	3
Clear all sidewalks after snow storm, not just school route	2
Designate City streets for connection with trails outside of City for walking, biking	2
Don't block driveways with snow plowed from streets	2
Limit or eliminate big truck parking on US-491 and US-191 and in neighborhoods	2
Need safer pedestrian crossings on Main Street at Center and 200 South	2
Slow traffic through the City	2
ATV routes through and out of City are crucial for recreation on public land	1
Build more sidewalks	1
Downtown should be beautiful and walkable	1
Get ATVs off City streets	1
Great improvement at the school crossing on Main Street	1
I can drive myself and my friends [senior citizen]	1
I want my area annexed so the City will take care of the roads	1
Like the wide streets	1
Mark a bike lane between elementary and high schools	1
Most streets are clean	1
On our wide streets mark off pedestrian lanes	1

Pave the unpaved residential streets	1
Plow all City streets in winter	1
Uniform street lights on US-491 and US-191	1
Want a public transit option to Cortez and Moab	1
We have free parking	1
We need better utilization of the airport	1

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***TAKE AWAYS FOR THE TRANSPORTATION ELEMENT***

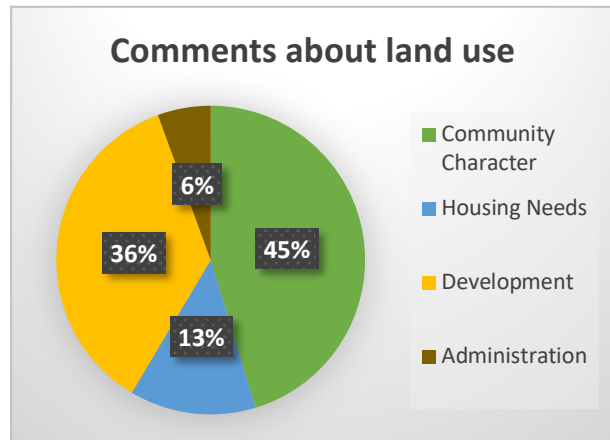
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- *54% appreciate ease of access within with City*
- *25% want repairs and upgrades to existing streets and sidewalks*
- *Emphasize pedestrian and bicycle use of City streets*
- *Make safer crossings on US-191 and US-491*
- *Plan carefully for future development to retain connectedness and safety*
- *Work with UDOT on uniform street lights and traffic calming devices*



## LAND USE ELEMENT

Like comments about the transportation network, respondents' comments about land use were made within the context of other survey questions. Collectively, participants mentioned the character of the community, housing, development, and administrative concerns. Several of the remarks about housing were also applicable to the Moderate Income Housing element of the 2027 General Plan. One respondent observed, "Monticello has outgrown its boundaries, and land is not being used in any capacity, especially in AG [agriculture] zone."



### COMMENTS PERTINENT TO THE LAND USE ELEMENT

Comment	Frequency
Need more businesses	78
Keep City small, quiet and safe	77
Need more housing and variety of housing	29
Limit number of short-term rentals	11
Everything [in City] is close, easy to access	8
Eliminate barriers to make building homes easier	6
If housing demand continues someone will develop outside of City limits	5
Need some industries	4
Limit or eliminate big truck parking on US-491 and US-191 and in neighborhoods	3
Limit or eliminate second homes	3
Allow accessory dwelling units	2
Offer incentives to builders	2
Agricultural land is not the best use when more housing is needed	1
Allow Jr Livestock and 4H kids to raise their animals in the City	1
Don't allow convicted sex offenders to live in the City	1
Don't allow high density development	1
Land banking is taking lots and houses off the market	1
More public areas are needed	1
Ok with minor zone changes if it increases housing availability	1
The City has regulations for building zones	1
The City is community centered	1
The City should not be afraid to make well informed decisions	1
The number of people is about right	1

There is no pollution in the City	1
Trailer parks seems to be downsizing and down grading	1
Vacant lots in City should be used for trailers or tiny homes	1
Walkable downtown area should be the heart of the City	1
We don't want to be like a city, we want our land uncontrolled like a small town	1
We have free parking	1
We need to grow responsibly	1

The concern that housing may be developed outside City boundaries was made in the contexts of land use regulations and economy. The Elk Meadows subdivision a few miles north of Monticello was offered by one participant as an example of how City building regulations caused the loss of opportunities for growth in Monticello. The participant noted, "It should be more advantageous to build in town vs elk meadows. Elk meadows has stolen all the development that would've made Monticello nice." The housing area west of the City was also named as an example of how the City lost opportunities for growth when it decided that culinary water could not be provided then de-annexed the area.

Throughout the survey participants acknowledged the tension between retaining the small town feel of Monticello and the need for economic growth. The emphasis on family, need for housing, desire for living wage jobs, and a tax base sufficient to support city services was noted both directly and by implication in the comments. One participant opined there may be no silver bullet for the City.

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***TAKE AWAYS FOR LAND USE ELEMENT***

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- *Business expansion should not jeopardize the small town feel of Monticello*
- *Expand areas designated for residential use*
- *Allow a greater variety of housing for purchase and rent*
- *Simplify and minimize zoning and building requirements*



## MODERATE INCOME HOUSING ELEMENT

The State of Utah defined moderate income housing as a dwelling where a household with an income no more than 80% of the area median income is able to occupy the dwelling by paying no more than 30% of the household's income for gross housing costs, including utilities.<sup>7</sup> Census data reported the median household income for Monticello was \$72,969<sup>8</sup> although another source using the same data projected Monticello's median household income to be \$63,750 in 2025.<sup>9</sup> Applying Utah's 80% requirement would mean that household income could be no more than \$51,000 to \$58,375. At no more than 30% of household income, annual gross housing costs would be \$15,300 to \$17,513 annually. A housing assessment conducted for San Juan County in 2024 reported that Monticello residents spent about 33% of their household income on gross housing costs.<sup>10</sup>

The survey asked participants to indicate income range but did not inquire about housing costs. Survey participants whose income was less than \$58,385 represented about 57% of the respondents, although the City's effort to include young people probably over represented the lowest income bracket (\$0-21,000). The survey did not ask about the type of housing occupied or whether it was owned or rented but most of the houses in Monticello were single-family homes and owner-occupancy was far greater than rentals.<sup>11</sup>

### COMMENTS PERTINENT TO THE MODERATE INCOME HOUSING ELEMENT

Comment	Frequency
The City needs affordable housing	46
The City needs all types of housing	29
Available houses are overpriced	24
Young couples cannot afford to buy houses because of high cost of living	12
Too many short-term rentals deny housing to permanent and seasonal residents	11
Eliminate barriers to make building homes easier	6
Building and remodeling is difficult because there aren't enough contractors	5
Use a diverse array of development options but always centered on citizen needs	4
Limit or eliminate second homes	3
Not enough affordable land to build on	3
Allow accessory dwelling units	2
Housing costs have increased but wages have not	2
Offer incentives to builders, like # units completed in a certain time	2
Agricultural land is not the best use when more housing is needed	1

<sup>7</sup> Utah Code 35A-8-2201(3), effective 5/12/2020

<sup>8</sup> <https://censusreporter.org/profiles/16000US4951580-monticello-ut/>

<sup>9</sup> <https://www.utah-demographics.com/monticello-demographics>

<sup>10</sup> Points Consulting, *Dwelling on the Future*, 2024, pg 78

<sup>11</sup> Points Consulting, *Dwelling on the Future*, 2024, pg 80

Don't allow high density development	1
Land banking is taking lots and houses off the market	1
More houses are needed to support business growth	1
Ok with minor zone changes if it increases housing availability	1
Reduce property taxes	1
Use private-public partnerships	1
Vacant lots should have trailers or tiny homes instead of being unused	1

About 41% of respondents specifically mentioned affordable housing as a critical need in Monticello. Most linked affordability to the local economy where wages were too low to afford existing houses. Both rental and purchase options were identified. In addition to single-family homes, respondents recommended apartments and senior living complexes as needed and appropriate for the City.

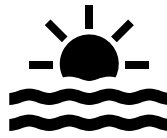
Roughly 44% of respondents believed the City could make it easier for housing development by changing the zoning ordinances and building code requirements. They also believed the changes would attract building contractors to the area. Although comments suggested the City was too strict and that the process was too long, participants did not make specific recommendations for the parts of existing code to change. However, several respondents wanted the City to be more restrictive on the number of short-term rentals allowed, the possible exclusion of second homes, and limits on the number of older homes allowed to sit empty until a family member used it for a brief time. A small number of participants suggested that owners of vacant land within the City should be required to build housing.

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***TAKE AWAYS FOR MODERATE INCOME HOUSING ELEMENT***

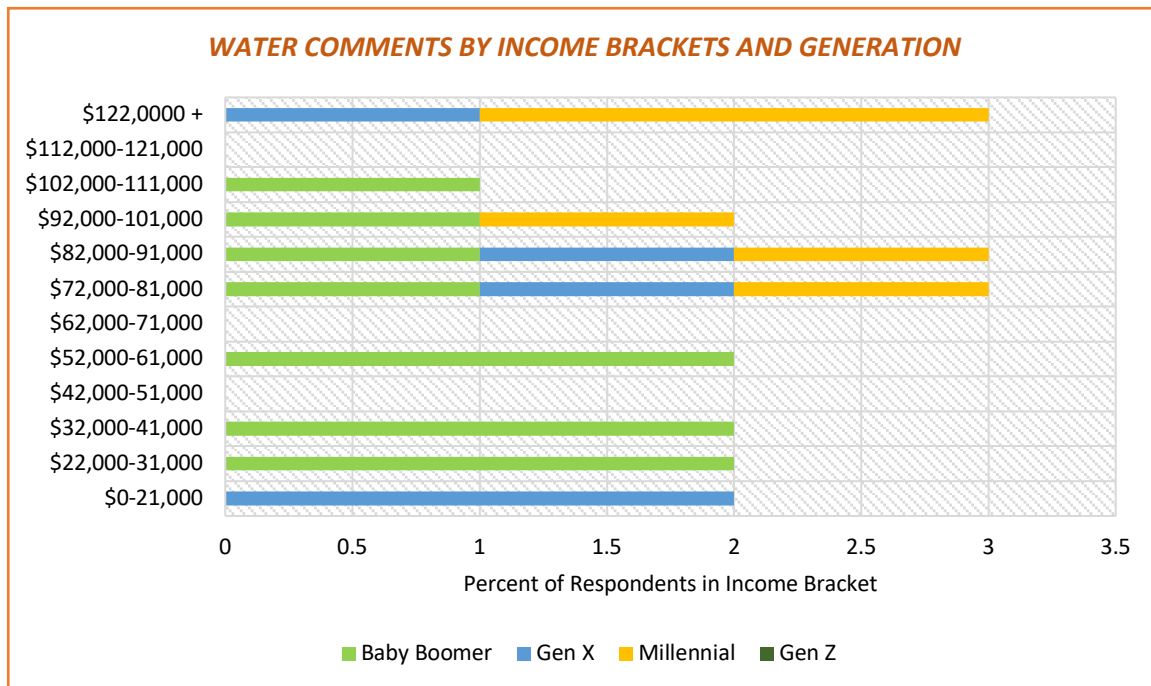
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- *Use as many options as possible but keep citizen needs at the heart of plans*
- *Include incentives in ordinances*
- *Reduce fees where possible*
- *Streamline zoning and building rules to reduce barriers and speed up construction*



## WATER USE & PRESERVATION ELEMENT

About 9.5% of respondents commented about water, but did not represent all ages or income brackets in the survey. No Gen Z respondent commented on water and three income brackets were not represented in the comments.



### COMMENTS PERTINENT TO THE WATER USE & PRESERVATION ELEMENT

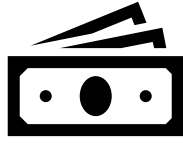
Comment	Frequency
Need more sources of water	5
City needs additional water storage	4
Plan to assure water during droughts	3
Update to our water infrastructure	3
Provide water to the area west of the City	2
Water fees are too high	2
Build a water tower	1
City can't grow because it doesn't have enough water	1
Encourage water storage at homes and yards	1
Expand secondary water service to entire City	1
Finish Spring Creek water project as quickly as possible	1
Same charges for secondary water to anyone within the City limits	1

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### ***TAKE AWAYS FOR WATER USE & PRESERVATION ELEMENT***

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- *9.5% made comments about water*
- *Only one comment about water and yards*
- *No one referred to existing ordinances affecting drainage, flooding, and water sources*
- *Small number of responses may indicate a need for education and outreach*
- *Residential landscaping options for low-water use will need greater emphasis*



## ECONOMIC DEVELOPMENT ELEMENT

The State of Utah stipulated that this element include forecasts and an economic development plan that may include revenue, expenditures, basic and secondary industry, market areas, employment, and retail activity. Economic Development was named by survey respondents as the most important service provided by Monticello.

Several survey questions were applicable to this planning element. Participants noted that having more shopping opportunities in Monticello would benefit local residents, obviously, but would also provide visitors with reasons to stop and spend time in the city. A more attractive and vibrant business district would also attract new residents. A few participants asked the City to make sure things were clean, neat, and welcoming.

### COMMENTS PERTINENT TO THE ECONOMIC DEVELOPMENT ELEMENT

Comment	Frequency
We want more restaurants	13
Clothing store	7
Fast food restaurants would be wonderful	7
Small businesses, mostly run by locals	5
Another grocery store	4
Movie theater	3
Shoe store	3
Assisted living complex	2
Bowling alley	2
Changes should not disturb Monticello's charm and tranquility	2
Community is afraid of competition but doesn't support local businesses	2
Gaming center or arcade	2
Hair salon and barber shop	2
Main Street should be filled with businesses	2
Automotive parts store	1
Build a truck stop	1
Child care	1
Eldercare or nursing home	1
Expand medical services at hospital	1
Improve fairground for larger events like rodeos	1
Indoor flea market	1
Longer business hours	1
More contractors to build businesses	1
Need some non-profit organizations	1
People are afraid to let in businesses that might bring growth	1
Pet store	1
Reinvigorate the Chamber of Commerce	1

Resort for tourists	1
Shopping plaza	1
Spend taxpayer money only on things that benefit every household	1
Host competitive sporting events to bring people to the City	3
More services for autistic and disabled persons	1
Support existing businesses	1
Technical training college	1
Tourism should be a by-product of overall business growth	1
We stay here because of family not because of investment opportunities	1

Respondents sometimes listed the names of businesses that would benefit Monticello as well as serving the needs of local families. A few noted that it would help reduce retail leakage caused by online ordering and shopping in nearby communities. Several said the addition of the businesses would provide a "3rd place" for teenagers or adults to gather (1st place = home; 2nd place = school or church). Here is their wish list:

Burger King	Walmart	Taco Bell
Five Guys	Target	In-and-Out Burger
Wagon Wheel Pizza	Dollar Tree	Kentucky Fried Chicken
Pancake House	Hobby Lobby	Wendy's
McDonalds	Dairy Queen	Pizza Hut

The link between economic growth and housing availability was undeniable in the comments. It was a chicken-and-egg dilemma--to get one the City must have the other, but where to begin? A few respondents implied that simultaneous development of businesses and housing should be undertaken but most also recognized that the lack of building contractors interested in Monticello was a drawback. Incentives were suggested by several participants as a means to entice developers to the area and was a method over which the City may have some authority. Others were afraid that the City was stuck until the national real estate sector addressed both high construction costs and the difficulty of qualifying for mortgages.

The desired direction of future growth in Monticello and the top ranked City service showed general congruence and some interesting differences. As previously noted, survey respondents slightly favored family oriented growth over a business orientation. Those who wanted to stay the same were in the minority.

**CONGRUENCE BETWEEN DIRECTION OF FUTURE GROWTH AND TOP RANKED CITY SERVICE**

Top Ranked Service	Business oriented	Family oriented	Stay as we are
Adult Recreation	2.1%	3.1%	4.5%
City Parks & Trails	9.2%	15.1%	18.2%
City Pool	2.8%	3.8%	13.6%
Code Enforcement	7.1%	6.3%	4.5%
Community Events	2.1%	5.7%	4.5%
Economic Development	43.3%	32.7%	9.1%
Golf Course	8.5%	7.5%	9.1%
Landfill Services	4.3%	3.8%	9.1%
Tourism	6.4%	5.0%	13.6%
Youth Recreation	14.2%	17.0%	13.6%

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***TAKE AWAYS FOR THE ECONOMIC DEVELOPMENT ELEMENT***

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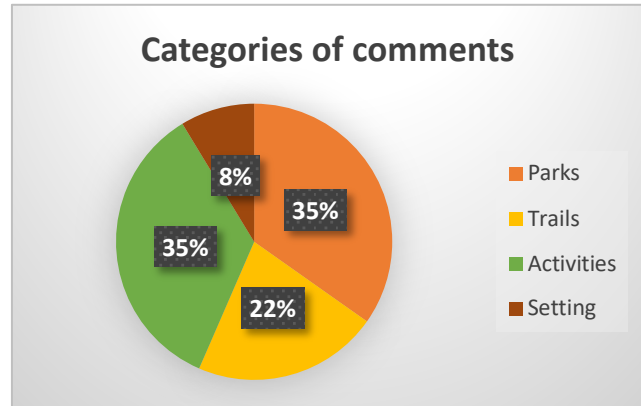
- *Expand the number and variety of locally owned businesses*
- *Assure housing development keeps pace with business growth*
- *Stimulate business-to-business communications and cooperative marketing*
- *Business growth needs to respect the character of the community*



## PARKS & RECREATION ELEMENT

As noted above, City Parks & Trails was ranked second in the importance of Monticello's services, and Youth Recreation ranked third. However, other components of the Parks & Recreation element were ranked lower: The swimming pool was 6th, the golf course was 8th, and adult recreation was 9th.

Responses to the survey questions included comments about parks and trails as public spaces and parks and trails as the location for activities. Clearly one requires the other, just as business and housing are linked. For the 2027 General Plan the City combined parks and trails with recreation as a single element. Comments were made about activities as well as parks and trails. There was no clear distinction between recreation programs and recreation activities.



The comments about setting included frequent mention of Monticello's proximity to many outdoor recreation opportunities, both inside and outside the community. Also included were comments that recreation opportunities offered by the City should focus on families, and that families felt safer because they got to know people through the recreation programs.

### COMMENTS ABOUT PARKS AND TRAILS

Comment	Frequency
Golf course is great	8
Parks are close by	6
Make the pool available all year long with longer hours	5
Appreciate the existing trail systems	3
Update and maintain playground equipment at parks	3
Upgrade the skate park	3
Invest more in our public spaces	2
Upgrade Loyd's Lake trail and picnic area	2
Get rid of sand wasps in the parks	1
Groom cross-country ski trails	1
Need trails for bikes	1
Update the parks	1
Upgrade and maintain our trail system	1
Want a park with playground equipment just for youngsters	1

**COMMENTS ABOUT RECREATION PROGRAMS AND ACTIVITIES**

Comment	Frequency
We need an indoor recreation center	19
Want more activities for youth	5
Recreation programs should be offered all year long	4
Host competitive sports events	3
More recreation programs for adults	3
Activities for non-athletic people	2
More recreation programs for teenagers	2

The recommendations for a recreation center came with some specific suggestions of what respondents wanted. For several participants the recreation center would be a focal point for bringing unity to the community, a safe place for children to gather, an area where adults could get some exercise, and a place that would be free of school and church dominance.

**SUGGESTIONS FOR WHAT A RECREATION CENTER SHOULD INCLUDE**

Inside	Outside
Weight lifting	Tennis courts
Exercise area for gymnastics, tumbling, and yoga classes	Hockey rink
Basketball and racquetball courts	Pickleball courts (light at night)
Indoor track for winter walking	Basketball court (light at night)
Large room to rent for parties	Horseshoe courts
Sauna and spa	Interactive fun park for youngsters
Bowling	Climbing wall

Suggestions for non-athletic activities included games, cooking classes, book clubs, and "many things we can think of."

**TAKE AWAYS FOR PARKS & RECREATION ELEMENT**

- *Explore financing for a recreation center*
- *Improve and expand trail system*
- *Upgrade and maintain playground equipment*
- *Provide recreation activities year-round*
- *Provide activities suitable for each age group (youngsters, children, teens, adults)*
- *Include activities for non-athletes*



## PUBLIC SERVICES & FACILITIES ELEMENT

The State of Utah defines this element to include plans for sewage, water, waste disposal, drainage, public utilities, rights-of-way, easements, police, fire protection, and other public services. The survey asked respondents to rate their satisfaction with the City's sewer, garbage collection, streets, and emergency services, as discussed above. Waste disposal was identified as Landfill Services in the survey and was ranked seventh on the list of ten City services. Water is addressed in the Water Use & Preservation element, and consideration of rights-of-way and easement are included in the Transportation element, both discussed above.

Comments concerning sewer, waste disposal (Landfill Services), and emergency services were found in response to several questions and are listed in the tables below. Numerous comments were made about cleaning vacant lots, removing unlicensed/inoperative vehicles, and tearing down abandoned buildings, all lumped into Code Enforcement and ranked last in the City's list of 10 services. Those comments are not included in the tables below.

### COMMENTS PERTAINING TO SEWER, GARBAGE COLLECTION, AND LANDFILL

Comments	Frequency
Infrastructure needs to support future growth	5
Existing employees are apathetic and disinterested in improving City	2
Landfill fees are too high	2
Adjust garbage collection routes to avoid dragging carts across the street	1
Be more transparent in how funds are expended for these services	1
Double or triple the charges for out-of-city garbage collection	1
Extend garbage collection further into the county	1
I want my property annexed into City so my sewer is property maintained	1
Lower the rates charged to make them suitable for a poverty area	1
Open the landfill for longer hours and more days	1
Provide a discount to City residents who haul their own trash to a dumpster	1
Provide a recycling program with biweekly pickup	1
Replace old sewer pipes before they burst	1
Trash needs to be picked up more frequently	1
When we need help someone always answers the phone	1

### COMMENTS PERTAINING TO LAW ENFORCEMENT AND FIRE PROTECTION

Comments	Frequency
Infrastructure needs to support future growth	5
Low crime rate contributes to a feeling of safety	5
Enforce existing ordinances without regard to religion or heritage	2
Set up speed traps to slow traffic	2
Be more receptive to investigating claims of sexual abuse of children	1

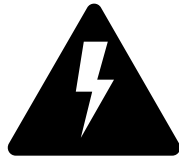
Be more transparent in how funds are expended for these services	1
City provides only fire protection, EMS is provided by county	1
Increase funding for the fire department	1
Reinstate the City police department	1
Sheriff's deputies don't spend enough time in the City	1
Teenagers get into trouble because the City doesn't have enough activities	1
We get to know law enforcement officers because the city is small	1

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***TAKE AWAYS FOR PUBLIC SERVICES & FACILITIES ELEMENT***

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- *Plan for future growth and increased demand*
- *Review and adjust fees for services*
- *Coordinate with county sheriff for increased presence in City*
- *Provide more information to public on these services*



## ENERGY CONSERVATION ELEMENT

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This element was included by the City Council because of local interest in wind and solar power generation, and requests for electric vehicle charging stations. It was an element in the 2018 General Plan. Energy conservation was not included in the City survey and only two comments could be construed as pertinent to this element. Both of the comments were made in the context of national trends rather than state or local patterns and simply acknowledged rising prices for basic services.

Over the last few years the City has updated zoning ordinances to include commercial electric vehicle charging stations and currently two stations are operational. Electric vehicle charging stations for home use are handled by existing building codes. City ordinances were updated a few years ago to address solar panel installations but at the present time wind turbines are not permitted anywhere in the City.

The Latigo Wind Farm, situated northwest of the City but outside of the corporate boundary, has been operational for several years and sells power to PacifiCorp. None of the power is directly utilized within the City, but the substation where the power links to the PacifiCorp power grid is within the City boundary and contributes to the tax revenues collected by the City.

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### ***TAKE AWAYS FOR ENERGY CONSERVATION***

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- *Revise zoning ordinances to include wind turbines for home use*
- *Update City energy conservation plans for its buildings and vehicle fleet*
- *Investigate how the City can encourage energy efficient construction*



## PUBLIC INFORMATION & CITY ADMINISTRATION

The City must comply with Utah public noticing requirements during preparation of the 2027 General Plan and when holding certain meetings. City administration must also comply with state rules affecting meetings management, transparency, fiscal accountability, and others. The survey provided several questions for respondents to comment on these topics and additional comments were scattered elsewhere in the survey.

Overall, the respondents congratulated the City on all of its efforts to keep the public informed. In particular, several commented on how much better the current City staff and City Council are doing with information sharing and transparency than did their predecessors. Nonetheless, participants responded with concerns about communications.

### COMMENTS ABOUT PROVIDING INFORMATION TO THE PUBLIC

Comments	Frequency
I don't know when city meetings are held	18
Everything is available for any who want to look	17
City Council is not receptive to public input	7
Nothing is ever posted	5
Don't rely on churches to get the word out	4
Not much information on Facebook about agenda or outcomes	3
City Council and Planning Commission are easy to track, other committees are lost in the dark	2
City website is not current or informative	2
Present City administration is doing more to reach out	2
Want updates on implementation of decisions	2
City Council does not give enough time for public input	1
Community event schedules should be on the city utility bill	1
How do I find out about volunteer opportunities?	1
I can't hear at City Council and Planning Commission meetings	1
I enjoy the newsletters	1
If you don't read the newspaper and aren't on social media you are not informed	1
Information packets not available early enough to give us time to think about issues	1
Post meeting agenda online	1
Why don't we hear about City happenings that are not public meetings?	1

The first five comments about providing information to the public suggest that the methods currently used are not as effective as the City desired. On the other hand, it may mean that respondents were not taking personal initiative to be informed citizens. Comments about not knowing when meetings are scheduled were not unique to any age group or income bracket. The

City cannot be responsible for how or if a resident wishes to be informed, but the City can make adjustments to the methods used to reach out.

Survey participants were generally complimentary about the present City administration, but concerns were apparent in their comments. Expenditure of tax payer funds, consideration of all community members without regard to religious affiliation or heritage, protection of community qualities, and continuity from one City Council to the next were areas of interest.

**COMMENTS ABOUT CITY ADMINISTRATION**

Comments	Frequency
City workers, City Council, and volunteers are doing a great job	11
Include all segments of the community without regard for religion or heritage	5
City fees are too high	4
Disagreement with City policy or decisions led to "blacklisting" and personal attacks	4
Make sure plans and projects protect our small, quiet, and safe city	4
City tells us what they want us to hear in meetings but does differently later	3
When you can't use a volunteer, be nice in the way you tell them thanks	3
City Council is not going in the right direction	2
Identify a theme or a unique feature of the City to use in promotions	2
Raise taxes to fund what we need	2
Tax payer funds should benefit the community and not white Mormon families	2
When you need more money, hit up the golfers and tourists. They're rich.	2
Add at least 500 people to our population	1
Annex more land to expand the tax base	1
Audio recording of meetings is very poor quality; hard to understand	1
Community is very competitive and this is off-putting to new arrivals	1
Develop a long-term growth plan	1
Develop a plan for long-term maintenance and expansion of City facilities	1
Don't be afraid of competition	1
Don't waste money on costly studies when locals can help	1
Focus on the people who live here before thinking of other things	1
Local government is more responsive than national government	1
No meaningful development efforts in 30 years. Change direction.	1
People are so busy self-promoting that they are not doing their jobs	1
Show us how the City collects and spends money on services	1
Spend tax payer money only on things that benefit every household	1
What does City government do? What do the employees accomplish?	1
How do you make sure new City Councils implement decisions made in prior City Councils?	1
Why do we rely on volunteers to do what other cities hire workers to do?	1

Review of the comments suggests that most respondents thought about the City that they would like to live in and have their children return to in the future. While there were a few comments that appeared angry, very few seemed flippant. Several participants expressed appreciation for the opportunity to share their opinions.

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**TAKE AWAYS FOR PROVIDING INFORMATION TO THE PUBLIC**

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- *Place a high priority on keeping the City website current*
- *Display agenda on Facebook in addition to the town cloud link*

- *Continue the multi-media methods of communicating with the public*
- *Gather and keep current lists of email addresses for people wanting to be contacted via email*
- *Consider adding processes like building permits, financial accountability, etc., to the "101" courses offered occasionally by the City and invite the public to participate*

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### ***TAKE AWAYS FOR CITY ADMINISTRATION***

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- *Provide information about implementation of City Council decisions*
- *Help residents better understand tracking of City revenues and expenditures*
- *Consider how City Council decisions will affect our small, quiet, and safe community*
- *Develop long-term plans for growth and the expansion of city facilities*



The Land Above the Canyons

## Operational Limits of Loyds Lake during Stage 4 Water Restrictions

### *Loyds Lake Assigned Elevations:*

Lake Elevation	Lake Depth	Storage Amount (Acre Feet)	Owner
7094 – 7107	16	500	Conservation Pool
7108 – 7129	21	1000	City of Monticello
7130	-	-	Selling Point for End of Water Season San Juan Water Conservancy District
7130 – 7134	5	250	City of Monticello (No Carry Over)
7135 – 7140	6	500	Blue Mountain Irrigation (No Carry Over)
7141 – 7144	4	300	Gary Halls (No Carry Over)
7145 – 7156	12	925	San Juan Water Conservancy District – City of Monticello
7157			Spillway

### Stage 4 Water Operations

#### Lake Elevation Reaches:

7118

- Secondary Pond Limit to 50-acre feet
- Golf Course Limit to 50-acre feet
- Parks Water from Wells

7116

- Golf Course & Secondary Off

These limits create a buffer of 300-acre feet that will be able to supply the City with 1 year of culinary water. With water from the mountain collection system this means that the reserve supply of water will last longer than one year but will depend on each snow season. These recommendations will set operational limits only when the City is in a Stage 4 Secondary Water Restrictions. Other restriction levels do not need to be developed due to the extra water the city has above the selling point at 7130 elevation.

**QUOTE #**

**BBBQ79650**

Date Quoted 3/11/2026

EXPIRATION DATE 4/10/2026

*Due to extreme market volatility of raw materials, quotes are reviewed and revised after 30 days. Products ordered for shipment after the expiration date on this quote will be adjusted to the price in the quote valid at the time of the shipment.*

<b>Quote To:</b> Account Code 918262	<b>Ship To:</b> Account Code 918262
<b>CITY OF MONTICELLO UT</b>	<b>CITY OF MONTICELLO UT</b>
<b>CHRIS BAIRD</b>	
17 NORTH 100 EAST MONTICELLO, UT 84535 US	17 NORTH 100 EAST MONTICELLO, UT 84535 US
<b>Mobile:</b>	
<b>Phone:</b> 435-587-2271	
<b>Fax:</b>	CHRIS BAIRD
<b>Email:</b> chris@monticelloutah.org	435-587-2271 chris@monticelloutah.org

**Project Title:**

<b>Bid Date:</b>	<b>Terms:</b> NET 30
<b>Bid Number:</b>	<b>F.O.B.:</b> PPD- ADD FREIGHT
<b>Project Start Date:</b>	<b>Ship Via:</b> Truck/Common Carrier
<b>Ship Before:</b> 4/10/2026	<b>Sales Group:</b>
<b>Quote Effective Dates:</b> 3/12/2026 TO 4/10/2026	<b>Quoted By:</b> Jared Sanford
	<b>Sales Office:</b> CR3- Jared Sanford

**Estimated Time to Ship After Receipt of Order:**

<b>Customer:</b> CITY OF MONTICELLO UT	<b>Quote Number:</b> BBBQ79650
<b>Project Title:</b>	<b>Date:</b> 03-11-26

**SALES TAX EXEMPT CERTIFICATE MUST BE PROVIDED AT THE TIME OF ORDER OR SALES TAX WILL BE ADDED TO YOUR ORDER**

Part #	Description	Unit	Qty.	Quote Price	Ext. Price
34211-SRCUT-PM	ROADSAVER 211 PLEXI-MELT	LB	21,000	\$0.5601	\$11,762.1000
6008224	FREIGHT CHARGE	EA	1	\$1,300.0000	\$1,300.0000

*Due to extreme market volatility, all prices and availability are subject to change without notice, all quotes to be confirmed at time of order and subject to inventory status.*

**BABA (Buy American Build American) Compliance Certificates must be requested prior to shipment.**

**COMMENTS:**

**Freight is estimated and will be requoted at time of order.**