Tab 3

Metropolitan Water District of Salt Lake & Sandy
Board Meeting Information
Last Update: December 7, 2023

Agenda Item: Consider approval of Utah State University water audits program for 2024

Objective: Provide an update to the board regarding the water audit contract and seek a recommendation for approval of the expenditure for another year.

Background: Water checks are conducted from mid-May through August for Salt Lake City and Sandy City residents and CII (commercial, industrial, and institutional) entities. Both member cities indicate continued support for the program. The Water Audit Program is a voluntary program. When a resident or business requests a water audit, Utah State arranges for a Water Check employee to conduct the water check.

The District entered into a contract with Utah State University (USU) for water audits on January 13, 2021 that allows for up to five (5) twelve (12) month extensions. The contract year begins February 1 and ends January 31. The annual contract amount will not exceed $80,000.

In January 2022, the board approved increasing the water check budget from $80,000 to $116,000 to address the record number of requests received in 2021. The increase allowed for USU to hire a scheduler and two more water checkers which increased the total teams from two to three teams. In January 2023, the board supported maintaining the budget at $116,000. The past year experienced less requests so USU only hired two water check teams instead of three. The final cost for 2023 is less than $90,000.

Table A

Feb 1- Jan 31	Not to Exceed Contract Amount	Water checks completed (Residential/CII)
2021	$80,000	217/27
2022 (1st extension)	$116,000	654/17
2023 (2nd extension)	$116,000	231/22
2024 (3rd extension)	$116,000	

Committee Activity: The Environmental Committee met on December 5, 2023 and discussed the 2024 budget for the water audit program. The committee recommends approval by the full board of an amount not to exceed $116,000 for total compensation for services performed in 2024.

Recommendation: Approval by the full board of an amount not to exceed $116,000 for total compensation for water audit services performed in 2024.

Attachments:

- 2024 Water Check Program budget (BP059)

- Scope of work for 2024 (BP060)
- 2023 Executive Summary (BP064)
- 2023 Water Check report (BP065)

2024 PROPOSED WATER CHECK BUDGET

Item	Amount	Benefits	Total
Program Administrator/Manager (Kelly Kopp)	$21,000	$9,240	$30,240
Water Checker (1 @ $18/hr x 30 hrs/wk x 12 wks)	$6,480	$505.44	$6985.44
Water Checkers (5 @ $16/hr x 40 hrs/wk x 12 wks)	$38,400	$2995.20	$41,395.20
Scheduler (1 @ $20/hr x 20 hrs/wk x 12 wks)	$4,800	$2,112	$6,912
Travel	$7,000		$7,000
Supplies, App & Database Management	$8,000		$8,000
Subtotal			**$100,532.64**
Overhead Costs (Required by USU)	**15.3% of total cost**		$15,381.49
Total			**$115,914.13**

Budget Justification

Program administrator and scheduler salaries are benefited at a rate of 44%, as per USU requirement.

Water Check intern wages are benefited at a rate of 7.8%, as per USU requirement.

Overhead costs represent the infrastructure costs assessed by USU for relevant facilities and equipment use. For internal budgeting purposes, and to meet federal requirements, these costs must be separated from other program fees in accordance with USU policy.

The proposed budget includes the cost of three teams of interns to perform the outdoor water audits. Based on previous experience, we estimate that a single team of interns will be able to complete as many as 240 audits over the course of the growing season, depending on the size of the properties evaluated.

Should MWDSLS determine that more audits performed in the service area are desirable, an additional team may be added with the associated increases in costs. The cost per team is estimated at $16,558 per season (assuming $16/hour per person).

Metropolitan Water District of Salt Lake and Sandy Water Check Program-2024

Scope of Work

The proposed work continues the Water Check Program in the Metropolitan Water District of Salt Lake and Sandy (MWDSLS) service area in 2024. We will continue to utilize the Water Check application for the collection of program data and automated data storage and reporting, and we will also continue testing the complementary GIS-based mapping tool.

Introduction

Water supplies in Utah continue to be strained by increasing demand due to population growth and periodic drought. And while the winter of 2023 offered some relief, there is no guarantee that future water supplies will not be strained by growth and drought. In response, irrigation water applied to landscapes continues to be a focus of MWDSLS's conservation efforts.

Landscape irrigation system evaluations accompanied by irrigation schedules, otherwise known as Water Checks or audits, have been used by MWDSLS to reduce water use in its service area. To date, the District's focus on landscape water conservation through the Water Check Program has resulted in an average annual savings of 64,000 gallons of water and associated financial savings per participant household.

A Water Check consists of evaluating system effectiveness by testing uniformity of water application and irrigation system maintenance and assessing operational factors that limit system efficiency in applying water. This evaluation is combined with a recommended irrigation schedule and educational materials that are presented to program participants and reviewed for clarity and to answer participant questions.

In 2024, the recommended irrigation schedule and requested educational materials will be provided by email to program participants. In the eventuality that a participant does not utilize email, the recommended irrigation schedule and educational materials will be provided onsite, sent to the participant by mail, or hand-delivered in the course of nearby work (report will also be reviewed onsite with participant).

Two explicit outcomes are expected from Water Checks; sustained reduced water consumption and enhanced public relations and awareness. A third expectation underlies both of these outcomes: Water Checks help reach the population of water users with the greatest capacity to conserve. Our ability to reach customers with the highest capacity to conserve was greatly improved in 2020, as a WaterMaps® analysis of the Salt Lake City Service area was completed by USU colleague, Dr. Joanna Endter-Wada. This analysis has identified areas and neighborhoods in the city with high rates of outdoor irrigation, allowing us to the opportunity focus our efforts more directly in these neighborhoods. WaterMaps® analyses are repeated periodically and, in 2024, we plan to continue reaching out to those customers and neighborhoods that have exhibited the highest capacity to conserve.

The proposed Water Check Program will continue to provide landscape irrigation system evaluations and irrigation schedules as a free service (underwritten by the District) available to residential and commercial-industrial-institutional (CII) water users within the service area of MWDSLS. The program will also continue analyses of existing program data, including the prioritization of irrigation system flaws in terms of their effect on irrigation system efficiency.

In addition, the Water Check program will continue to evaluate the following questions:

- Do Water Checks encourage end users to conserve water compared to historical use patterns?
- Do Water Check participants conserve water in comparison to the general population not receiving Water Checks?
- Are the water savings achieved by Water Checks sustainable over time and for how long?
- Is the pattern of water use in the population requesting Water Checks the same as the general population?

In addition to these ongoing efforts, Water Check program employees/interns will also perform assessments within the Salt Lake City Department of Public Utilities service area of residential and CII landscape composition as scheduling and location allows. These assessments will provide supplemental information about landscape composition as it relates to the Utility's usage of the WaterMAPS water demand management tool. To support this effort and to conduct detailed Water Checks at SLC golf courses, the SLCDPU Conservation Program will provide budget support for additional Water Check team members, if necessary.

Methods

The procedure for conducting Water Checks is comprised of introductory training for program employees/interns and specific procedures for performing each Water Check.

Training for program employees/interns includes:

- Detailed instruction on ornamental plant-soil systems, with an emphasis on common landscape problems;
- In-depth study of irrigation scheduling as it pertains to climate data, allowing employees/interns to tailor irrigation schedules to clients receiving checks;
- Performance of several "sample" Water Checks with an experienced trainer; and,
- Spot-checking and confirmation of procedures over the course of the growing season.

Additional training related to the use of the application will include:

- Detailed instruction on data entry utilizing i-Pads;
- Detailed instruction on report development for participants;

- Detailed instruction on uploading each day's data to the program database over wireless internet connection.
- Instruction on utilizing and implementing the GIS-based mapping tool for Home-Owner Associations (HOAs).

Water check procedures include:

- Work by Water Check teams, allowing for increased quality of data collection and safety;
- Measurement of physical area for turfgrass, shrub/tree, hardscape, and permeable surface areas;
- Identification of landscape and irrigation system characteristics and flaws;
- Performance of catch cup tests of irrigation system distribution uniformity;
- Evaluation of soil texture and plant rooting depth; and,
- Instruction of program participants on programming their irrigation controller.

Program Impacts

With the permission and assistance of the District's member cities, billing data may be requested for each client receiving a Water Check. Landscaped areas determined from the Water Check may then be used to normalize billing data from volume units to depth units. The following comparisons may then be made to:

- Estimate water needs. Comparison of the water use of program participants to estimated needs determined from climate data collected from local weather stations. Estimated needs of program participants will be normalized by measured local evapotranspiration (ET) rates.

- Determine historical outdoor water use for an individual client. This comparison will depend on initial baseline water use as well as the limitations of the available water billing data.

- Compare program participants with non-participating population. A control population of water users of the same type (residential) may be selected each year for comparison to water check recipients where such data is obtainable. The control group's actual water use will be calculated based on billing data and estimated irrigated landscape area. The control group will be matched to program recipients in terms of property location, value, and size.

Reporting

In 2024, reporting to the District's member cities will occur weekly. These reports, delivered by email, will include:

- Participant names, addresses, and contact information;
- Date they submitted their request for a Water Check; and

- Date the scheduled Water Check was conducted.

2023 Water Check Program Report

Prepared for the Metropolitan Water District of Salt Lake and Sandy by Kelly Kopp, Ph.D.

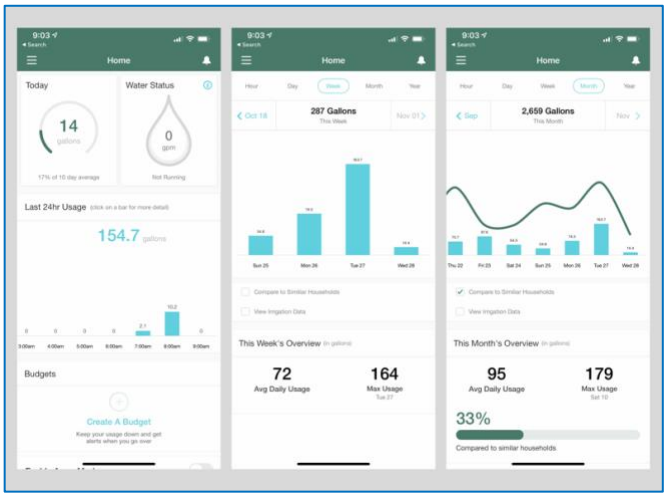
The 2023 Water Check season began on May 22nd and ended on August 30th. In the early season, we focused on the off-season requests we had received following the 2022 season. We also focused on Salt Lake City Municipal properties in 2023 at the request of the city and in support of their City Property Water Use Efficiency Report. In addition, we had a request to complete a full audit of Sugar House Park. Following WaterMAPS™ analysis of Salt Lake City, Cottonwood Heights was found to have a high proportion of high irrigation water users in their service area. With this information, and by working with Cottonwood Heights city staff, we were able to focus Water Check efforts there and completed 38 Checks.

In 2023, 157 residential and 14 commercial, industrial, or institutional (CII) Checks were completed in the Salt Lake City service area and the 14 CII Checks completed represented 199 HOA units. In Sandy City, 74 residential Checks were completed, and we did not have any requests for CII Checks.

Table 1. Parcel characteristics of single-family residences participating in the Metropolitan Water District of Salt Lake and Sandy Water Check Program in 2023.

	SLCDPU (157)		Sandy City (74)		MWDSLS (231)	
Single Family Residential	Sq. ft.	% of parcel	Sq. ft.	% of parcel	Sq. ft.	% of parcel
Parcel Area	11,494		11,518		11,506	
Hardscape Area	4985	43%	4855	42%	4920	43%
Turfgrass Area	3770	33%	4409	38%	4090	36%
Other Irrigated Area	2048	18%	1536	13%	1792	16%
Total Irrigated Area	5818	51%	5945	52%	5882	51%

During the summer of 2023, a study was conducted of the efficacy of the Water Check Program by implementing Flume Water Monitoring in 59 participating households in the Cache Valley. Home water use data was collected every 5 seconds for a period of 2 weeks prior to a Water Check and for 1 month following the Water Check. After participation in the Water Check Program, irrigation water use by program participants decreased from 20-30%, on average, and resulted in water savings of 626,000 gallons (1.9 acre-feet) during the month following participation.



Follow-up surveys of study participants indicated that participants would like follow-up Water Checks after irrigation and landscape problems had been repaired, drip irrigation zone assessment, more direct work with HOAs, sharing examples of water-wise landscapes, providing contact information for landscape contractors, and connecting participants to the appropriate city staff (water conservation managers). This study was funded by a USU Extension Water Initiative Grant ($150,000).

Program Developments & Recommendations

We will continue to implement COVID-19 protocols as requested and continue to have cancellations due to this illness. We will continue to coordinate with Slow the Flow, Utah Water Savers, and the Utah Growing Water Smart program. On-line sign-ups through the Center for Water Efficient Landscaping is working well, though we continue to receive requests from outside the service area.

Program Budget

This year, we had 2 Water Check teams and have ended the season $27,794 under budget. Related, if we do not spend a portion of the budget, we do not invoice for the full budget amount.

2023 Water Check Program Report

Prepared for the Metropolitan Water District of Salt Lake and Sandy

Kelly Kopp, Ph.D.
Program Administrator

Center for Water Efficient Landscaping
Utah State University Cooperative Extension

2023 WATER CHECK PROGRAM OVERVIEW

In 2023, the Water Check Program supported 2 teams of Water Checkers to conduct residential, commercial, and institutional Checks. In the Salt Lake City service area, we also focused on Checking city properties and worked with Sugar House Park to begin the process of a complete Water Check of the property. We started the season on May 22nd and ended on August 30th.

The early season was focused on contacting all participants who requested Checks following the completion of the 2022 season. These requests were organized by location and date of request and contacted in the order in which they were received. Three means of communication were utilized (phone, text, email) and at least 3 separate contacts were made (very often 9) to ensure that those who still wanted a Water Check received one. This process began in March/April and continued throughout the season as we received more requests.

We continued to have the occasional cancellation due to COVID-19 this year, and so continued to provide employees with face masks and sanitizing products. In the event that program participants requested the use of masks, employees were able to comply.

THE WATER CHECK PROCEDURE

In addition to the ongoing COVID-19 safety measures, the Water Check process consisted of five steps:

- Conducting a site walk-through;
- Conducting catch cup, pressure, soil/root depth tests;
- Analyzing site information and test data using a tablet-based application;
- Preparing a customized watering schedule, and;
- Explaining and summarizing Water Check results with the participant.

WATER CHECK PROGRAM DATA

Data collected in the program included, but was not limited to:

- Participant information (i.e. own vs. rent, number of individuals in household);
- Landscape and parcel data (i.e. square footage of parcel, turf, hardscape);
- Irrigation system data (i.e. existing irrigation schedule, location of broken heads), and;
- Program marketing data (i.e. how did participants learn about the program).

PARTICIPATION DATA

The number of residential Checks completed in Salt Lake City in 2023 was 157, while the number of residential Checks completed in Sandy City was 74. In addition, 22 CII Checks were completed

in Salt Lake City. Of these, 5 were HOAs representing 251 units, 4 were libraries, 10 were fire stations, 1 was a police precinct, 1 was the Salt Lake Sports Complex, and 1 was a golf course. The Water Check for Sugar House Park was begun but not completed in 2023 and will continue next year. Therefore, it is not included in the total number of Checks for 2023.

When working on SLC city properties, full audits were completed rather than testing representative zones. This, necessarily, made these Checks significantly more time consuming.

From 2005-2023, 3,701 residential Water Checks were conducted in MWDSLS service area, along with 192 CII Checks (Table 1).

Table 1. Number of residential and CII Water Checks for the MWDSLS service area, 2005-2023. Numbers in parentheses indicate the number of HOA units represented (participant numbers for previous years may be found in previous year's reports).

	SLCDPU		Sandy City		MWDSLS	
	Residential	*CII*	*Residential*	*CII*	*Residential*	*CII*
2005	50	0	34	2	84	2
2006	62	7	29	1	91	8
2007	58	13	29	0	87	13
2008	170	2	52	1	222	3
2009	158	5	76	1	234	6
2010	203	14	50	1	253	15
2011	104	6	38	0	142	6
2012	104	0	45	0	149	0
2013	185	4	52	2	237	6
2014	206	1	44	0	250	1
2015	141	8	46	0	187	8
2016	104	2	53	0	157	2
2017	64	0	121	1	185	1
2018	79	1	53	14	132	15
2019	43	1	25	0	68	1
2020	67	34	54	5	121	39
2021	166	26	51	1	217	27
2022	421	14 (199)	233	3 (36)	654	17 (235)
2023	157	22 (251)	74	0	231	22 (251)
Total	*2542*	*160*	*1159*	*32*	*3701*	*192*

LANDSCAPE AND PARCEL DATA

Parcel size data as it relates to landscaped and irrigated area are essential for detailed analyses of water use on a per-parcel basis. Among 157 residential participants within the SLCDPU service area, average parcel size was 11,494 ft^2, and irrigated landscape area as a percentage of lot size was 51% (Table 2). These numbers reflect a slight increase from the average size of landscapes evaluated in 2022 (11,346 ft^2), and a similar percentage of irrigated landscape area (50%).

Among Sandy City's 74 residential participants in 2023, average parcel size was 11,518 ft^2, and irrigated landscape area as a percentage of lot size was 52% (Table 2). These numbers reflect a decrease from the average size of landscapes evaluated in 2022 (12,451 ft^2), and a slight increase in the percentage of irrigated landscape area (50%).

Across the MWDSLS service area, average parcel size was 11,506 ft^2, and irrigated area as a percent of lot size was 50% (Table 2). These numbers reflect a decrease from the average size of landscapes evaluated in 2022 (11,899 ft^2) but are the same in terms of percentage of irrigated landscape area (50%).

For both Salt Lake City and Sandy City, the percentage of landscape planted in turfgrass was higher than in 2022. In Salt Lake City, average turfgrass area was 33% in 2023 compared to 28% in 2022. In Sandy City, average turfgrass area was 38% in 2023 compared to 32% in 2022.

Table 2. Average residential parcel and landscaped areas in the MWDSLS service area (2023).

	SLCDPU		Sandy City		MWDSLS	
	ft^2	*% of Parcel*	*ft^2*	*% of Parcel*	*ft^2*	*% of Parcel*
Avg. Parcel Area	11,494		11,518		11,506	
Avg. Hardscape Area	4985	43%	4855	42%	4920	43%
Avg. Turfgrass Area	3770	33%	4409	38%	4090	36%
Avg. Other Irrigated Area	2048	18%	1536	13%	1792	16%
Avg. Total Irrigated Area	5818	51%	5945	52%	5882	51%

IRRIGATION SYSTEM DATA

Water Check Program employees tested the precipitation rates, distribution uniformities and dynamic pressures of "testable" zones for each irrigation system evaluated. Precipitation rate is the rate at which irrigation water is applied per unit of time measured in inches per hour (in/hr). Distribution uniformity (DU) refers to how evenly the irrigation system applies water to a given

area and is often expressed as a percentage or a decimal. Dynamic pressure is defined as a property of a moving flow of liquid expressed as pounds per square inch (psi).

Overhead spray irrigation heads are designed to apply a continuous stream of water and are fitted with nozzles. These heads are generally designed to cover relatively small areas with spray radii between 3 and 15 feet, and a specified operating pressure between 15 and 30 psi. Spray head precipitation rates generally vary from 1 to 2.5 inches per hour.

Rotor heads provide single or multiple streams of water to the landscape and distribute water in an arc pattern, typically ranging from 40 to 360 degrees. The spray radius for most rotor heads is 20 to 150 feet with a precipitation rate between 1 to 1.5 inches per hour. Additionally, rotor heads operate under a wide range of dynamic pressures, ranging from 20 and 100 psi.

Figure 1. Examples of a rotor sprinkler head (L) and an overhead spray sprinkler head (R).

Average sprinkler precipitation rates were variable across the SLCDPU and Sandy City service areas, with spray heads applying higher precipitation rates than rotor heads or MSMT heads. In the SLCDPU service area, average precipitation rate for residential properties was 1.19 in/hr and average DU was 53%. In the Sandy City service area, average precipitation rate for residential properties was 1.12 in/hr and average DU was also 53%. Distribution uniformities in both service areas were less than what is achievable according to manufacturer's specifications, regardless of head type (65% and 75% DU are considered achievable for spray and rotor heads, respectively).

In the SLCDPU service area, average precipitation rate for HOAs was 1.23 in/hr and average DU was 49%. Average precipitation rate for libraries Checked was 1.28 in/hr and average DU was 56%. Average precipitation rate for fire stations Checked was 1.10 in/hr and average DU was 50%.

The best DU observed in the SLCDPU service area was 79% (a residential property) and the best DU observed in the Sandy City service area was 82% (also a residential property). In both cases, these DUs were achieved with rotor sprinkler heads.

Though it is not a standard or recommended design practice, we continue to observe spray, rotor, and MSMT sprinkler heads being operated in the same zone on many properties.

PROGRAM MARKETING DATA

Each year, we ask program participants how they learned about the program and why they participated. In 2023, 36% of participants learned of the program through a website, 11% learned of the program through their water provider or by word of mouth, and 9% learned of the program through TV, radio, or newspaper advertisement. Twenty-five percent of participants learned of the program through a combination of methods (Figure 2).

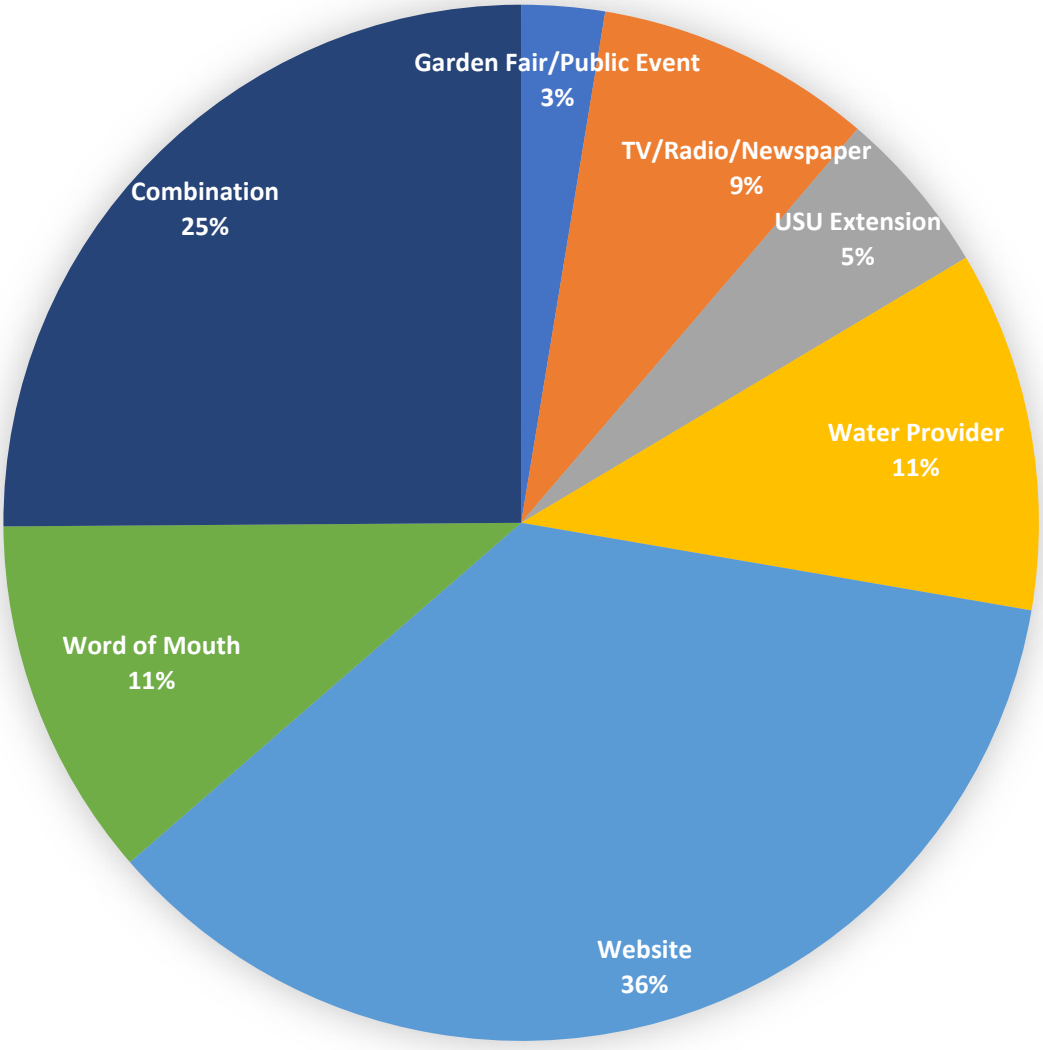


Figure 2. How participants learned about the program in the MWDSLS service area (2023).

In 2023, participants participated to save water (29%), followed by interest in gaining knowledge/education (14%), and landscape problems (3%). Fifty-three percent of participants wanted to participate for a combination reasons (Figure 3).

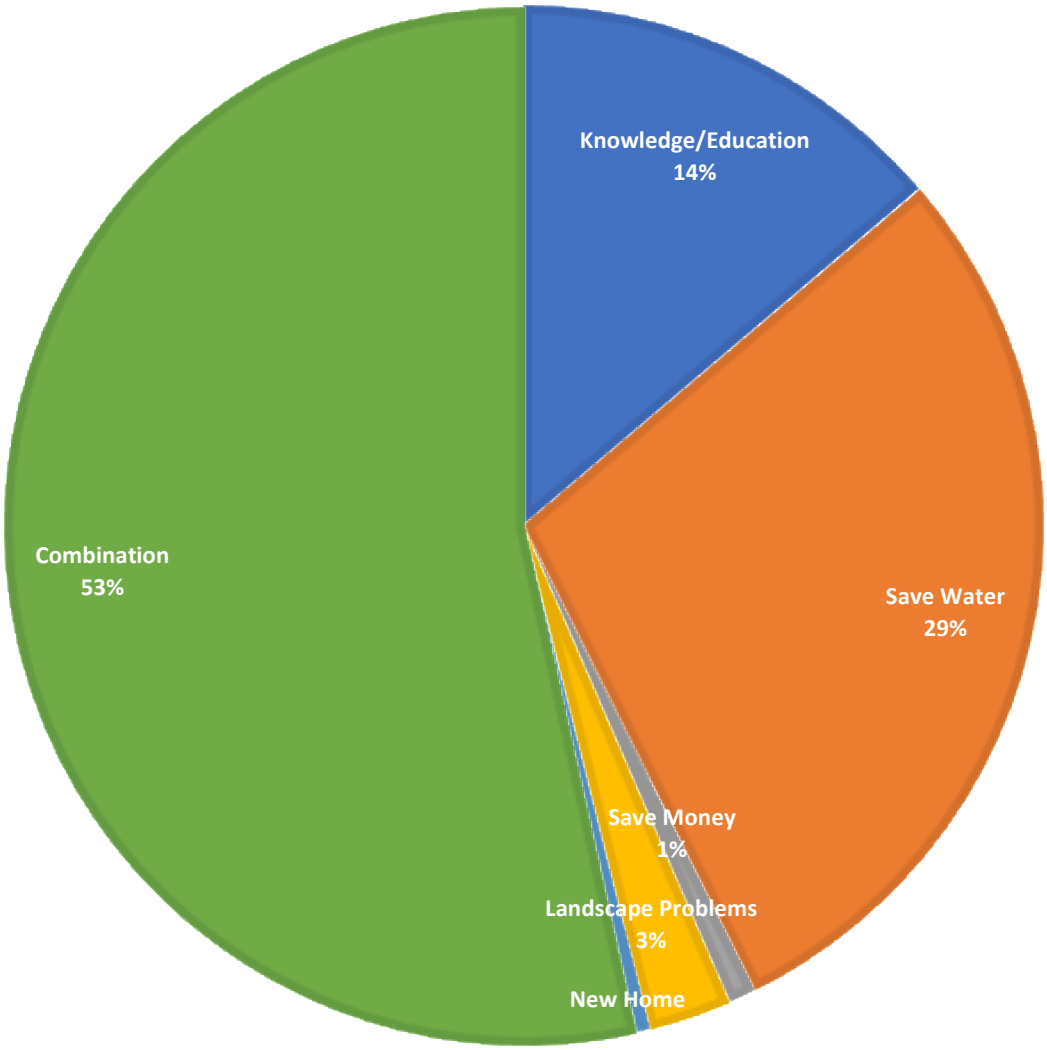


Figure 3. Why participants participated in the program in the MWDSLS service area (2023).

WATER SAVINGS ANALYSIS

In 2022, Water Check-related funding was secured from the USU Extension Water Initiative Grant Program ($150,000) to evaluate the efficacy of the program. This effort supported the installation of Flume™ Water Monitoring devices in homes in the Cache Valley Water Check program that subsequently received a Water Check. Water use was monitored both before and after participation in the Water Check program and analyses of the associated data was completed in 2023.

Water use of participating households was monitored every 5 seconds by the Flume™ devices during the study. Following a Water Check, highly significant water savings was observed by the 59 participating households from Logan and Hyde Park, averaging 20-30%.

In total, participating households reduced their water use by 626,000 gallons (1.9 AF) during the course of the study. Higher water users participating in the study tended to reduce their usage to align with an appropriate water budget and lower water users reduced their usage even further below an appropriate water budget.

Follow up interviews with study participants focused on suggestions for improving the Water Check program and included:

- Follow up visits with participants following irrigation/landscape repairs,
- Assessing drip irrigation zones,
- Working more directly with HOAs,
- Adding a 1-page summary to the Water Check report,
- Sharing examples of water-wise landscapes,
- Sharing contact information for landscape contractors, and
- Connecting participants to the appropriate city staff (water conservation managers).

PROGRAM DEVELOPMENTS & RECOMMENDATIONS

In 2023, online program sign-ups continued through USU CWEL's website (cwel.usu.edu/watercheck). Voice messaging to the main CWEL phone number was also continued for individuals wishing to receive a Water Check, although we receive far fewer phone requests than online requests. We continued with our revamped scheduling process this year to meet the goal of accommodating every request we received and were able to do so. One ongoing challenge we have is that we continue to receive requests from all over the state and it takes time to redirect them to the appropriate programs or to our "D-I-Y Water Check" website.

In terms of program advertisement, we are considering how to reach new homeowners. Real estate professionals or home building companies could be partners in this process and we are considering how best to work with them.

Weekly reporting to the District, SLCDPU, and Sandy City also continued in 2023.

7-6-2023

Increasing the Impact of Utah State University's Extension Water Check Program With 5-Second Metering

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Increasing the Impact of Utah State University's Extension Water Check Program with 5-Second Metering

Study Goal – Increase the volume of water saved by the Utah State University (USU) Extension landscape Water Check program

because outdoor water use is the largest component of residential use with the largest opportunity to reduce use. We used 5-second water use data collected with Flume Smart Home Water Monitoring devices (Figure 1) at residential homes before and after a Water Check (Box 1; Figure 2) to answer four questions:

1. How much water did households save?
2. Which Water Check recommendations did participants implement?
3. Why did participants implement some recommendations and not others?
4. How to further reduce landscape water use?

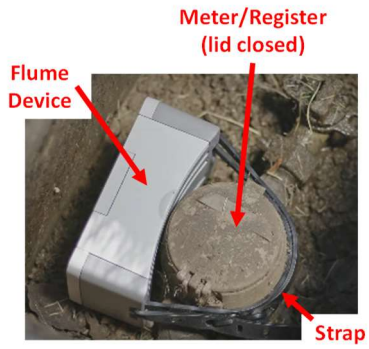

Figure 1. Flume Smart Home Water Monitoring device strapped around a water meter.

Results – 59 Households collectively reduced water use by 626,000 gallons—1.9 acre-feet.

Significantly different than no savings with 99.998% confidence (Table 1).

Participants reduced their use by:

1. **Reducing** water application to more closely match their landscape water budget.
2. **Reducing** the duration of irrigation events and number of irrigation events per day.
3. **Increasing** days between irrigation events.

Large water users reduced use closer to their budgets. Small users started below their budgets and further reduced use. Landscape water budgets also declined seasonally.

Findings were similar across the two participating cities – Logan and Hyde Park, Utah.

We implemented seven suggestions to improve the Water Check program (Box 2, next page).

Box 1. Study Characteristics

- **Time:** July to October, 2022
- **Locations:** Logan and Hyde Park, Utah
- **Participation:** 78 Flumes installed, 74 Water Checks completed, 59 households with 2+ weeks data collected, 9 follow-up interviews.
- **561 weeks of data collected**: 189/372 weeks before/after a Water Check.

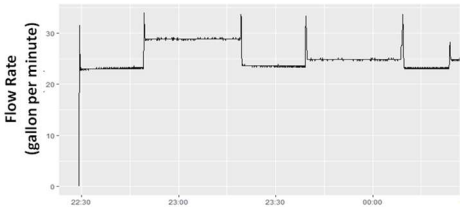

Figure 2. Two-hour irrigation event with 6 zones. Started on August 18, 2022 at 10 pm. Total volume of 3,327 gallons.

Table 1. Reductions in water use

Comparison	Volume (1,000 gal.)
Pre Use minus Post Use	626
Pre Use minus Pre Budget	124
Post Use minus Post Budget	52
Pre Budget minus Post Budget	554

July 6, 2023

BP075

Next Steps

1. We expect more reductions if Water Checks are:
    - Completed earlier in the summer.
    - Targeted towards the largest water users.
    - Continue with monitoring in 2023.
2. Share results with Logan City, Hyde Park, Utah agencies, & Water Conservancy districts.
3. Produce 2 minute video.
4. Present findings at a national conference.
5. Identify how weather conditions effect water savings—conduct follow-on ***controlled*** pre/post Water Check study where ~50% of participants *do not receive* a Water Check.

Box 2. Recommendations to improve Water Check Program

- Include follow-up visit.
- Assess drip irrigation zones.
- Work with home-owner associations.
- Add a 1-page summary to report.
- Share example water-wise landscapes.
- Share contact information for landscape contractors.
- Connect participants to city staff.

Study Team

- **Utah State University:** David E. Rosenberg, Mahmud Aveek, Camilo Bastidas, Jeffery S. Horsburgh, Belize Lane, Kelly Kopp.
- **WaterDM:** Peter Mayer.
- **Flume, Inc.:** Joe Fazio.

Informational Resources

Contact: Dr. David E. Rosenberg, Phone: (435) 797 8689, E-mail: david.rosenberg@usu.edu

Dataset and Code Repositories:

- https://www.hydroshare.org/resource/fe0377e960b741c4a52dc6ea49db7d80/
- https://github.com/cjbas22/HelpUSUExtensionP.

Websites: https://uwrl.usu.edu/water-check-study.

Additional Results

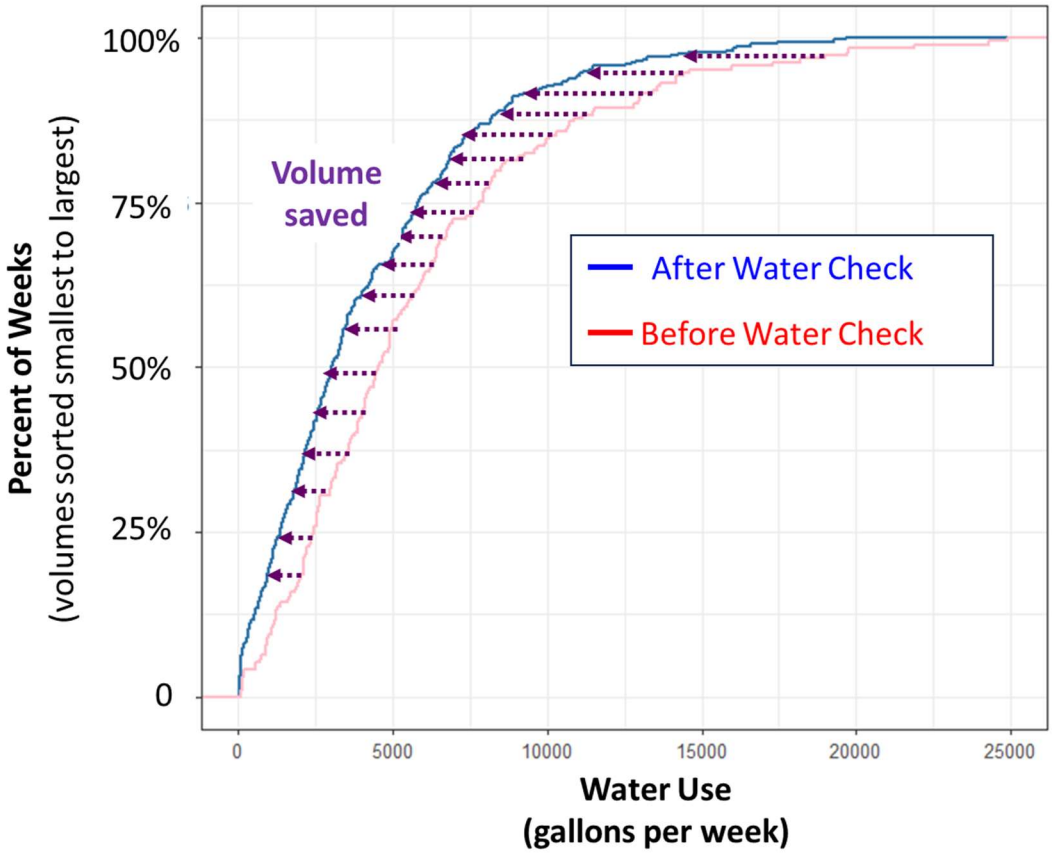

Figure A. Weekly water uses before (red curve) and after (blue curve) a Water Check are sorted by volume smallest to largest. The blue curve shifted left to lower weekly water volumes relative to the red curve (purple dotted arrows). The shift left indicates 626,000 gallons collectively saved by the 59 households that had 2 or more weeks of data before and after the Water Check. The water volume saved is greater than zero with 99.998% confidence.

Table A. Change in median irrigation application depths

Sample (size)	Application Depth (inch)			Significance
	Before	After	Decrease	
Combined (59 hh)	1.0	0.7	0.3	99.998%
Hyde Park (34 hh)	1.0	0.72	0.28	99.3%
Logan (25 hh)	0.86	0.59	0.27	99.9%

Metropolitan Water District of Salt Lake & Sandy
Board Packet Information
Last Update: December 7, 2023

Agenda Item: Environmental Committee reporting items

Background: In 2018 the Environmental Committee developed an objectives summary that represented the spectrum of responsibility assigned to the Environmental Committee. These objectives correlate with the District's overall mission statement. The board finalized the following Environmental Mission Statement in February 2018.

Environmental Mission Statement

Actively promote the long term, sustainable development and wise use of water, energy and other resources under the stewardship of the Metropolitan Water District through conserving water and energy, protecting water quality and the watershed and assuring regulatory and environmental compliance. All actions will take into consideration the relevant goals and activities of the member cities, associated districts, and the state.

On an annual basis, the District will provide an update on efforts to support the objectives of the Environmental Mission Statement. Overall, the District continues to be very active in supporting these objectives. An explanation of these efforts in 2023 is included (Attachment A).

Committee Action: The Environmental Committee reviewed and provided input on the mission objectives during the December 5, 2023 committee meeting. The committee recommended sharing the Environmental Mission Statement and review of objectives for 2023 with the full board.

Recommendation: For discussion and reporting purposes.

Environmental Mission Statement

Actively promote the long term, sustainable development and wise use of water, energy and other resources under the stewardship of the Metropolitan Water District through conserving water and energy, protecting water quality and the watershed and assuring regulatory and environmental compliance. All actions will take into consideration the relevant goals and activities of the member cities, associated districts, and the state.

Water and Energy Conservation

Support water conservation and best management practices for energy and water conservation

1) Support our member cities' implementation of effective water conservation measures
   a) Participate in the Utah State University water audits program
      - District continued to support the Utah State University (USU) Water Audits program during 2023.
      - The annual contract amount for water checks and analysis is $116,000.
   b) Support member cities' conservation programs
      - Support of member cities' conservation programs was through the USU Water Audits program and participation in the Governor's Water Conservation Team.
   c) Participation in the Governor's Water Conservation Team
      - District is a member of the Governor's Water Conservation Team (GWCT) and Annalee Munsey is the District representative on this team.
      - The current annual cost for the District to participate in the GWCT as a funding member is $36,400.
   d) Implement the District's water conservation plan
      - The District's Water Conservation Plan was adopted in December 2005 and the plan was updated in December 2010. Recommended updates to the plan were considered in 2015 but have not been finalized. The District is not required to have a water conservation plan unless it is applying for grant funds that would require a conservation plan. The Environmental Committee did not see the need to update the plan but supported posting the District's Environmental Mission Statement and Objectives on the District's website.
   e) Provide annual Utah Lake System reporting
      - Since 2000, the District has tracked per capita water use which documents conservation performance by the District and its member cities. This information is used to track the District's progress in meeting the ULS conservation goals of a 25% water use reduction by 2050. The District completed its annual conservation report and submitted it to Central Utah Water Conservancy District in March.

f) Support regional water conservation goals
    - In 2019, the Utah Division of Water Resources established regional water conservation goals for Utah's nine municipal and industrial (M&I) areas. The 2030 goals vary by region due to the unique characteristics and needs of Utah's diverse climates and ecosystems. The regional goals constitute a 16% water reduction in per capita use from the new 2015 baseline. The 2015 Salt Lake County baseline is 210 gallons per capital per day (GPCD) and the 2030 Salt Lake County regional goal is 186 GPCD. The regional goals replaced the State's water conservation goals of a 25% reduction by 2025 goal. County Water Conservation Goals

2) Implement effective supply-side conservation measures
    - Bowen Collins & Associates completed a comprehensive water supply and demand study in February 2019. Salt Lake City and Sandy City were involved in similar efforts. The District coordinated efforts with the member cities.

3) Plan and participate in Aquifer Storage and Recovery efforts
    - Consistent with the District's Fiscal and Budget policy, when revenue is available, the District has contributed to the Aquifer Storage and Recovery (ASR) Reserve fund. The current fund balance is $4,460,487.
    - The Managed Aquifer Recharge Design and Construction capacity improvement project is in progress. The District's 2021 Managed Aquifer Recharge (MAR) Implementation Plan includes a six-phase approach to storing up to 8,790 ac-ft of water annually in the ground. The District successfully obtained funding from the American Rescue Plan Act (ARPA) to construct portions of the first two project phases (pilot and Phase 1) which are anticipated to include surface infiltration basins and an aquifer injection well. Construction of five monitoring wells, one injection well, and two surface infiltration basins are nearing completion.

4) Adopt best management practices for energy and water conservation at all District lands, properties, and facilities
    a) Implement the District's Energy Management Plan
        - Consistent with recommendations from the Emergency Management Plan, the District created an Energy Management Team. The team includes staff from Engineering, Maintenance, I&E, and Operations. The team meets quarterly to evaluate and consider the development of renewable energy sources, such as solar, either as independent capital improvement projects, or in conjunction with the implementation of other capital improvement projects.
    b) Evaluate other energy and water conservation BMPs
        - The District will continue to improve energy conservation through proactive operational/maintenance changes and through replacing failing equipment with energy efficient options.
        - The District is eligible to receive funding from Rocky Mountain Power for proactive projects that improve energy conservation.

5) Promote public education regarding water conservation
   a) Participate in public outreach through events such as Water Week
      - Water Week activities were not planned in 2023. However, tours of the LCWTP resumed. On April 14, 2023, staff provided a tour to participants in Salt Lake Chamber's leadership program called "Leadership Utah." Other small groups have toured the plant.

Water Quality Protection

Support District's mission to provide high quality water to our customers

1) Monitor and respond to harmful algal blooms in source water reservoirs
   - The District's Harmful Algal Bloom (HAB) and Cyantoxin Response Plan, last updated in October 2021, continues to direct efforts to prevent HABs through source protection endeavors, to monitor for HABs through a cooperative effort with the Provo River Watershed Council, and to respond to reports of HABs when they occur.
2) Monitor and respond to aquatic invasive species such as quagga mussel
   - District continues to monitor aquatic invasive species, especially quagga mussels. As a part of this effort, the District provides funding for the Aquatic Invasive Species (AIS) program through the PRWC. Casey Silva, the new AIS Coordinator, provided an update on the AIS program at the most recent PRWC Stakeholder Meeting.
3) Monitor and respond to the introduction of new water supplies in District conveyance and distribution systems
   - District has coordinated quarterly meetings with Jordan Valley Water Conservancy District and Salt Lake City Public Utilities to discuss potential water quality issues or concerns with deliveries through the Jordan Aqueduct facilities to 21st South. The most recent meeting was held on October 27, 2023.
4) Monitor and respond to introduction of PFASs (perfluoroalkyl substances)
   - Since October 2019, the District conducts quarterly testing for PFASs (perfluoroalkyl substances) in Little Cottonwood Creek. The District has also been conducting PFAS monitoring as part of a project lead by the Division of Drinking Water. There have been a few detections of PFAS compounds in the source waters but no PFAS compounds have been detected in the finished water. On March 14, 2023, the EPA announced the proposed National Primary Drinking Water Regulations for six PFASs substances.

Watershed Planning and Protection Program

Support District's mission to effectively manage valuable resources and promote the sustainable use of water resources

1) Implement and maintain the District's source water protection plans
    - The District maintains source water protection plans for the following water sources: Provo River, Little Cottonwood Creek, Southeast Mountain Streams, Battle Creek, and Grove Creek.
    - The District has coordinated efforts with Central Utah Water Conservancy District and Jordan Valley Water Conservancy District on the Provo River source water protection plan. Every six years the source water protection plans are reviewed. These plans were updated in December 2019.
2) Participate in watershed planning programs and efforts to protect the watershed
    a) Support Provo River Watershed Council
        - District is a member of the Provo River Watershed Council (PRWC). Eric Sorensen is the District representative on this council.
        - The current annual cost for the District to participate in the PRWC as a funding member is $100,000.
    b) Support Central Wasatch Commission (formerly Mountain Accord) efforts
        - District continues to support the Central Wasatch Commission (CWC) efforts.
        - In 2022, Annalee was elected as an ex-officio board member of the CWC and represents the District on the board. The annual contribution is $15,000.
        - The CWC funded a Central Wasatch Visitor Use Study to evaluate Millcreek Canyon, Big Cottonwood, and Little Cottonwood canyons. After two years of study and multiple phase reports, the Central Wasatch Commission released the final phase report associated with its Visitor-Use Study.
        - The data collected through the Visitor Use Study have been integrated into the Central Wasatch Commission's Environmental Dashboard, serving as the foundation for a sixth, "human" element, providing insight to any impact that human recreation in the Central Wasatch Mountains may have on the environment. The human element incorporates data that reflect the temporal and spatial dynamics of outdoor recreation use within Little Cottonwood Canyon, Big Cottonwood Canyon, and Millcreek Canyon. The online tool is available at CWC Environmental Dashboard (utah.gov)
    c) Monitor and respond to legislative threats to watershed protection
        - District staff continues to monitor potential legislation that relates to protection of drinking water sources. Staff and the District's lobbyist track these bills and attend meetings, as needed.
        - The District has representation at The Utah Water Task Force (UWTF) monthly meeting. UWTF has provided input on water banking, watershed councils, watershed protection, water conservation, water rights, and other water-related legislation.

d) Monitor and respond to developments in the watershed
    - District continues to monitor development in the watershed areas. On a monthly basis, District staff develop a report on potential development activity in the Provo River watershed and provide it to Sandy Wingert, Upper Provo and Jordan River Coordinator at the Division of Water Quality. This report is also shared with the Provo River Watershed Council.
e) Consider monitoring other watershed areas that have a potential impact on District source water supplies
    - The council utilizes SWCA Environmental Consultants to provide engineering services for Provo River Watershed Water Quality Analysis. SWCA developed an interactive Provo River Watershed Story Map.
    - Also, Barr Engineering provides professional engineering services for the review of development (construction) plans. Barr Engineering is also conducting routine observations of stormwater collection systems for the purpose of protecting surface water quality.
f) Consider and understand the implications of climate change to the District and its customers
    - District engaged Bowen Collins & Associates to complete a comprehensive water supply and demand study, which included an analysis of climate change implications. This study was completed in February 2019. Salt Lake City and Sandy City were involved in similar efforts. The District coordinated efforts with the member cities.

Regulatory Compliance

Recommend practices and programs that ensure regulatory compliance with the Division of Drinking Water and EPA

1) Monitor and respond to changes in water quality regulatory compliance requirements that may impact water treatment processes as well as practices of the District's certified lab
    a) District completed Sanitary Survey
        - The IPS rule (Improvement Priority System) is an approach to evaluating and rating water systems. Ratings are in accordance with the Rule R309-400 – Water System Rating Criteria. The three possible ratings are: Approved, Correction Action (system deficiencies are in the process of being corrected), and Not Approved (significant deficiencies exist).
        - The District's water system was evaluated on June 20, 2023. A copy of the survey is available if board members are interested. The current rating is "Approved" and we received a 0 point score, the best score available. The next survey will be conducted in 2026.

Environmental Compliance

Recommend action to the Board regarding environmental compliance

1) Participate in NEPA compliance reviews as needed

- District has participated in two UDOT Environmental Impact Statement (EIS) National Environmental Policy Act (NEPA) processes. The Parley's Interchange EIS (near Terminal Reservoir) has been completed. The District has provided comments as well as Salt Lake City and Sandy on the Little Cottonwood Canyon EIS.
- In July 12, 2023, UDOT released the Little Cottonwood Canyon EIS Record of Decision for transportation improvements. UDOT selected Gondola Alternative B with phased implementation of components of the Enhanced Bus Service Alternative. Staff provided comments throughout the EIS process.
- Staff provided comments on the Wasatch Front Regional Council draft 2023 Regional Transportation Plan.