

WATER ELEMENT

Introduction

Water in Utah

We live in a semi-arid State that has experienced a significant amount of growth over the past 30 years; and it is expected to continue through 2050. A majority of the growth in Utah has occurred along the Wasatch Front, including Ogden. Throughout the State, we have made changes to conserve water, a valuable resource, by regulating landscapes and limiting wasteful water use.

Our outdoor water use is reducing the flow of water into the Great Salt Lake. In the past, this was not considered an issue, but the dry lakebed poses potential health risks to communities along the Wasatch Front. The dry lakebed contains arsenic and lithium that could be exposed and transported through the wind if the Great Salt Lake's water levels are not managed properly. Each city in the region has a responsibility to do their part to use water responsibly.

In 2022, the State Legislature recognized the need to address the state's water use practices and required that General Plans include a Water Element/chapter to assess the water capacities and practices within cities and counties. State Law 10-9a-403 was created with the following objectives:

1. Analyze the effect of permitted development or patterns of development on water demand and water infrastructure.
2. Consider methods of reducing water demand and per capita water use for existing development.
3. Consider methods of reducing water demand and per capita water use for future development.
4. Evaluate modifications that can be made to a local government's operations to reduce and eliminate wasteful water practices.

Water in Ogden

Ogden's residents, businesses, and institutions receive water from several sources. The largest source in Ogden's municipal water system is wellfields near Pineview Reservoir and Pineview Reservoir itself. Ogden is also served by a variety of water districts, primarily providing secondary water.

All Utah water providers that provide a certain number of connections are required to develop a Water Conservation Plan and assess its effectiveness every five years. Those plans describe the water system and its capacities, leakage, usage, and goals for the water district. Those goals include a plan for water use reduction and implementation, yet water district plans and city ordinances may not reflect the same goals. Essentially, that is the purpose of this Water Element—greater coordination between the providers and the city. Water districts do not have the ability to require certain types of landscaping or direct other goals and policies, but cities do. Coordination and collaboration between water providers and the city is necessary to address mutual conservation goals, ensure water supplies for planned future users, and replenish the Great Salt Lake.

On May 15th, 2025, Ogden hosted a coordination meeting with major water districts and big water users in the Ogden area. The intent of that meeting was to create an understanding of how the city's General Plan goals and ordinances could address the water conservation expectations of the State legislation. The providers that attended the meeting included:

- Central Weber Sewer District,
- Dixon (State Water),
- Bona Vista Water,
- Weber Basin Water Conservancy District,
- and Ogden City Water including the City's Water Conservationist.

Major water users and water managers also attended, including:

- City Parks,
- City Public Works,
- City Storm and Sewer,
- City Building Division,
- City Attorney,
- City Planning,
- Weber State University,
- and McKay Dee Hospital.

A State Division of Natural Resources representative also attended.

The providers, big water users, and managers attended the meeting to share information about any supply issues and discuss what each agency is doing to promote conservation. The conversation provided additional context and highlighted key considerations for the Water Element in this chapter.



The State records water use and supply data through the Division of Water Rights:

https://waterrights.utah.gov/asp_apps/generalWaterUse/WaterUseList.asp

Culinary Water System

Ogden City's *2018 Culinary Water Master Plan* (CWMP) provides a comprehensive evaluation of the city's culinary water system and a roadmap for supporting long-term growth and infrastructure needs through the year 2050.

The city's culinary system is complex, comprising nine pressure zones and three major water demand areas. Water is delivered through a gravity-fed network supported by a series of booster stations, storage tanks, pressure reducing stations, and more than 370 miles of water pipeline. The system sources its water from three main sources: groundwater from wells, surface water drawn from Pineview Reservoir and Wheeler Creek, and treated water purchased from Weber Basin Water (this provider uses a combination of ground and surface water from wells and the Weber River). Weber Basin and Pineview also provide secondary irrigation to parts of the city (shown in Figure 1) making secondary water accessible to 37% of residences.

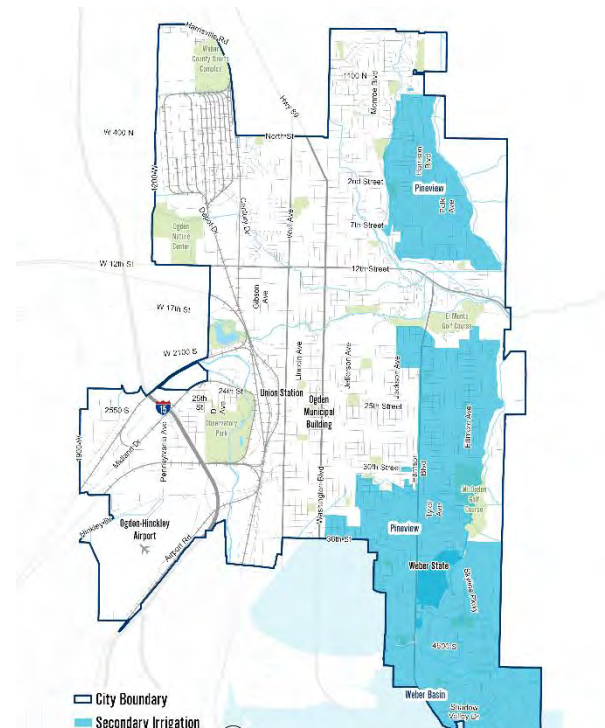


Figure 1. Secondary Irrigation Service Areas
(Source: Ogden City)

To prepare for future growth, the CWMP identifies critical improvements through a culinary water-specific capital improvement plan. These priority improvements include developing new wells, upgrading storage facilities, replacing aging cast iron and ductile iron pipelines, and improving pressure and fire flow capabilities across the system. The plan calls for over \$100 million in capital investments over 40 years to address aging infrastructure and future demand.

In addition to infrastructure upgrades, the CWMP recommends continued focus on water conservation, leak detection, and meter accuracy. Ogden has made significant progress in reducing water loss. Water loss has been cut in half from 31.8% in 2015 to 14.3% in 2024. See Figure 2. Continued efforts are needed to reduce waste and stretch existing resources.

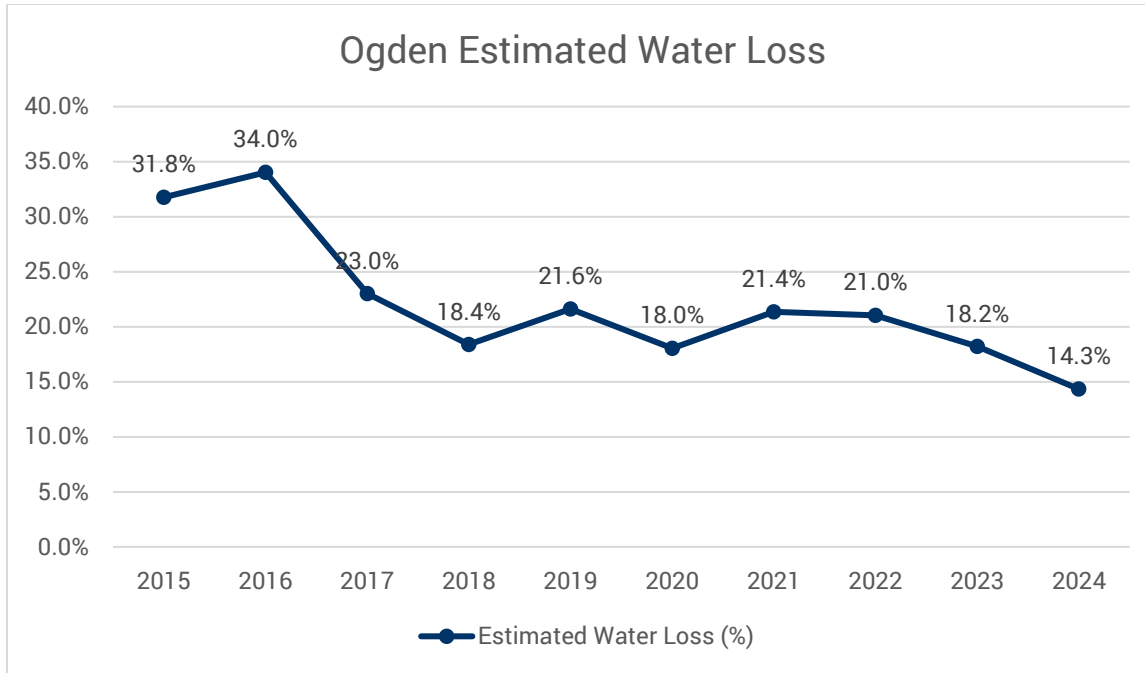


Figure 2: Ogden Water System Estimated Water Loss, 2015-2024. (Source: Utah Division of Water Resources Public Water Supply Use Forms for Ogden City, 2015-2024)

Water Supply

Ogden City’s main water supply is generated from the Pineview Reservoir, but a variety of sources currently feed their overall supply system. Ogden City Water has significant supply and water sources as per the following table (MPD is millions of gallons per day):

Table 1. Summary of Ogden’s Culinary Water Sources	
Source	Capacity
Pineview Wells	14.9 MPD
Taylor Canyon Well	1.44 MPD
Treatment Plant	13.5 MPD
Weber Basin Water Conservancy District (WBWCD)	11.95 MPD
Total	41.79 MPD

Source: Ogden City Water Conservation Plan, 2019

Current Water Use

Water Use and Population Growth

Over the past decade, Ogden’s population has grown by 4,200 people or 5%. Despite this growth, due to conservation and system maintenance, Ogden’s water use has decreased by about 3%. See figure 4 below.

Ogden Water Use and Population, 2014-2024

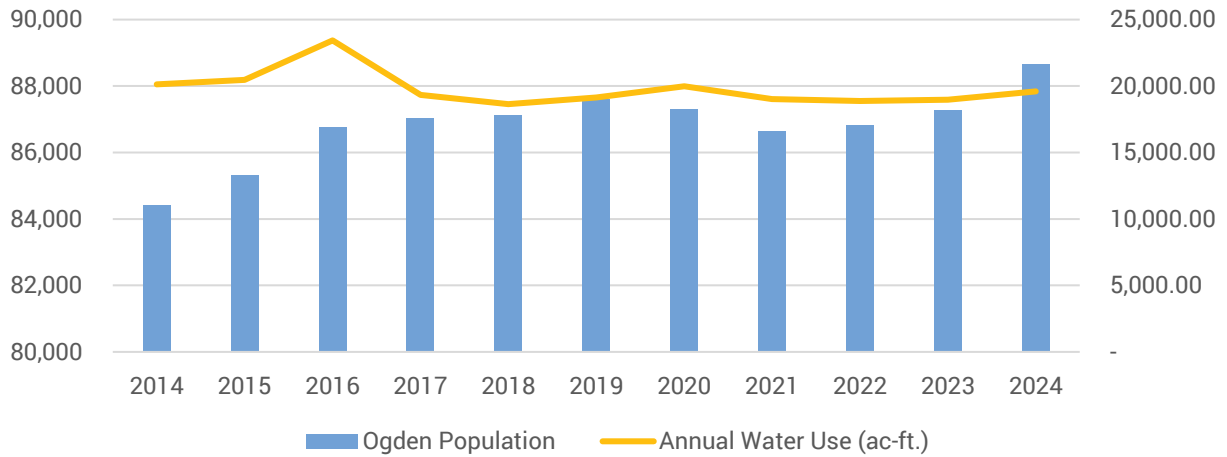


Figure 4: Ogden Water Use and Population, 2014-2024. (Source: Utah Division of Water Rights Public Water Supplier Information for Ogden City. Population data is U.S. Census Bureau annual population estimates for Ogden City.)

Ogden’s 2019 Water Conservation Plan reports that water use per capita was 193 gallons per capita per day (gpcd). This was a reduction from 200 gpcd in 2014. This number is somewhat misleading, however, because Ogden has several wholesale agreements with surrounding water providers and about 7% of its water serves customers outside Ogden. When this wholesale amount is deducted, the true water use in Ogden in 2024 was 184 gallons per capita. See Figure 5.

Ogden Water Use In Gallons Per Capita Per Day, 2014-2024

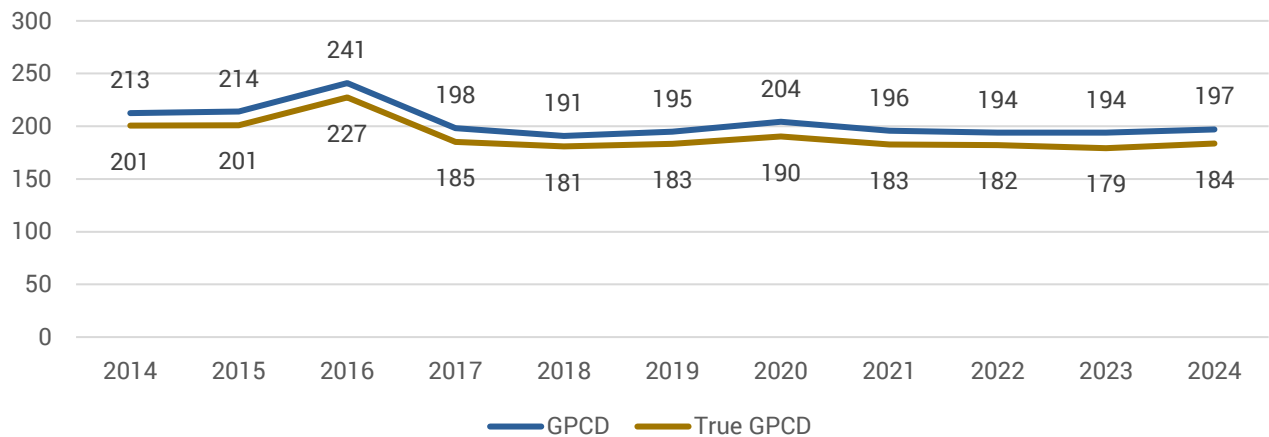


Figure 5: Ogden Water Use in Gallons per Capita per Day, 2014-2024. (Source: Department of Water Rights, 2025)



Water Use by Land Use Type

Almost half (49%) of Ogden’s metered culinary water was for residential land uses. The second highest was for commercial land uses (26%). Industry was the third largest land use (14%), and institutional uses such as schools, hospitals, and secondary education, and public and private open spaces, such as golf courses and parks, was the lowest (11%). See Figure 6 and Table 2. Note that these totals exclude water loss and wholesale water.

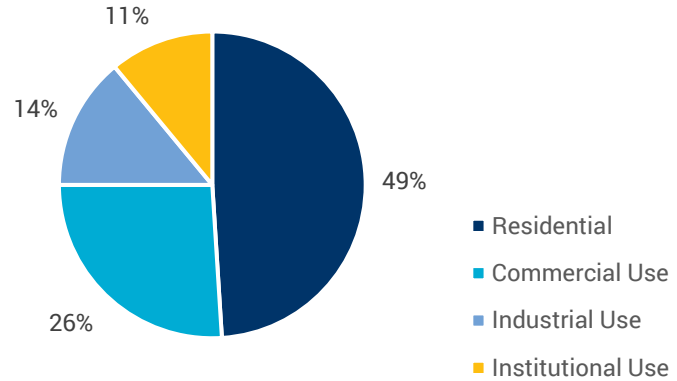


Figure 6. Culinary Water Usage by Land Use Category (Source: Ogden City, 2024)

Table 2. Ogden Retail Culinary Water Use by Land Use Type (2024)			
	Retail Annual Quantity (MGal)	Number of Connections	Percent of Total Use
Residential	2,443.01	23,741	49%
Commercial	1,314.74	1,750	26%
Industrial	725.66	119	14%
Institutional	546.49	388	11%
Total	5,029.91	25,998	100%

Figure 7: Ogden Annual Water Use by Land Use Type, 2015-2024. (Source: Utah Division of Water Rights Public Water Supplier Information for Ogden City)

Trends in Water Use

Over the past decade, Ogden has decreased total water use by 3% (see Figure 4). As shown in Figure 2, Ogden has cut water loss in half from 31.8% in 2015 to 14.3% in 2024. During this time, metered use has increased 21%. The largest growth in metered water use is in institutional use, which has increased by 410% during this time. This is a strong indication that Ogden has been successful in better accounting for water use through meters, in particular institutional uses, rather than indicating disproportional increase in water use.

Over that past decade, Ogden’s population has grown by 5% and residential water use has increased by 22%. While some of this increase can be attributed to better water metering, it is also possible that residential water use per capita is increasing, especially for use in residential landscapes.

Over the past decade, commercial water use has increased 13%, which, along with better metering, is reasonable given the commercial growth during that time. Industrial use has decreased by 16%.

Future Water Use

As Ogden grows, so will its demand for water. This plan forecasts that Ogden will grow to a population of 108,000 by 2050, adding 12,000 new households. The plan also forecasts Ogden will add 19,000 new jobs and new institutions, including 78.1 acres of new park land.

It is anticipated that under standard land use and population increases, demand will increase over time. The anticipated number of water connections by land uses are shown in Table 3. This table includes the projections from the City's Water Conservation Plan and an updated projection based on Plan Ogden's population and employment projections².

The General Plan reflects a change in employment and household projections based on the Future Land Use Map that mirrors the city's vision. The General Plan also projects a per capita water use of 183 gallons per capita per day by the year 2050. This per capita use goal is based on the Ogden Water Conservation Plan, which highlights a goal of 175 gpcd by 2065. The Water Conservation Plan and this plan emphasize tactics that the city can take to reach this water use goal. While growth, both economic and population growth, add new connections and demand to the system, conservation efforts can reduce the need to expand water sources and storage projects which can be costly and detrimental to Utah's incredible environment. The analysis to follow highlights both the anticipated growth and the anticipated water use based the anticipated

Projecting water use requires two sets of considerations.

1. The first consideration is how many new connections, and what types of connections, are anticipated. The Plan Ogden Future Land Use map provides a picture of the types of uses and how many additional residential, commercial, industrial, and institutional uses may be added across the city by the year 2050.
2. The second consideration is how water use per capita will change over time. Water use by person and by business is affected by individual behaviors, as well as by certain land use characteristics. For example, multi-household units or smaller lot single-household units have relatively less landscaping water use, because there is less space to irrigate.

² The 2025 update to the Water Conservation Plan assumes a higher population growth rate than the General Plan population forecast. This ensures adequate planning for future water infrastructure needs, even under higher growth scenarios.



growth. Table 3 highlights the growth that is anticipated based on the Plan Ogden Future Land Use Map.

Year	Residential	Commercial	Industrial	Institutional	Total
Plan Ogden 2050	42,219	33,325	16,822	4,157	96,523

Source: Plan Ogden population projections and Future Land Use Map

The numbers shown in Table 3 are Equivalent Residential Unit (ERUs). An ERU is a standardized unit used to measure the impact of different properties, especially non-residential units on a water system. This analysis also includes ERU assumptions about multi-household units, for example, apartments which have relatively less water use for landscaping are use approximately 70% of the water that a standard single-household unit uses. ERUs are based on regional water use for different land uses, metered connections for similar uses and other plans and can be found in Table 4.

Land Use	ERU	Unit Measure
Typical single-family (<8.8 du/ac. R-1)	1.0	per dwelling unit
Small-lot single-family (<5,000 sf lots, 8.8-12.0 du/ac.)	0.9	per dwelling unit
Low rise apts, townhomes (1-3 story, 8-20 du/ac.)	0.7	per dwelling unit
Mid-rise apts (3-6 story apts, 21+ du/ac.)	0.7	per dwelling unit
General Commercial/Office	6.6	per developed acre
Downtown Commercial/Office	16.4	per developed acre
Institutional (schools, churches, not parks)	2.5	per developed acre
Parks	6.4	per developed acre
Industrial	6.8	per developed acre

The ERUs in Table 4 were applied to the Plan Ogden Future Land Use map. Many future land uses are applied directly; for example, any parcel in the Low Density Residential category is classified as a “Typical single-family” and assigned one ERU. For other mixed use categories that have both residential and employment uses combine usage types shown in Table 4. For example, the “Downtown” future land use utilizes the “Mid-rise apts (3-6 story apts, 21+ du/ac.)” ERU of 0.7 for dwelling units associated to that parcel, and the “Downtown Commercial/Office” ERU of 16.4 for developed employment acres for that parcel. This provides



the most accurate prediction for the number of ERUs that are anticipated if the city develops as the Future Land Use map indicates.

Building on the ERU calculations, we can generally predict daily water usage for all parcels for an estimate of total daily water usage citywide in “gallons per day”, and for the annual estimate, the daily usage is multiplied by 365 to reflect the usage in one. Final numbers for Ogden’s 2050 Water Usage can be found in Table 5.

Table 5. Ogden Water Use Projections		
	2050 Ogden Business as Usual	2050 with Water Conservation
Water Usage Millon's of Gallons Per Day	21.7	20.5
Water Usage Millon's of Gallons Per Year	7,914.1	7,485.1

Source: Plan Ogden population projections and Future Land Use Map

Based on these predictions, water demand, assuming conservation goals are met, will consume approximately 50 percent of the water resources currently available by 2050 (41.79 MGD; 15,253.35 Mgal). Absent conservation, the city still has water resources to support the expected growth in employment and households. However, the city as part of the region should strive to meet their own conservation goals to ensure the health of the Great Salt Lake and to protect future generations. This only includes water use for land uses within the city boundary. This projected use does not include wholesale use in other cities or the surrounding county.

Using the Future Land Use Map and the anticipated employment and households associated with each of these, it is possible to see approximately where the City can anticipate high water use. Many institutional uses, like parks or golf courses use a relatively large amount of water, industrial uses are also considered heavy water users and are located on the west side of the city. Higher intensity areas like downtown have a high concentration of residents and commercial uses, thus these areas use relatively more water in a smaller area, however the per capita use here tends to be lower because many of the units are multi-household or small-lot residential.

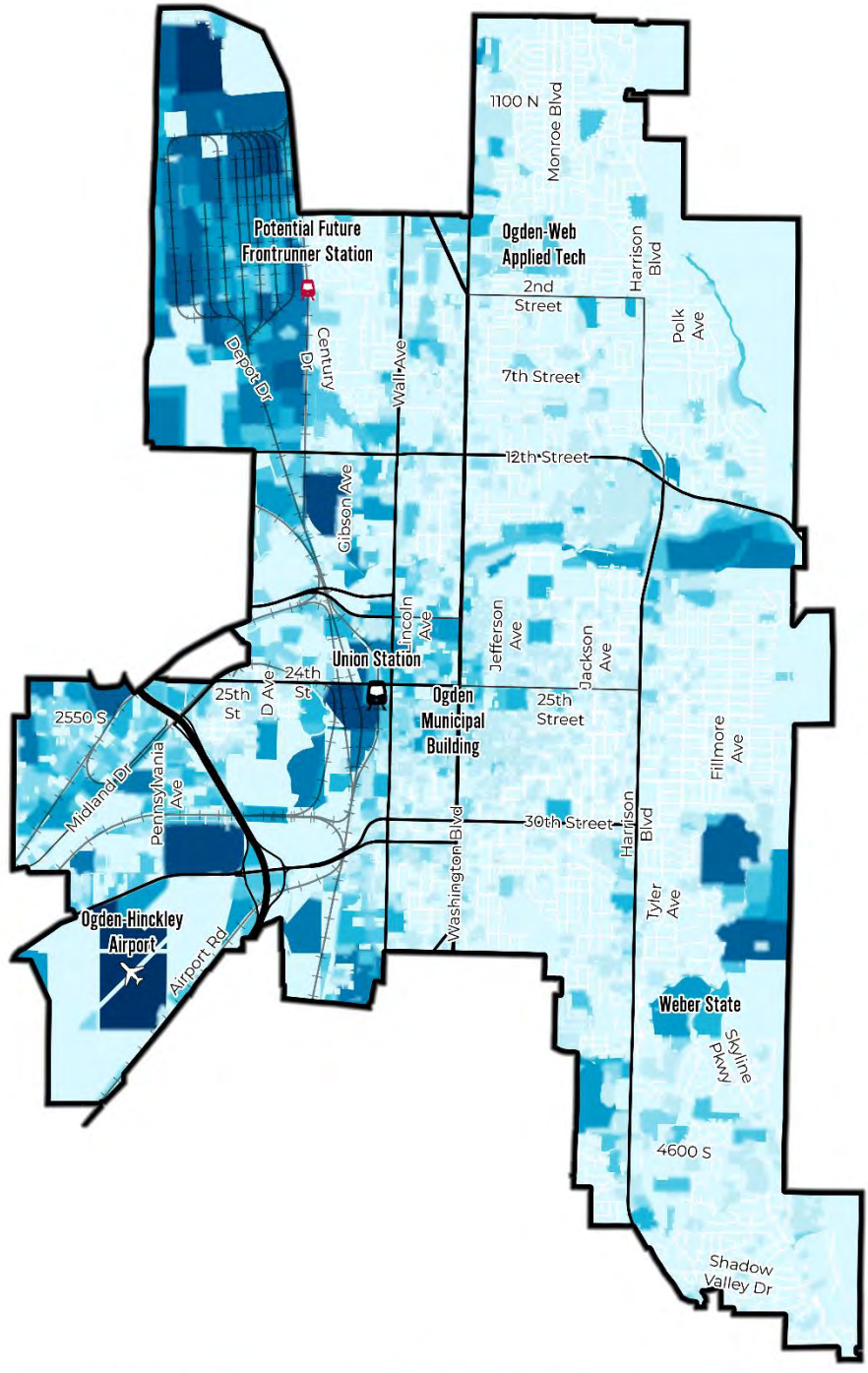


Figure 7. Water Demand Projections 2050



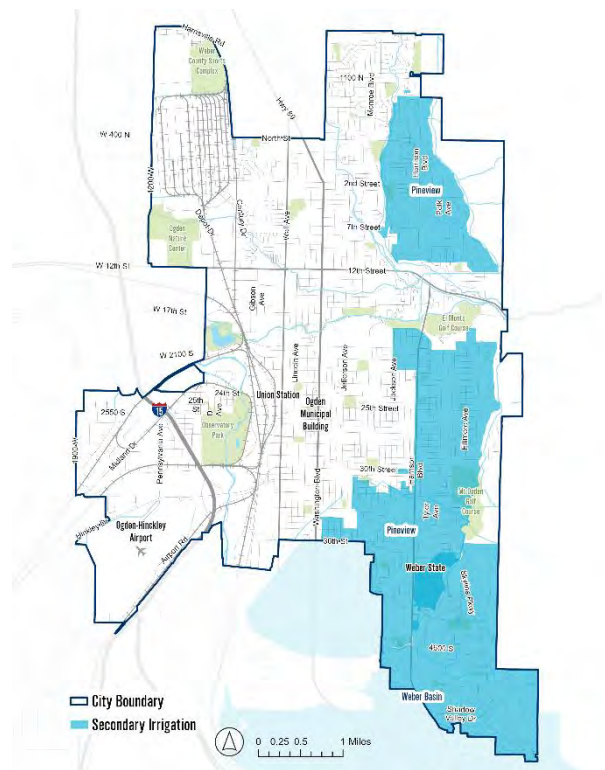
Secondary Water Systems

Secondary water refers to untreated irrigation water delivered through a separate system (independent of the culinary water system) for outdoor use such as watering lawns and gardens. In Utah, roughly 60% of residential water use is outdoors on landscaping. Using secondary (non-potable) water for irrigation instead of treated drinking water helps conserve the city’s potable supply for indoor and essential uses. Secondary water is typically drawn from local rivers, reservoirs, or canals (for example, Pineview Reservoir on the Ogden River) and is delivered during the irrigation season (usually April through October). Because it’s untreated, secondary water costs less to supply and avoids the expense of full treatment just for watering lawns. In practice, secondary water is provided to many Ogden neighborhoods through a pressurized pipe network (for sprinkler systems), or in some older areas via open ditch systems. This separate infrastructure means that during summer months, many Ogden residents switch on their sprinklers with secondary water, reducing demand on the city’s culinary water system.

Current Secondary Water Providers in Ogden:

Ogden City itself does not own or operate a secondary water utility – instead, service is provided by regional irrigation companies. Several entities supply secondary water within Ogden City limits:

- Pineview Water Systems** – Pineview Water Systems is the primary provider of pressurized secondary water in Ogden. Pineview Water Systems is a consortium that includes the Ogden River Water Users’ Association, South Ogden Conservation District, and Weber-Box Elder Conservation District. It delivers untreated water (from sources like the Ogden River/Pineview Reservoir) to a large portion of the city’s homes for outdoor irrigation. Pineview’s system is active seasonally, typically spring through fall. Residents connected to this system pay an annual flat fee for secondary water service.
- Weber Basin Water Conservancy District** – Weber Basin is a regional water supplier that also provides pressurized secondary water to parts of Ogden. Weber Basin operates one of the largest secondary irrigation systems in the nation and serves many



communities in Weber and Davis Counties. In Ogden, Weber Basin's secondary network supplements Pineview's coverage, ensuring some neighborhoods have access to irrigation water from Weber Basin's system (drawn from the Weber River basin). Like Pineview, Weber Basin's secondary water is non-potable and delivered seasonally to connected properties.

- **Private Irrigation Ditch Companies** – In addition to the two pressurized systems above, a number of small private ditch companies still operate within Ogden, delivering secondary water through canals or piped ditches to specific areas (often older neighborhoods). These include companies such as Dinsdale Ditch, Glenwood Irrigation, Lynne Ditch, Western Irrigation, and several Mound Fort ditch companies among others. These ditch companies supply “raw” water, often diverted from local creeks or canals, that property owners can use to flood-irrigate lawns or gardens or sometimes hook into private sprinkling systems. While each individual ditch service area is small, collectively they form an important part of Ogden's secondary water supply, especially in areas not reached by the pressurized systems. About 3% of Ogden's culinary water customers use these traditional ditch irrigation shares for their outdoor watering.

Secondary Water Coverage and Usage

Secondary water is widespread in Ogden but not universal. Approximately 34% of residential parcels in Ogden have access to pressurized secondary irrigation service. In practical terms, this means nearly half of the homes in the city can water their lawns with untreated irrigation water instead of culinary water. Adding the areas served by open ditches, roughly 37% of properties citywide have some form of secondary water supply available, either pressurized or ditch. The remaining 63% of Ogden residents do not have secondary water and must use drinking water for outdoor watering. These areas tend to be older central neighborhoods or other parts of the city where secondary infrastructure was never built. Ogden City encourages developers and neighborhoods to connect to secondary water where it is available.

Overall, secondary water usage, where available, substantially reduces strain on Ogden's drinking water system, especially during peak summer demand. It allows the city to reserve its treated potable water for indoor use and essential needs, while cheaper untreated water handles a large share of the irrigation demand.

Future Secondary Water Use

As Ogden grows and water use demand increases, the role of secondary water in the city's water system will increase in importance. Expanding secondary water service to new development is one strategy to achieve this. New subdivisions and annexed areas are typically required or encouraged to include secondary water infrastructure if a supply source is available, ensuring that outdoor irrigation demand from those uses won't burden the culinary

system. This means the percentage of Ogden residents with secondary water could gradually increase over time as new connections are added. However, retrofitting secondary service into fully built-out older neighborhoods is costly and likely to remain limited.

A major upcoming change in secondary water management is metering. Historically, secondary water in northern Utah has been provided for a flat fee without meters, but that era is ending. State law now requires all secondary water connections to be metered by January 1, 2030. This legislative mandate (2019's House Bill 242/SB 251) was enacted to promote water conservation, as studies have shown that when secondary users learn how much water they're using, they tend to cut back significantly. In compliance with this law, the irrigation districts serving Ogden have begun installing meters on every secondary water connection .

Pineview Water Systems and Weber Basin are accelerating meter installations throughout their Ogden service areas, rolling them out in phases over the next few years. By 2030, every secondary water customer in Ogden is expected to have a meter tracking their usage. This will likely be accompanied by new rate structures, such as tiered or volumetric charges for secondary water. This new metering system will replace the old flat fees, bringing more accountability for outdoor water use. For residents, it means the days of excessive water use for a flat fee are coming to an end. The upside is that metering is projected to save significant water and stretch the city's limited water supplies further.

Water Conservation

While Ogden has a generous water supply system, its sources are not unlimited. An important strategy for Ogden will be to use water wisely, limit waste, and reduce overall use. This can be done through a combination of limiting water loss in the system and reducing typical water use.

Limit Water Loss

Ogden City's culinary water system currently experiences significant distribution water loss. These losses are attributed mainly to leaking pipelines and unmetered uses in the system. Ogden has made significant progress in this area, reducing water loss from 31.8% in 2015 to 14.3% in 2024. Continuing to reduce this water loss is a high priority in Ogden's water plan, both to conserve precious water resources and to improve system efficiency.

The primary cause of Ogden's water loss is its aging water distribution infrastructure. A significant portion of the city's 359 miles of water mains was installed in the mid-20th century, and many pipes are now reaching the end of their useful life. Industry research shows that pipe condition declines rapidly after about 60–100 years, and Ogden's 2018 Water Master Plan identified a high percentage of pipes in these older age categories. As pipes corrode, break, or suffer joint failures, they leak increasing amounts of water. Past system data show that repairing leaks and failing mains has already yielded noticeable benefits

Replacing the Ogden Canyon Water Lines

Another challenge contributing to water loss was the condition of Ogden's major transmission lines from the Ogden Canyon. The city relies on supply from Pineview Reservoir and wells in Ogden Valley, conveyed to town through two large pipelines (24-inch and 36-inch diameter) running down Ogden Canyon. These critical mains – some nearly a century old – became a major source of leakage. A detailed engineering study in 2009 inspected the canyon lines and found that the older 24-inch Ogden Canyon pipeline was in poor condition with 15 leaks (including 12 classified as large) along its length. By contrast, the parallel 36-inch line was in better shape. The cumulative leakage from the failing 24-inch main was substantial, reducing the efficiency of Ogden's water delivery.

Replacing the Ogden Canyon water line has been – and continues to be – a cornerstone of Ogden's strategy to curb water loss. In response to the 2009 study findings, the city undertook a full replacement of the old 24-inch canyon pipeline in the winter of 2012–2013. This project removed a nearly 100-year-old line that had been leaking heavily. The benefits were immediate and dramatic: City officials report that eliminating the old 24-inch line's leaks saved on the order of 2–3 million gallons of water per day that were previously being lost. In other words, replacing that single aging pipeline reduced Ogden's non-revenue water by an estimated 2+ MGD, significantly improving overall system efficiency.

Building on that success, Ogden City is currently focused on the 36-inch Ogden Canyon pipeline, the primary feed line which also dates to the 1930s. While this larger main was judged to be in relatively good condition in 2009, it is beyond its life expectancy and has started to experience substantial water loss as well. The 36-inch line is a critical supply artery, conveying water from the wellfields near Pineview to the 23rd Street reservoirs in Ogden, so its failure or leakage has major implications for water loss and reliability.

To address this, Ogden has launched a once-in-a-generation Canyon Waterline Replacement Project to fully modernize the 36-inch transmission line. The project, funded by a combination of federal EPA loans, state funds, and city capital, is approximately a \$100 million investment and is anticipated to be completed by 2029. This will essentially replace or rehabilitate the remaining old canyon mains, including segments under Pineview Reservoir, with new, state-of-the-art pipeline. City engineers expect that completing the 36-inch line replacement will eliminate millions of gallons per day of current water losses, much like the 24-inch line project did. In addition, it will ensure a more reliable water supply for Ogden's customers by preventing the frequent leaks and repairs that have increasingly burdened the old line.

Ongoing Measures to Limit Water Loss

Beyond the canyon pipelines, Ogden City is implementing a comprehensive water loss control program throughout its distribution system. The city's 2019 Water Conservation Plan and 2018

Water Master Plan outline several ongoing and future initiatives aimed at finding and fixing leaks, improving infrastructure, and tightening accounting of water use. Key measures include:

- **Active Leak Detection and Repair:** Ogden has established an annual leak detection survey program to systematically find hidden leaks in the distribution network. Each year, a specialized leak-detection contractor and city staff focus on a section of the water system deemed at high risk for leaks (based on pipe age, material, soil conditions, or past break history). Using acoustic sensors and other technology, they test and pinpoint leaks in that area. Any leaks discovered are promptly repaired by city utility crews. The plan is to rotate these surveys so that over a decade, most of the city's pipes will be examined and previously undetected leaks can be caught early. This proactive approach prevents small leaks from growing and addresses losses before they contribute to major water waste or main breaks.
- **Aggressive Pipe Replacement Program:** Ogden is ramping up its capital replacement of aging water mains to steadily modernize the system. Industry best practice (and Ogden's own policy) calls for replacing roughly 1.2% of the distribution network per year. At 1.2% annually, the city can renew a pipe before most reach failure age, spreading out costs and preventing a spike of end-of-life failures. Even when replacement of an entire line isn't immediately feasible, the city is also investing in pipe rehabilitation, such as lining and sealing as interim measures to extend life and curb leaks.
- **System Pressure Management:** High or fluctuating pressures can exacerbate leaks and pipe bursts. Ogden has been upgrading its pressure regulating valves (PRVs) and optimizing pressure zones to reduce stress on pipes. In 2005, an evaluation led to replacing 11 deteriorated PRVs and adding 3 new PRVs to better control pressure transitions. This effort led to a significant drop in leaks caused by pressure fluctuations. The city continues to replace aging PRVs and consolidate pressure zones where possible, providing more consistent pressure and protecting the integrity of the distribution system. Stable pressures mean fewer pipe bursts and less water lost to sudden main breaks.
- **Advanced Metering and Water Audits:** Complete and accurate metering of all water connections is critical for identifying and reducing "accounted-for" losses. Ogden City has upgraded nearly all water meters to radio-read technology and is ensuring that every service connection is metered. Modern meters improve billing accuracy and help detect customer-side leaks or unexplained usage spikes (through flags in the billing system). Ogden recently undertook a citywide water loss audit following AWWA guidelines, earning a performance/validity score of 59 out of 100. The city's goal is to improve its water audit score to 70/100 by 2040, reflecting more rigorous tracking of

water and reduction of losses. Achieving this will involve meter calibration, accounting for all usage (including municipal uses, fire-fighting, etc.), and eliminating unauthorized consumption – all of which bolster the effort to cut non-revenue water.

Response to Climate and Drought Considerations

Climate extremes have been prevalent in Utah, but in recent decades become more noticeable in residents' daily lives. In Utah, these extremes include significant heat events, drought, and intense rainfall from thunderstorms. Heat and drought have the potential to negatively impact the available supply of water but water districts have collaboratively-phased plans to drastically reduce water consumption if and when those threats to supply occur. A less drastic phase was used in 2022 after two previous years of drought. Generally, Utah water districts have sufficient supply for two years but a third year begins to require the application of one of the agreed upon water reduction plan strategies, called phases, in a progressive manner; if conditions worsen, the restrictions increase.

A key opportunity for cities to guide conservation is through the application of landscaping requirements. This is one of their strongest tools because, across the Wasatch Front, outside water use far exceeds indoor water use, especially for institutional and residential land uses that irrigate relatively larger landscaped areas. The Jordan Valley Water Conservancy District, a regional water provider, found that within their service area, summer residential water use was three times that of winter water use, and institutional summer water use was nearly five times that of winter water use, generally attributed to parks and recreation use. While these numbers are not from the city, the Wasatch Front region follows this general pattern of substantial summer water use. City parks and residential landscaping account for a large portion of water use overall during the summer months and are key opportunity areas for water conservation efforts.

Excessive water events through thunderstorms are dealt with through the city's stormwater system and managing water flows in the river systems. For example, the water level in Pineview Reservoir can be controlled by allowing storage to increase during a major event. The city's system of detention and retention ponds is designed to handle a 100-year storm. While such storms are rare, city needs may be changing as storm intensity and frequency could be increasing.

Water Conservation Best Practices

There are many commonly used best practices to address water needs in Utah communities. These generally involve the following:

- Water Efficient Design Standards:** Communities are requiring water efficient or xeriscape designs in new residential, commercial and industrial required landscape areas. This focus is usually on street-facing landscape areas and may include returning on-site runoff water to those landscaped areas. This concept, generally called “low impact development (LID)” provides additional water to landscape areas and reduces the demand within a stormwater system. LID works for smaller storms but likely cannot handle a 100-year storm event.
- Retrofit:** Incentives to convert existing turf to xeriscape designs are having a significant positive impact in many communities. In addition to reductions in the amount of water being used, an obvious cost savings to the consumer, partial rebates are being offered by many water districts throughout the State. When a design plan is approved, the property owner becomes eligible for a rebate. Ogden, in conjunction with the Weber Basin Water Conservation District, currently operates a “flip your strip” program. This program provides rebates to property owners who convert turf grass park strips to water-wise landscaping.
- Better Meters and “Smart” Controllers:** Metering of water use helps determine if over watering is occurring or if a system leak is happening. Cost savings are considerable since leaks can go undetected for some time where no meter quickly records and alerts you to changes in water usage. Smart controllers help determine soil moisture and to halt sprinkling when rain events provide sufficient water for landscaping. Rebates for such installations are often available and create incentives for conservation.
- Education:** Although the past drought years have likely created an awareness of the excesses in outdoor water use, there is always a need to understand the actual techniques of conserving water. Replacing indoor water fixtures, such as toilets, faucets, and shower heads are simple actions to consider, but habits such as leaving your water on to get warm and while brushing your teeth are harder to change. Education can help us remember that many of these indoor habits and fixtures can be changed.
- Resources:** Education is an important part of a conservation strategy. Most water conservation districts provide local programs that teach about the importance of water conservation. Classes are available to property owners on learn how to



Figure 11. Xeriscape Design (Source: Logan Simpson)

transition from traditional high water use landscaping to more water efficient landscaping. Demonstration gardens, brochures, low water use plant lists, and basic design education programs become incredibly helpful to those contemplating changing their existing landscaping to a more sustainable form.

Goals and Objectives

The following goals and objectives are endorsed with the understanding that water demands are a function of land use policies managed by the City and supply availability managed by the water districts. This creates the need for collaboration between programs and initiatives, since no one entity can accomplish needed conservation by itself.

Goal 1. Reduce outdoor water use.

Objective 1.1 Within the 2025 Unified Development Code update, include updates to the Landscape chapter, providing:

Action 1.1.1. In new commercial and industrial developments, require water efficient designs and limit turf.

Action 1.1.2. Consider retrofit requirements for existing commercial and industrial developments wanting to add on to their building in a substantial manner and/or where site designs will change significantly.

Action 1.1.3. Require park strips to be designed using water-wise principles and encourage water-wise front and side yard landscaping.

Action 1.1.4. Require smart water irrigation systems and access to daily monitoring in all new development.

Action 1.1.5. Prevent daytime watering between the hours of 10 AM to 6 PM.

Action 1.1.6. Promote onsite water retention and use water collected from surface runoff (Low Impact Development) and rain barrels for onsite irrigation.

Goal 2. Reduce indoor water use.

Objective 2.1. Decrease indoor per capita water consumption by 10% per capita by 2050.

Action 2.1.1. Provide educational resources and programs to raise awareness of cost savings to property owners.

Action 2.1.2. Continue to provide rebates for efficient fixtures.

Goal 3. Encourage educational conservation efforts.

Objective 3.1. Provide education programs within the city.

Action 3.1.1. Encourage demonstration gardens on city-owned property, schools, and secondary education establishments.

Action 3.1.2. Provide educational materials within water bills.

Action 3.1.3. Continue to provide educational classes for the do-it-yourself homeowners on how to install water-wise landscaping systems, including planting and irrigation.

Action 3.1.4. Promote secondary water use instead of culinary water use in areas served by secondary water.

Action 3.1.5. Hold annual collaborative meetings with water providers to coordinate projects and address system issues.

Goal 4. Improve operational efficiencies for water providers and large users.

Objective 4.1. Address leakage and aging pipe infrastructure.

Action 4.1.1. Increase the awareness of water system usage changes through pipe system metering.

Action 4.1.2. Repair as soon as possible any system leaks in public and private water systems.

Objective 4.2. Promote conversion of large landscaped areas to more water-efficient landscapes.

Action 4.2.1. Promote transitions to low water use turfs, such as clover, tall fescue, and Tahoma 31.

Action 4.2.2. Promote conversion of non-recreation use areas in parks and open spaces from turf to more water-wise landscapes.