



Great Salt Lake Water Conservation Toolbox

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PREPARED FOR

Great Salt Lake Advisory Council

PREPARED BY

SWCA Environmental Consultants

GREAT SALT LAKE WATER CONSERVATION TOOLBOX

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1 INTRODUCTION

Utah ranks as one of the nation’s driest and fastest growing states and is currently facing significant challenges with a drying Great Salt Lake (GSL). As the largest waterbody in the state, the GSL is a critical ecological and economic resource for Utah. It is the largest saline lake in the country and the eighth largest in the world. It provides habitat for a wide array of local and migratory bird species while also contributing at least \$1.5 billion to the local economy from industrial and recreational activity (AECOM 2019). Beyond its economic and ecological benefits, the lake plays a critical role generating precipitation over the GSL basin. Human development and use of water in the watershed have caused a decline of 11 feet in the GSL since the late nineteenth century, and in response to extreme drought conditions in 2022, the GSL level broke record lows. Without the lake, the surrounding areas would experience an approximate 50% reduction in precipitation (Gu et al. 2024). Declining lake levels have significant implications for GSL ecology, which would affect millions of people living on the Wasatch, as well as the state’s economy.

Water conservation is necessary to increase the delivery of water to the GSL and to accommodate anticipated population growth within the existing developed water supply. To accomplish this goal, there will need to be acceptance and active participation in water conservation efforts among homeowners, industries, municipalities, and agricultural users. Reducing the water consumption of municipal and industrial (M&I) water users is a critical component of these efforts. Measures such as indoor and outdoor water use ordinances, conservation-minded water rate structures, and incentive and rebate programs can shape consumer behavior to be more conservation focused. With the dynamic nature of Utah’s communities and the duty to protect the GSL, water conservation tools will need to be implemented by regulating authorities to protect the integrity of the GSL’s ecosystems and the surrounding communities that rely upon the lake.

The Great Salt Lake Advisory Council, with support from SWCA Environmental Consultants and WSP Consultants, have developed this Water Conservation Toolbox, which is grounded in lessons learned and known constraints facing Utah’s municipalities. The purpose of this toolbox is to provide municipalities and other local governments with the information and insights needed to optimize their water conservation practices.

2 ORDINANCES

2.1 Summary of Water Ordinance Principles

Local ordinances are laws enacted by municipal governments to address specific community needs that may vary from what state or federal statutes entail. These ordinances play a crucial role in the conservation of community resources, such as water. By setting rules and guidelines to protect and manage natural resources effectively, local ordinances can often be the most impactful component of a municipality’s resource management plan. Ordinances aimed at increasing water conservation ensure the long-term availability of water by encouraging behavior change among water users and reducing water waste through efficient technology. These ordinances also prepare cities and municipalities for the impacts of droughts and growing population on water supply and demand. Although ordinances governing the use of water resources can effectively improve conservation outcomes, ordinances are most effective when addressing new developments and redevelopments. Water conservation measures required and recommended by local ordinances are often much easier to adopt for new developments and redevelopments than for existing developments, as the cost of required technologies and the implementation of landscape or property design standards is typically less cost prohibitive and easier to

enforce. Conservation efforts for existing developments are best implemented through the use of rebate and incentive programs; these programs allow for the adoption of water conservation practices and technologies by water users who may not otherwise have the means to incorporate conservation measures on their respective properties (see Chapter 4) (Bee and Forsyth 2024; Parry 2024).

2.2 Outdoor Ordinance

2.2.1 Approach to Developing the Outdoor Ordinance

The state of Utah is among the driest in the United States, receiving approximately 10 inches of precipitation each year across most of the state (Utah Division of Emergency Management 2024). With 50% to 65% of municipal water used in urban landscaping annually and with a population that is expected to double by 2065, managing the use of the state's water resources for landscaping has become a critical component of safeguarding the state's water supplies and natural water features, such as the GSL (Utah Division of Water Resources [UDWR] 2024a; Utah State University Extension 2024).

Development of the model outdoor ordinance (Appendix A) centered around three key components:

1. Reducing outdoor water use
2. Incorporating water-conserving elements and practices in landscape design and replacing grass lawns that are decorative in nature with water-wise landscaping
3. Improving the efficiency requirements for irrigation technology

Establishing best practices and determining the most effective approaches to conservation-focused ordinances involved consulting with several public agencies, utilities, and water conservancy districts from various regions in the state of Utah. These discussions focused on conservation practices and the successes and failures of previously enacted ordinances, which provide the basis for the water conservation measures detailed in the model outdoor ordinance (see Appendix A). In addition, various resources developed by entities such as Utah water conservancy districts, the UDWR, and the U.S. Environmental Protection Agency (EPA) informed the development of the model outdoor ordinance (Table 1).

Table 1. Resources Used to Develop Outdoor Ordinance

Agency/Entity	Description	Link/Reference
EPA	The agency's WaterSense program establishes performance and efficiency standards for fixtures and appliances, including irrigation timers. This information was used to inform technology requirements.	https://www.epa.gov/watersense
UDWR	This dynamic guide to watering grass lawns in Utah is used to guide irrigation scheduling.	https://conservewater.utah.gov/weekly-lawn-watering-guide/
Efficient Water Use in Residential Urban Landscapes	This review summarizes how technology, management practices, community, and ordinances impact water use efficiency.	https://doi.org/10.21273/HORTSCI.43.7.2081
Alliance for Water Efficiency	The Alliance for Water Efficiency produces research, tools, resources, and other information needed for advancing water conservation.	www.allianceforwaterefficiency.org/
Jordan Valley Water Conservancy District (JVWCD)	The JVWCD's water efficiency standards provided a guide for the establishment of water efficiency standards in the model outdoor ordinance. These standards were used to develop the "moderate conservation" standards (Table 2).	https://jvwcd.org/public/wes
Utah Water Savers	Utah Water Savers provides information regarding incentives and rebates for water conservation and water efficiency practices. This information was used to address meeting conservation goals in existing developments.	https://www.utahwatersavers.com/
Slow the Flow	Slow the Flow provides information about water conservation actions and practices and offers tools and other resources. The information provided was used to guide decisions relating to irrigation scheduling, landscape design, and technology requirements.	https://slowtheflow.org/
Weber Basin Conservancy District	A model landscape ordinance provided by Weber Basin Conservancy District informed the structure of ordinances typically adopted in the GSL Basin and informed decisions relating to conservation practices.	(Weber Basin Conservancy District 2021)
Utah Code 10-9-403(2)(iv)	This rule stipulates that municipalities are responsible for regulating the consumptive use of water.	https://le.utah.gov/xcode/code.html
Utah Code 10-3-702	This rule authorizes municipalities to adopt and enforce ordinances.	https://le.utah.gov/xcode/code.html
Utah Code 59-2-503	This rule establishes the definitions for agricultural land.	https://le.utah.gov/xcode/code.html
Utah Codes 11-39-108, 53G-7-224, and 72-7-111	This rule limits the installation, maintenance, and use of spray irrigation on public property.	https://le.utah.gov/xcode/code.html

2.2.2 Outdoor Ordinance Options and Considerations

Each of Utah's communities is unique in its needs, necessitating ordinances that are customizable to meet each community's conservation goals. The model outdoor ordinance was developed to include recommended and required actions that aim to meet conservation needs based on individual community requirements (see Appendix A).

Municipalities can tailor the model outdoor ordinance to meet their specific goals within three tiers of conservation—low, moderate, and high—each offering a variety of options that can be selected based on the desired level of water savings and community objectives (see Table 2). This tiered system ensures that measures that are effective and suitable for the unique circumstances of each city can be implemented, and the system provides a comprehensive overview of the available options within each tier. The low conservation tier focuses on simple measures, such as limiting lawn-watering times, whereas the high conservation tier requires the implementation of advanced technologies, such as smart irrigation controllers and the mandatory use of drought-resistant plants. Each conservation tier uses limitations to the proportion of allowable grass lawns to total landscaped area, addressing a growing area of concern in urban and suburban water resource management. These limitations reduce the demand on water resources and allow for the use of more efficient irrigation systems to irrigate landscaping. These recommendations and requirements address water conservation across a wide range of property types, including residential, commercial, and public entity properties. The irrigation schedules and design standards remain relatively standardized across development types; however, changes to the allowable proportion of grass lawns and irrigation technology requirements for commercial and public entity developments were incorporated with the goal of further improving conservation outcomes.

The measures detailed in the model outdoor ordinance are broadly applicable to most property types within a jurisdiction, though there are likely to be some variances to the requirements for commercial and institutional properties. These include changes to the allowable area for grass lawns on newly developed or redeveloped landscaped areas and technology requirements for irrigation systems. These differences were necessary to address the water quantities and scale of different types of properties and to address common differences in site conditions between residential properties and commercial properties. Some elements of the model outdoor ordinance are specific to new development and redevelopment; however, it is recommended that municipalities determine a date by which existing developments must adopt landscaping requirements and install and use technologies that align with the standards detailed in the ordinance.

The model outdoor ordinance includes moderate conservation requirements, which were developed based on elements of the Jordan Valley Water Conservancy District's (JVWCD's) water efficiency standards and the eligibility requirements for the Utah Division of Water Resource's incentives and rebate program (see Chapter 4 for more details on this program). The moderate conservation requirements include options such as efficient irrigation practices and scheduling, the use of water-conserving plants, and design standards for landscaping that minimize water waste. All conservation ordinance tiers require the installation of water meters for secondary water for all development types.

The conservation tiers outlined in Table 2 for the outdoor ordinance were designed to provide options for municipalities to begin water conservation practices easily. However, eventually, all municipalities will need to strive to adopt the highest tier of conservation for the GSL Basin to live within existing water supplies and to maintain flows to the GSL. Utah will not be able to grow and live within existing water supplies if municipalities and cities adopt and only maintain the low conservation tier.

Table 2. Outdoor Ordinance Options Based on Conservation Goals

Ordinance Approach	Low Water Conservation Standards	Moderate Water Conservation Standards	High Water Conservation Standards	Applicable to
Landscape Design and Materials (Section 4)				
Grass Lawns Restriction	Grass lawns shall account for no more than 50% of front and side yards of landscaped areas.	Grass lawns shall account for no more than 35% of the front and side yards of landscaped areas.	Grass lawns shall account for no more than 20% of total landscaped areas.	<ul style="list-style-type: none"> • New development • Redevelopment • Residential • Multi- Family Residential • Industrial • Commercial • Public Entity
	No restrictions.	Grass lawns shall not be planted in areas narrower than 8 feet wide.	See Moderate Water Conservation Standards.	
	No restrictions	The 35% grass allowance is capped at large lots that are greater than 1,500 square feet, 0% is allowed for the remainder of the lot.	The 20% grass allowance is capped at large lots that are greater than 1,500 square feet, 0% is allowed for the remainder of the lot.	
Plant Selection	No restrictions.	No restrictions.	A minimum of 50% of the vegetation shall be drought-tolerant species well suited to micro-climates.	
	No restrictions	Plants selected for planting beds shall be planted with water-conserving plants. Planting beds shall not be planted with groundcover species or a mass of vegetation requiring overhead spray irrigation.	See Moderate Water Conservation Standards.	
Mulch	No restrictions.	Non-vegetated areas within landscaped areas shall be covered with mulch 3 inches deep.	Moderate Water Conservation Standards + No plastic sheeting or groundcover that is impervious to air or water is allowed.	
Vegetation Coverage	No restrictions.	Recommended: Landscaped areas should have 50% plant coverage at plant maturity, not including tree canopy.	Landscaped areas must have 50% plant coverage at plant maturity, not including tree canopy.	
Soil tilling	No restrictions	No restrictions	To ensure healthy soil conditions and infiltration, soil preparation should include scarifying the soil to a depth of at least 6 inches before vegetation planting occurs.	
Vegetation Placement	No restrictions.	No restrictions.	Plants planted in “landscape zones” shall have similar water needs.	

Ordinance Approach	Low Water Conservation Standards	Moderate Water Conservation Standards	High Water Conservation Standards	Applicable to
Landscape Irrigation Schedule (Section 5)				
Time of Day	Irrigation NOT allowed between 10 a.m. and 6 p.m.	Irrigation NOT allowed between 8 a.m. and 8 p.m.	See Moderate Water Conservation Standards column.	<ul style="list-style-type: none"> • New development • Redevelopment • Residential • Multi-Family Residential • Industrial • Commercial • Public Entity
Weekly Schedule	Irrigation allowed 3 days a week during a declared water shortage.	Irrigation allowed: 2 days a week in July and August or in case of declared water shortage. An additional third (3 rd) day of each week between June 1 and October 31 when temperatures exceed 90 degrees Fahrenheit for a period of more than 4 hours in a single daylight cycle	Irrigation allowed 2 days a week from May through September; watering days are determined by address.	
New Landscaping – Applicable timeframe for irrigation requirements	Within 90 days of planting, new landscaping may be irrigated.	Within 45 days of planting new landscaping may be irrigated	See Moderate Water Conservation Standards column.	
New Landscaping – Irrigation Frequency	No restrictions.	New landscaping may be irrigated: on the day it is installed without regard to the listed watering days and times and three times a week during 45-day establishment period. Soil may be pre-irrigated prior to planting without regard to the listed watering days and times.	See Moderate Water Conservation Standards column.	
New Landscaping – Irrigation Area	No restrictions.	Irrigation of new landscaping: must use spray or drip and is limited to areas containing only new landscaping. If <50% of zone, only individual new plantings are eligible for additional irrigation	See Moderate Water Conservation Standards column.	
Water Shortage	Any water shortage, restrictions, or other declared or related orders that are more restrictive will supersede ordinance	See Low Water Conservation Standards.	See Low Water Conservation Standards column.	

Ordinance Approach	Low Water Conservation Standards	Moderate Water Conservation Standards	High Water Conservation Standards	Applicable to
Irrigation Technology and Design Requirements (Section 6)				
Irrigation Controllers	No restrictions.	Irrigation systems shall be equipped with an irrigation controller that can be programed to irrigate based on time of day.	Irrigation systems shall be equipped with a smart irrigation controller that can be programed to irrigate based on local weather patterns or soil moisture.	<ul style="list-style-type: none"> • New development • Redevelopment • Residential • Multi-Family Residential
Drip Irrigation	No restrictions.	<p>Drip irrigation shall be used to irrigate non-grass vegetation in the landscaped area.</p> <p>Drip emitters shall</p> <ul style="list-style-type: none"> • be point source or in-line type, • not exceed 5 gallons per hour, and • be fitted with a pressure regulator filter and a flush end assembly. 	<p>Moderate Water Conservation Standards</p> <p>+</p> <p>Each irrigation valve shall irrigate an area with similar soil conditions and water needs.</p>	<ul style="list-style-type: none"> • Industrial • Commercial • Public Entity
Spray Irrigation	No restrictions.	Irrigation systems in grass landscaped areas shall feature rotary type nozzles, except where doing so may lead to water waste.	<p>Moderate Water Conservation Standards</p> <p>+</p> <p>Spray system sprinkler heads must be at least 4 inches tall or tall enough to clear nearby grass or other obstacles.</p>	
	No restrictions.	Any grass that grows to the extent that it blocks or inhibits a spray head sprinkler's distribution of water shall be cut down to the longest length that allows for the successful operation of spray irrigation without impediment.	See Moderate Water Conservation Standards column.	

Ordinance Approach	Low Water Conservation Standards	Moderate Water Conservation Standards	High Water Conservation Standards	Applicable to
Secondary Water (Section 6(4))				
Technology Requirements	All secondary water connections must feature a water meter. Meter type is to be determined by each municipality.	Low Water Conservation Standards + Irrigation systems using secondary water must be fitted with a filter. Filters must be a minimum 30-mesh screen. Filters should be cleaned and maintained according to manufacturer recommendations.	See Moderate Water Conservation Standards column.	<ul style="list-style-type: none"> • New development • Redevelopment • Residential • Multi-Family Residential • Industrial • Commercial • Public Entity
Additional Requirements and Restrictions for Commercial, Industrial, and Multi-family Residential Properties (Section 7)				
Grass Lawn Restriction	Grass lawns shall account for no more than 30% of total landscaped areas, not including active recreation zones.	Grass lawns shall account for no more than 20% of total landscaped areas, not including active recreation zones.	Grass lawns shall account for no more than 0% of total landscaped areas, not including active recreation zones.	<ul style="list-style-type: none"> • Multi-Family Residential • Industrial • Commercial
Additional Requirements and Restrictions for Public Entity Properties (Section 8)				
Landscape Material/Plants	No restrictions.	Local entities within the GSL Basin starting construction on their properties after May 1, 2024, may not install, maintain, or use spray irrigation in a landscaped area of the properties outside active recreation areas and may not treat the properties as active recreation zones if the area is larger than reasonably required for the anticipated use.	See Moderate Water Conservation Standards column.	<ul style="list-style-type: none"> • New development • Redevelopment • Public Entity
Grass Lawns Restrictions	No more than 30% of a landscaped area may be grass, not including active recreation areas.	No more than 20% of a landscaped area may be grass, not including active recreation areas.	0% of a landscaped areas may be grass, not including active recreation areas.	

Ordinance Approach	Low Water Conservation Standards	Moderate Water Conservation Standards	High Water Conservation Standards	Applicable to
Additional Requirements for Homeowners Association Developments (Section 9)				
Restrictions on Authority	No restrictions.	Homeowner association governing documents are void if they <ul style="list-style-type: none"> require uniform non-grass plants that require spray irrigation; require spray irrigation in areas narrower than 8 feet; prohibit the use of water-conserving, drought-resistant plants; and have the effect of prohibiting or contradicting any measure of this or other water-conserving ordinance. 	See Moderate Water Conservation Standards column.	<ul style="list-style-type: none"> New development Redevelopment Residential Multi-Family Residential
Existing Development*				
Enforcement	Recommended: Municipalities determine a date by which existing developments must adopt landscaping requirements and install and use irrigation technologies that align with the standards detailed in the ordinance.	See Low Water Conservation Standards column.	See Low Water Conservation Standards column.	<ul style="list-style-type: none"> Existing Development Residential Multi-Family Residential Industrial Commercial Public Entity

Notes: Moderate and High Water Conservation Standards categories include the conservation measures detailed in subsequent sections, unless otherwise stated. For example, the (Low+) Moderate Water Conservation Standards category will include the stipulations outlined in both the Low Water Conservation Standards column and the Moderate Water Conservation Standards column.

The section numbers listed in the Ordinance Approach column refer to the Appendix A sections where these measures can be found.

* Existing Development restrictions are not currently in the model outdoor ordinance (see Appendix A); however it is encouraged that municipalities add this to their ordinance to accelerate water conservation.

2.3 Indoor Ordinance

2.3.1 Approach to Developing the Indoor Ordinance

Although most the state’s culinary water resources are used for irrigating urban landscaping, improving the efficiency of water used indoors, in homes, businesses, and other properties is a critical component of any water conservation plan. The development of the model indoor ordinance is centered around the adoption of efficient in-home plumbing fixtures aimed at reducing consumptive water use while maintaining fixture performance (Appendix B). Improving the adoption of efficient water fixtures that meet the strictest recommended standards could reduce fixture water use/consumption by approximately 20% (EPA 2024). Resources developed by entities such as the JWCD and EPA informed the development of the model indoor ordinance (see Table 3).

Table 3. Resources Used to Develop Indoor Ordinance

Agency/Entity/Title	Description	Link/Reference
Utah State Code 15A	Amendments to the state plumbing code establish statewide standards.	https://le.utah.gov/xcode/Title15a/15a.html
JWCD	The JWCD’s water efficiency standards provided a guide for the establishment of water efficiency standards in this ordinance.	https://jwcd.org/public/wes
EPA	The agency’s WaterSense program establishes performance and efficiency standards for fixtures and appliances, including irrigation timers. This information was used to inform technology requirements.	https://www.epa.gov/watersense
Measuring Urban Water Conservation Policies: Toward a Comprehensive Index	This source provides a review of water conservation policies in the United States.	https://onlinelibrary.wiley.com/doi/10.1111/1752-1688.12506
Alliance for Water Efficiency	The Alliance for Water Efficiency produces research, tools, resources, and other information needed for advancing water conservation.	www.allianceforwaterefficiency.org/
Utah Code 10-9-403(2)(iv)	This rule stipulates that municipalities are responsible for regulating the consumptive use of water.	https://le.utah.gov/xcode/code.html
Utah Code 10-3-702	This rule authorizes municipalities to adopt and enforce ordinances.	https://le.utah.gov/xcode/code.html

2.3.2 Indoor Ordinance Options and Considerations

The model indoor ordinance incorporates standards required under Utah’s plumbing code and amendments to the plumbing code in Utah Code 15A-1-204(8) for indoor plumbing fixtures to ensure efficient water use and the security of water resources. These standards currently align with the EPA’s WaterSense program except for the toilet standard, which is 0.3 gallons per flush higher in the Utah plumbing code (Table 4). Currently, municipalities in Utah are not permitted to enforce water efficiency standards that are more stringent than those set by the state of Utah, preventing local variations that could otherwise achieve higher levels of conservation.

To increase efficiency and promote conservation, it is recommended that municipalities encourage the adoption of standards set by the EPA WaterSense program or higher standards, such as those used in California (see Table 4). Offering a range of high-efficiency and high-performance plumbing products that exceed standard water usage requirements while promoting high performance, WaterSense-labeled

toilets, showerheads, faucets, and other products are certified to use at least 20% less water than standard models without compromising performance (EPA 2024). According to the JWCD, Utah's could save approximately 16,000 acre-feet of water (4.5 billion gallons) per year starting in 2030 with an accelerated adoption of WaterSense products and standards (Iwamoto and Forsyth 2022).

Maximizing the adoption of these high-efficiency products requires the implementation of rebate and incentive programs, which significantly lower the initial cost barrier for consumers, encouraging them to replace older, less-efficient fixtures. Utah could approach nearly 100% adoption of WaterSense-labeled products by 2050 regardless of development type, assuming sink faucets and shower heads are replaced every 12 to 15 years on average and toilets are replaced every 30 years (Iwamoto and Forsyth 2022). Although the model indoor ordinance was developed with the intent of improving water efficiency in new developments and redeveloped properties, it is recommended that municipalities determine a date by which existing developments must install and use fixtures that meet the standards detailed in the ordinance.

Table 4. State of Utah Plumbing Fixture Standards vs. WaterSense Standards

Fixture Type	Utah State Standard	WaterSense Standard	California State Standards
Lavatory, private	1.50 gallons per minute (gpm) at 60 pounds per square inch (psi)*	1.5 gpm [†]	1.2 gpm at 60 psi
Lavatory, public (metering)	0.25 gallon per metering cycle	No standard [†]	0.5 gpm at 60 psi
Lavatory, public (non-metering)	0.50 gpm at 60 psi	No standard [†]	No standard
Shower head	2.00 gpm at 80 psi*	2 gpm	1.8 gpm at 80 psi
Sink faucet	2.20 gpm at 60 psi	No standard [†]	1.8 gpm at 80 psi
Urinal	0.5 gallon per flush cycle*	0.5 gallon per flush cycle	0.5 gallon per flush 0.125 gallon per flush (wall mounted)
Toilets (tank or Flushometer)	1.6 gallons per flush cycle	1.28 gallons per flush cycle	1.280 gallon per flush

Sources: California State Plumbing Code; EPA (2024); Utah State Plumbing Code.

* Meets or exceeds EPA WaterSense standards.

[†] Efficiency standard in development or under revision.

2.4 Best Practices for Adoption and Enforcement of Ordinances

The most effective methods for promoting conservation through the adoption and enforcement of ordinances will differ based on each municipality's unique needs. However, best practices for promotion are essential components of a successful rollout of ordinances and should be employed whenever feasible.

First, developing an understanding of which tools are most effective in increasing conservation depending on different urban contexts is critical to a tailored approach. Developed cities with robust infrastructure and development will often experience the most success in implementing incentive or rebate programs to drive changes in community behavior, as it can be challenging to implement sweeping changes in such environments through ordinances alone. Conversely, developing and growing communities have the advantage of being able to integrate water conservation measures into their community-wide plans and local ordinances, allowing those communities to mandate efficiency rather than incentivize it.

When developing, planning, and implementing new conservation ordinances, engaging internal stakeholders is a critical component of understanding the needs and goals for growth of the community. Stakeholders can range from public works departments to utility managers to citizen led action groups. Early involvement of these stakeholders ensures that the proposed regulations are feasible and aligned with the community's overall goals. This collaborative effort aids in fostering a sense of ownership of and accountability for the success of the conservation measures among community members.

Public engagement is not limited to stakeholder groups; however, focus groups can serve as a powerful tool in engaging the public, fostering support for a proposed ordinance, and developing a deeper understanding of community needs. Providing a platform for members of the public and stakeholder groups to voice opinions and concerns facilitates the refinement of ordinances to meet the needs of the public and garner support.

Lastly, outreach and education are key to a seamless adoption of and compliance with water conservation ordinances. Developing comprehensive educational materials that explain new regulations and the rationale behind them helps not only educate community members but also fosters support. It is important to engage community members through clear messaging to remove any barriers to communication and ensure a productive two-way dialogue.

3 WATER RATE STRUCTURES

3.1 Background Information

3.1.1 *Principles Underlying Water Rate Structures as a Conservation Tool*

Water users in urban and suburban settings pay to have water captured, treated, and conveyed to their homes or businesses. This section makes a distinction between primary (culinary) and secondary water. Primary water is potable water treated to meet drinking water standards and used for household and commercial purposes. In contrast, secondary water is non-potable, typically untreated, and used mainly for irrigation and other non-drinking purposes.

For the purpose of this report, three broad methods of payment are considered. First, government revenue (often property tax revenue) may be used to fund capital expenditures or, in some cases, to cover the cost of day-to-day operations and maintenance. Second, fees unrelated to the amount of water consumed (that is, flat fees) may be levied on individual water users. Utah's secondary water system has historically followed a flat fee system. Finally, fees that are directly linked to the amount of water consumed may be levied on individual water users (water rates).

Water rates and water rate structures establish the linkage between the amount of water that flows to a customer and the amount of money that a customer pays for water.

When policymakers think about water rate structures as a general matter, they are often guided by conflicting motivations:

1. Because reliable water is a cornerstone of most urban and suburban areas, there is a desire to ensure that the money paid to water providers is sufficiently large and predictable to support the development and maintenance of appropriate water delivery systems. This motivation may encourage, at least in part, the funding of water provision with tax revenue.

2. Equity-based arguments may motivate some policymakers to work toward ensuring that water is priced such that all residents can afford to meet their basic needs. This may encourage the adoption of tiered water rate structures in which a volume of water sufficient to meet basic needs, such as drinking, cooking, and cleaning, is delivered to a meter at a low cost. Then, as the volume of water delivered to a customer increases, the per-unit cost of the water increases.
3. Development goals have led some localities to adopt pricing strategies for commercial/industrial users that differ from the pricing strategies applied to residential customers. Commercial or industrial pricing strategies are often intended to attract large commercial enterprises or industry to an area in order to stimulate the economy. Alternatively, in some water-stressed areas, water pricing is used to discourage water-intensive industries in a community. For example, Arizona's water management policies include higher water rates and usage fees targeting water-intensive industries, effectively incentivizing these industries to either adopt more efficient water use practices or relocate to areas with more abundant water supplies (Megdal 2012; Zhang et al. 2022).
4. In contrast, when policymakers think about the use of water rate structures as a water conservation tool, the guiding principle is clear: as the price of a product increases, individuals tend to consume less of the product. Thus, if the goal of a water rate structure is to encourage water conservation, water customers who choose to reduce their water usage must face lower prices than they would if they chose not to reduce their water usage.

The most common approach to incentivizing water conservation through water rates is the increasing block rate structure. In this structure, the per-unit price for water increases as the volume consumed increases. Customers who use modest volumes of water are charged a modest per-unit price and are thus rewarded for conservation, whereas those using significantly higher volumes pay higher per-unit prices (Western Resource Advocates 2005). For a detailed exploration of how this pricing framework can be adapted to address the needs of different city types, user categories, and sectors, refer to Section 3.2.

- Increasing block rate structures can be uniform (all customers face the same block rates) or individualized. Individualized block rate structures are customized to fit a customer's circumstances. For example, an individualized block rate structure for residential customers might consider the number of residents or lot size when establishing prices. Although the information burden may be high for individualized block rate structures, their implementation increases economic efficiency.
- Where seasonal factors make conservation more critical at certain times of year, seasonally adjusted water rates (that is, rates that increase in seasons when water is costly) may also be used. Western Resource Advocates (2005) report that Salt Lake City and Park City use (or at least used at the time) a seasonal rate structure and an increasing block rate structure in combination. By using increasing block rates only during the irrigation season, the combined structure considers the changing cost of water throughout the year while still providing a price signal within the irrigation season.

3.1.2 Role of Water Rate Structures in a Comprehensive Water Conservation Plan

Utah Foundation (2019) notes that the state of Utah is somewhat unusual in that property taxes, fees, and water rates are often used simultaneously to fund water delivery. Indeed, they report that 90% of Utahns

live within the jurisdiction of a water provider that collects at least some portion of its revenue through property taxes. This mixed funding approach offers several advantages while posing several challenges:

- On the upside, including property taxes and flat fees to pay for water delivery broadens the funding base (that is, costs are shared among a larger pool of people) and so reduces the average cost per person; taxes can be targeted to promote fairness/equity and they increase the predictability of future revenue streams. This predictability simplifies planning and may reduce the cost of borrowing for large capital projects.
- On the downside, by decoupling (partially or totally) a customer's decision to consume more or less water from the amount of money they pay for water, a water delivery funding system that includes taxes and flat fees reduces an individual's incentive to conserve water to reduce expenses. A tax and flat fee-based system also tends to reduce incentives for the water delivery entity to work efficiently and may be viewed as less transparent than a water rate-based system.¹ However, even with varied application of property taxes, introducing conservation-oriented rate structures can still be a practical way to positively impact water use behavior. Additionally, they can also help maintain affordability for users and financial stability for providers.

The intent of this analysis is not to advocate for the broader adoption or abandonment of any of the individual payment approaches. Rather, it is observed that two conditions must be met for water rate structures to effectively serve as tools for water conservation:

1. The entity responsible for water billing must have a way to monitor the amount of water used by individual customers and adjust bills accordingly. Thus, water rate structures are likely to work better in a setting where each individual dwelling or business has its own water meter; they are likely to be less effective when a single meter is used to measure water usage for an entire apartment building, office complex, or homeowners association.²
2. The amount of money a customer can save by reducing their water consumption must be large enough to induce a change in behavior. Although the definition of "large enough savings" will vary from customer to customer, a meta-analysis of available studies indicated that a 10% increase in the price of water is likely to bring about an approximately 5% reduction in water use (Gardner and Simmons 2012). Two important caveats of the "large enough" concept are as follows:
 - a. Utah Foundation (2019) notes that, because water providers are generally not allowed to produce profits, water providers must be able to justify water rate structures to prevent legal challenges. This may discourage water providers from imposing steeply tiered rate structures and/or rates high enough to achieve desired conservation goals.
 - b. A utility's marginal costs (that is, the costs of meeting an increase in water demand) may be equated to a justifiable price. If those marginal costs are not high enough to induce a behavioral change, it may be possible to develop water rate structures that are "high enough" to accomplish a conservation goal even if prices exceed marginal costs, so long as surplus revenue earned by the water distributor is invested back into technologies and/or rebates that further support water conservation goals. This concept is known as the "double dividend approach."³

¹ See Utah Foundation (2019) for an expanded discussion of the pros and cons associated with alternative water funding structures.

² The recently passed Utah Code 73-10-34 requires that all secondary pressurized connections be metered by January 1, 2030. It is proposed that pressurized secondary water systems be required to install meters to track water usage by 2030. In addition, Utah Code 73-10-34.5 appropriated \$250 million for the purchase and installation of secondary water meters. The Alliance for Water Efficiency (2024) reports that unmetered water consumption is reduced 15% to 30% when metering and commodity rates are implemented.

³ For more information see Tax Foundation (2024).

It is important to recognize that there are many ways to encourage water conservation, because the preceding conditions may not always hold. Some localities offer on-site inspections to help customers reduce water waste; these are sometimes accompanied by free or discounted conservation equipment. Additionally, some localities may create ordinances that require or ban the use of specific technologies, whereas others may find success through public education and appeals to conserve water.⁴

Given this, water rates can be an important part of an overall water conservation strategy. Utah state law requires retail water providers to adopt increasing tiered pricing for culinary water.⁵ Additionally, rate structures designed to encourage the more efficient use of water are allowed to be included in water providers' water conservation plans.⁶ Moreover, because rate-based water conservation approaches afford water users the ability to choose if and how they respond to an increase in price, reliance on water rate structures to accomplish water conservation goals is often thought to represent a socially efficient means of conservation.

3.1.3 Existing Pricing Rate Structures Potentially Relevant in Utah

More than 300 water providers operate in Utah. In 2004, Western Resource Advocates reviewed the rate structures of 12 municipal water utilities in Utah. Their findings were reported in Western Resource Advocates (2005) and are summarized below. Although this study is nearly two decades old, its conclusions remain applicable. Subsequent research, including studies by Whittington and Nauges (2020), as well as earlier works by Dahan and Nisan (2007) and Olmstead et al. (2007), have validated these findings, confirming their ongoing relevance across different settings.

- Although the basic economic expectation is that increasing costs will reduce consumption, Western Resource Advocates did not evaluate the relationship between the price of water and water consumption levels in Utah.
- Eight of the 12 water providers in the 2004 sample applied some form of an increasing block rate structure; in previous years, uniform rate structures were more common.
- Most of the increasing block rate structures were characterized as likely ineffective from a water conservation perspective. This was because the blocks were too large (that is, consumers faced the same price over a broad range of water consumption), and/or the rate of the price increase was too small, and/or a substantial portion of revenue came from property taxes and/or fixed fees, and so the overall average prices were too low.

Utah Foundation's (2019) report, *Paying for Water*, used data collected by the Utah Governor's Office of Management and Budget to update and expand the existing study of water rate structures. A review of 107 retail water providers revealed the following:

- There is a strong relationship between the water rate structure and the residential potable gallons used per day per capita. Among retail providers, a 10% increase in the water rate correlated with a reduction of 2.9% in gallons used per capita per day. Similarly, if a water provider had a base rate (a rate all customers pay regardless of water usage) 10% higher than a similar provider, then its water use would be expected to be 3.5% lower. Finally, Utah Foundation found that a 10% increase in both base and tiered rates is linked to a 6.5% lower usage, and this combined effect was similar to previously generated estimates for Utah and other western states.

⁴ The UDWR's Water Resources Plan (2021) sets goals of increasing water conservation by engaging and educating the public, promoting tiered water rates, and working with water providers and suppliers to ensure water conservation plans meet regulatory requirements and includes regional water conservation goals.

⁵ Utah Code 73-10-32.5.

⁶ Utah Code 73-10-32.

- Although increasing block rate structures are common among water providers,⁷ more than 90% of Utahns likely pay lower water rates than they otherwise would, because they live within the jurisdiction of a water provider that relies on property taxes. The broad use of property taxes to fund water delivery reduces the effectiveness of water rates as a conservation tool as a general matter.
- Although the majority of retail water providers apply some form of increasing block rate structure, some providers use flat or decreasing water rate schedules. Because flat and decreasing water rate schedules provide either no, or perverse, water conservation incentives, the potential to encourage water conservation by modifying water rate structures in these specific localities is likely significant.

The diversity in water rate structures among Utah municipalities today highlights the evolution and application of various pricing strategies to address local water management challenges. Table 5 and Figure 1 detail the wide-ranging approaches of current rate structures, as follows:

1. The base rates across different municipalities vary significantly, both in the cost per unit and the volume of water included. Some set low base rates that cover minimal water use, such as a first tier in a tiered price structure, and others charge a flat fee for a fixed volume.
2. Increasing block rates are widely used, but the progression of prices differs greatly. Some communities opt for gradual price increases between tiers, and others implement more aggressive price jumps as tiers progress.
3. Similarly, the number of blocks and their sizes within increasing block rate structures also demonstrate considerable variation among Utah municipalities. Although some areas implement a large number of smaller blocks, others use fewer blocks with larger thresholds.
4. There are notable differences between residential and commercial pricing structures. Generally, commercial rates are higher, and commercial users typically face more aggressive rate increases at higher tiers. Similar to residential pricing, there is significant variability in base rates and tier thresholds among municipalities.

In summary, Figure 1 and Table 5 reveal that, even when tiered rate schedules are adopted by Utah water providers, the form those rate schedules take, as well as the marginal prices being paid, are highly variable. This variability may reflect differences in local socioeconomic conditions, attitudes, water scarcity, and/or costs of infrastructure. For the purpose of this report, the variability in existing rate structures means that the potential to meaningfully modify water consumption by adjusting water rate structures is highly likely to vary across water providers.

⁷ Edwards and Sutherland (2019) report that a 2013 survey of municipal water suppliers in Utah found that 7% use a flat rate, 26% use a uniform rate, 45% use an increasing block rate, 2% use a decreasing block rate, and the remaining 21% do not report their rate structures.

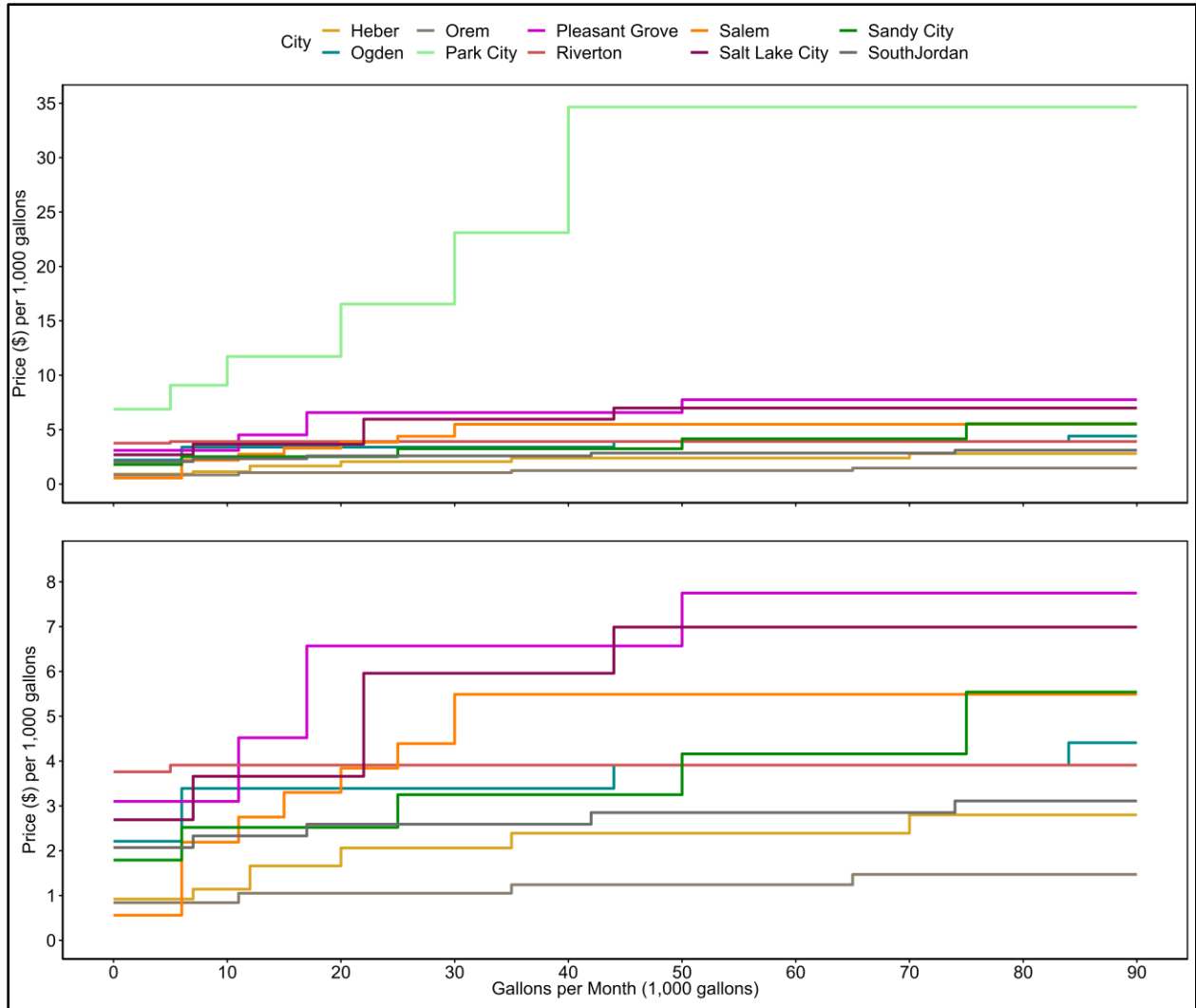


Figure 1. Tiered water rates for select water providers (Residential Properties). Note: Top panel includes Park City tiered rates, lower panel excludes for resolution of the other cities.

Table 5. Tiered Water Rates for Select Water Providers

Municipality	Median Adjusted Gross Income *	Overview	Base Rate	Rate Increase (based on water usage) (price per thousand gallons)	
				Gallons	Price
Heber†	\$58,400	2021 residential and commercial rates	Residential \$25.92	0–7,000	\$0.92
				7,001–12,000	\$1.14
				12,001–19,000	\$1.66
				19,001–35,000	\$2.06
				35,001–70,000	\$2.39
				70,001–999,999,999	\$2.80
			Commercial \$25.92–\$2,327.52	0–7,000	\$1.03
				7,001–999,99,999	\$2.17
Ogden‡	\$42,500	2023 summer residential and commercial rates	Residential \$25.84–\$42.75	0–6,000	\$2.21
				6,001–42,000	\$3.39
				42,001–84,000	\$3.91
				Over 84,000	\$4.41
			Commercial \$59.67–1,371.82	0 and above	\$3.39
Park City§	\$84,500	2023 residential and commercial rates	Residential \$71.60–\$4,820.72	0–5,000	\$6.88
				5,0001–10,000	\$9.08
				10,001–20,000	\$11.73
				20,001–30,000	\$16.54
				30,001–40,000	\$23.10
				Over 40,000	\$34.65
			Commercial (¾-inch meter) \$85.92–\$5,784.86	0–5,000	\$6.88
				5,001–10,000	\$9.08
				10,0001–20,000	\$11.73
				20,001–30,000	\$16.54
				30,001–40,000	\$23.10
Over 40,000	\$34.65				

Municipality	Median Adjusted Gross Income *	Overview	Base Rate	Rate Increase (based on water usage) (price per thousand gallons)	
				Gallons	Price
Pleasant Grove [†]	\$51,400	2023 city fee schedule	\$25.54 (includes 5,000 gallons)	5,001–10,000	\$3.10
				10,001–15,000	\$4.52
				15,001–50,000	\$6.57
				Over 50,001	\$7.75
			Commercial \$25.54 (includes 5,000 gallons)	5,001–10,000	\$3.10
				10,001–15,000	\$3.36
				15,001–50,000	\$3.62
				50,001–100,000	\$3.87
			Over 100,001	\$4.20	
Orem [#]	\$41,300	2016 water rates	No base fee	0–11,000	\$0.84
				11,001–34,000	\$1.05
				34,001–65,000	\$1.24
				Over 65,000	\$1.47
Riverton ^{**}	\$67,100	2024 city fee culinary water rates	\$3.50 per meter	0–5,000	\$3.76
				Over 5,000	\$3.91
Salem ^{††}	\$69,000	2024 city fee schedule	\$23.06	0–5,000	\$0.56
				5,001–10,000	\$2.19
				10,001–15,000	\$2.75
				15,001–20,000	\$3.30
				20,001–25,000	\$3.84
				25,001–30,000	\$4.39
Salt Lake City ^{††} ^{§§}	\$46,500	2023 water rate schedule	Residential \$13.61–\$1,198.50 Dependent on meter size and location	0–7,000	\$2.69
				7,001–22,000	\$3.66
				22,001–45,000	\$5.96
				Over 45,000	\$6.99
			Commercial \$13.61–\$1,198.50	0–7,000	\$2.18
				7,001–22,000	\$3.00
				22,001–45,000	\$4.83
				Over 45,000	\$5.60

Municipality	Median Adjusted Gross Income *	Overview	Base Rate	Rate Increase (based on water usage) (price per thousand gallons)	
				Gallons	Price
Sandy City ^{¶¶}	\$59,800	2024 water rates	\$28.15–\$856.89 (varies by meter size)	0–6,000	\$1.79
				6,001–25,000	\$2.52
				25,001–50,000	\$3.25
				50,001–75,000	\$4.16
				Over 75,000	\$5.54
South Jordan ^{##}	\$75,100	2024 retail water rates	\$3–\$78 (varies by meter size)	0–6,000	\$2.07
				6,001–17,000	\$2.33
				17,001–42,000	\$2.59
				42,001–74,000	\$2.85
				Over 74,001	\$3.11

Note: Unless otherwise stated, all listed rates, base fees, and volume tiers are based on pricing for a ¾-inch water meter.

* Median adjusted gross income for municipality (Utah Department of Environmental Quality 2021).

† Heber City (2023).

‡ Ogden (2023).

§ Park City (2023).

¶ Pleasant Grove (2023).

Orem (2024).

** Riverton (2024).

†† Salem City (2024).

‡‡ Salt Lake City rates were converted from units (1 unit = 748 gallons) to an approximate price per 1,000 gallons (conversion factor = 1.33689).

§§ Salt Lake City Public Utilities (2023).

¶¶ Sandy City (2024).

South Jordan City (2023).

3.1.4 Implementing Conservation-oriented Water Rate Structures in Utah

Designing effective water rate structures for conservation requires a nuanced understanding of local conditions. Socioeconomic factors, infrastructure capabilities, and community-specific behaviors all play critical roles in determining the success of these strategies. Supported by the latest research and the best practices in water policy, the strategic questions listed below can help to assess whether conservation-oriented water rate structures are suitable and effective for a given community.

1. Can the community's existing infrastructure support the accurate measurement and billing of individual water consumption, and are there plans for necessary upgrades if not? Accurate measurement and billing are crucial for the effectiveness of conservation-oriented rate structures. Without the ability to accurately track water consumption, it becomes challenging to implement a fair and effective pricing model that incentivizes conservation (Beecher 2011). If water usage cannot be measured accurately, consumers may not see a direct correlation between their conservation efforts and their bills, reducing the incentive to save water. Therefore, if the answer is no, pursue water conservation strategies that do not rely on water rate structures.
2. Can the community's socioeconomic diversity be accommodated within the proposed pricing structure without disproportionately impacting low-income households? Socioeconomic diversity can affect the fairness and acceptance of tiered pricing structures. If a pricing structure places a significant financial strain on low-income households, it could lead to inequities and resistance to

the pricing model (Teodoro 2010). Ensuring that water remains affordable for all income levels is essential for the public acceptance and success of the pricing strategy. Therefore, if the answer is no, pursue water conservation strategies that do not rely on water rate structures.

3. Will the proposed water rate structure provide clear and immediate feedback to consumers about their water usage and associated costs? Effective communication of water usage and costs through billing can encourage conservation. Research indicates that transparent billing practices and frequent feedback are critical for driving consumer behavior change (Ferraro and Price 2013). If consumers do not receive timely and clear information about their water usage and costs, they are less likely to adjust their behavior in response to pricing signals. Therefore, if the answer is no, pursue water conservation strategies that do not rely on water rate structures.
4. Is there evidence that changing the water rate structure will lead to significant behavior change among consumers? Behavioral responses to pricing changes are essential for the success of conservation-oriented rate structures. Studies show that although price signals can influence water usage, the degree of behavior change varies significantly depending on the context and implementation (Olmstead and Stavins 2009). Therefore, if the answer is no, pursue water conservation strategies that do not rely on water rate structures.

To help answer question number 4 above, it may help to recall that, on average, when customers are directly confronted with a 10% increase in the cost of water, they are likely to respond by reducing water use by approximately 5% (Dalhuisen et al. 2003; Gardner and Simmons 2012).⁸ It may also help to answer the additional questions below.

1. Does the current pricing structure rely heavily on property tax revenue or flat fees? If the answer is yes, it is less likely that adjustments to water rates will bring about material changes in water use. Unless it is desirable and practical to shift away from taxes and flat fees by increasing reliance on water rates, it may be more effective to pursue other conservation strategies.
2. Do prices already reflect the marginal cost of delivered water? If yes, any water rate modifications may need to be revenue neutral (or a double dividend approach may be considered). Under these circumstances, it may be more effective to pursue other conservation strategies.
3. Are there a few very-high-volume water users that drive overall water use? If yes, will they be responsive to the potential water rate structure, and what are the implications of their response?⁹ Should an approach be tailored to very-high-volume water users?

If adjustments to water rate structures are identified as a preferred component of a water conservation strategy, the following items should be considered:

1. Opposition to water rate changes, even if they are revenue neutral, should be expected. Customers often have no choice in water provider and so may feel trapped. In addition, both customers and politicians may (correctly) perceive that modified rate structures are an attempt to encourage behavior that customers would otherwise not adopt. In this context, it may be helpful to implement a public outreach and education process as part of any water conservation program.

⁸ For a more nuanced approach to estimating the effect of a water rate change on water consumption, see Edwards and Sutherland (2019).

⁹ Most very-high-volume water users are large commercial or industrial customers. When these customers change their behavior, impacts can ripple throughout the water delivery system and the economy as a whole. Such ripples can have confounding effects on water usage.

From an administrative standpoint, the merits of a phased implementation as opposed to a single change should be considered.

2. The entities responsible for any water rate change must be prepared to demonstrate that the change is revenue neutral and/or will not result in profits accruing to the water provider. If the proposed water rate changes include a shift away from property taxes and/or fixed fees, potential implications related to revenue predictability, borrowing costs, equity, and other cascading effects should be considered. This review should entail legal support, accounting support, and support from someone familiar with potential linkages between water-related revenues and the broader funding of government activities.
3. Where a proposed water rate structure applies to large commercial and/or industrial water users, an economic study of the rate structures cascading impacts may be warranted.
4. Billing should be designed to clearly convey the link between reduced water consumption and reduced water bills. Edwards and Sutherland (2019) suggest that framing this information as the amount of money the customer would have saved had they consumed X fewer gallons of water last month may be effective. Adding information describing a common action that would bring about the specified reduction in water use may also be helpful. Finally, integrating conservation messages into bills (that is, explaining the benefits of water conservation beyond monetary savings) may also be effective.

3.2 Additional Detail Regarding Water Rate Structures

This section serves as a practical extension of the theory and policy concepts discussed in the preceding sections. Specifically, we provide detailed examples of different water rate structures—tiered, flat, and seasonal—tailored to various user categories (residential, commercial, and public/institutional). These are designed to meet the unique needs of different city types, including secondary water communities, urban/suburban, and rural-developing areas.

Each example is intended to illustrate potential water conservation applications and offer a tangible guide for municipalities or utilities considering if and how to select water rate structures to encourage water conservation. The examples are crafted to reflect diverse conservation goals and economic considerations, showcasing a range of approaches. Rather than predicting specific impacts, which will vary according to the area of implementation, the goal is to provide an understanding of the different pricing structures, enabling decision-makers to effectively think about impacts, assess economic and social feasibility, and refine water policies over time.

3.2.1 User Classification

Effective management of water resources often begins by categorizing users. This report considers three user categories for primary water users—residential, commercial, and public/institutional. Each is defined by a range of meter sizes, and distinguishing between categories enables the development of targeted rate structures that reflect the varied usage patterns in each user category. In contrast, secondary water systems can adopt a different categorization approach. Residential use remains relevant, but now there is a broader commercial/agricultural category, which accommodates a spectrum of uses. Meter sizes in this sector are less standardized than in primary systems, benefiting from flexible management strategies. In putting forward the meter size classification, we recognize that there are other ways to categorize users, such as land use, which may be more applicable for specific water providers. The key is that any categorization scheme should 1) be readily implemented with available data and 2) enable the tailoring of water rate structures to specific user groups for a specific policy purpose.

The meter size classifications for **primary water systems** are detailed below, illustrating how these specifications cater to the distinct needs of each user group and facilitate targeted rate structuring.¹⁰

Residential

- Small meter ($\frac{5}{8}$ inch): Typically used in single-family homes with standard water needs.
- Medium meter ($\frac{3}{4}$ inch): For larger homes or those with additional water features, such as pools or extensive landscaping.
- Large meter (1 inch): Applies to multi-family units or high-demand residential buildings.

Commercial

- Small meter (1 inch): Small businesses with moderate water needs.
- Medium meter (1.5 inches): Medium-sized facilities, including restaurants and office buildings.
- Large meter (2 inches and above): Large commercial operations, including manufacturing plants and large office complexes.

Public/Institutional

- Small meter (1.5 inches): Small public facilities, such as schools and libraries.
- Medium meter (2 inches): Hospitals, large schools, and government buildings.
- Large meter (3+ inches): Major public venues and large institutional complexes.

Secondary water systems are increasingly being equipped with their own meters to allow for more precise usage tracking and billing. Unlike primary water, the categorization of secondary water users into residential and commercial/agricultural is based on the distinct demands of non-potable water. Residential use typically involves lower volumes for landscaping, whereas commercial and agricultural use requires much larger volumes due to operational needs and agricultural cycles.

Residential: In residential areas, secondary water is primarily used for landscaping and garden irrigation. Meters installed for these purposes generally align with those used in primary systems to measure non-potable supply. The emphasis is more on the application rather than the specific size of the meter.

Commercial/Agricultural: In commercial and agricultural settings, which typically require more substantial water volumes, the meters accommodate higher flows needed for extensive irrigation. These settings often include everything from medium-sized facilities and farms to larger industrial operations.

3.2.2 City Type Classification

Water resource management may be improved by considering the characteristics of specific community types, as each type may have some common attributes that lend themselves to specific rate structuring strategies. In this report, we categorize city types into three main groups typical to the greater GSL area—secondary water communities, urban/suburban areas, and rural-developing growing areas—to showcase a range of approaches to water management.

¹⁰ An industrial user classification is not included within the current public/institutional tiered pricing schedule. Due to the specific and varied water usage requirements of industrial users, which differ significantly from public and institutional facilities, it is advisable for rate-setting authorities to negotiate water rates directly with industrial entities. This approach allows for the development of customized pricing strategies that not only accommodate diverse industrial demands but also support economic development objectives while managing high water usage in line with conservation goals.

In discussing these three community types, we acknowledge that categories often overlap. For example, a community might use secondary water systems while experiencing rural growth dynamics. Sometimes, blending strategies from different categories may be necessary to effectively address the unique combination of characteristics in a given area. This section offers a starting point for thinking about water rate structures, which calls for flexible and context-aware planning.

3.2.2.1 SECONDARY WATER COMMUNITIES

These areas primarily use non-potable water for irrigation, reducing the demand for potable water supplies. Rate structures in these communities may be designed to a) incentivize the reservation of potable water for essential needs; b) encourage potable water conservation among “excessive” potable water users; and c) encourage water conservation among all secondary water users. It is important that the cost of secondary water remains lower than that of potable water to prevent users from switching to potable water for irrigation. Working within that constraint, a secondary water rate structure with many small blocks and rapidly increasing prices may be effective.

3.2.2.2 URBAN/SUBURBAN AREAS

The rate structures for urban and suburban areas may benefit from being adaptable, which helps to manage substantial water use while encouraging residents to adopt water-saving technologies and practices. This focused approach helps ensure that water management strategies are practical and fair, supporting sustainable development in urban and suburban areas. These areas contain unique features, such as the following:

- **Urban Features:** Urban areas typically include high-rise buildings, mixed-use developments, and cultural institutions. These features contribute to a more compact living environment where per capita water use is often relatively low.
- **Suburban Features:** Suburban areas are characterized by single-family homes, shopping malls, and large parking lots. The spread-out nature of these areas often leads to greater water usage per capita, particularly for yard and garden maintenance.

Water conservation strategies in urban areas may want to focus on a) incentivizing water conservation across common indoor activities, such as laundry, dishes, and bathing, or b) reducing water waste and leakage. In a residential area, this may require instituting very small blocks associated with increasing prices over even modest water usage as a typical urban family of four might only use 10,000 to 15,000 gallons of water per month.

In more suburban areas, there may be more opportunities to develop rate structures that encourage the conservation of water that would otherwise be used for landscaping or backyard recreation. This may call for a large increase in price around 10,000 or 15,000 gallons.

Policymakers should take care to assure that differential price structures do not push urban residents into suburban areas, where water usage per capita tends to be higher.

3.2.2.3 RURAL-DEVELOPING AREAS

With population increases and infrastructure development, water demand may increase even if per capita water use declines. This puts pressure on local water suppliers, so it is important to develop rate structures that accommodate necessary infrastructure development while ensuring sustainable water use.

Because these areas may be transitioning from a small number of large-volume water users (agricultural use) to a larger number of smaller water users, special attention should be paid to the water conservation signal being sent to both user groups. It is also possible in these settings that seasonal water rate structures may be effective, as water use may increase materially during the summer growing season.

3.2.3 Pricing Structures

3.2.3.1 CONTEXT AND DEVELOPMENT OF RATES

The water rate structures presented in this report serve as conceptual models to illustrate various pricing strategies and their potential applications. These rates were developed using a combination of industry standards, existing pricing structures in the area, and best practices in water resource management. The numbers were developed to be within a reasonable range but should not be viewed as strict recommendations. Instead, they are intended to demonstrate relative differences that could be considered, highlighting where some rates might be higher and how they compare across different categories, tiers, and communities. This approach helps to visualize potential pricing strategies and their implications for different user groups.

Several considerations informed the development of these rates:

1. **Industry Standards:** The base rates and tiered structures align with common practices observed in various municipalities and water districts. Rates were adjusted to reflect typical cost variations seen in urban/suburban and rural-developing areas.
2. **Existing Pricing Structures:** Existing consumption data and pricing structures were analyzed to identify typical water usage patterns for different user categories (residential, commercial/agricultural, and public/institutional). This data helps in setting realistic thresholds for base prices and tiered rates.
3. **Conservation Goals:** Rates were structured to promote conservation by incentivizing efficient water use and penalizing excessive consumption. The application of price variation to achieve actual conservation goals will vary by location and conservation goal.
4. **Secondary Water Considerations:** Rates were set lower than primary water for secondary water systems to encourage the use of non-potable water for irrigation and other non-drinking purposes. This strategy supports conservation by reducing the demand for potable water supplies.

3.2.3.2 TIERED PRICING

Tiered pricing is a rate structure where the cost of water increases with higher consumption levels. This strategy is designed to encourage water conservation by assigning higher charges to those who place a higher demand on water resources. It incorporates two main considerations: determining specific usage thresholds that define each tier and establishing a base price along with progressively higher prices for subsequent tiers.

3.2.3.2.1 Tier Selection

Selecting the appropriate tiers for tiered pricing involves the careful analysis of water usage data to ensure the thresholds encourage conservation without being perceived as punitive.

Ideally, tiers are structured around significant usage thresholds that reflect typical consumption patterns. For instance, in a residential setting, the first tier might cover basic domestic needs, such as drinking, cooking, and hygiene, usually up to a certain number of gallons per household per month. Subsequent

tiers can then be designed to account for nonessential uses, such as watering gardens or filling pools, which are generally more variable.

By aligning tiers with these natural breaks in usage, utilities can create a more responsive and equitable pricing system that effectively targets excessive water use while supporting essential daily needs. This strategy not only ensures that all community members have access to affordable water for basic needs but also places the responsibility for higher costs on those who consume more resources for nonessential water use.

Although the examples below outline a structure with three tiers, it is important to note that utilities can adjust the number of tiers to best fit water demand and achieve effective water conservation specific to their location. Below, we provide example tables (see Tables 6–13) to demonstrate one approach to determining different pricing tiers. Refer to Table 5 for examples of existing pricing structures.

3.2.3.2.2 Price Selection

Recognizing that a 10% increase in water prices typically results in an approximately 5% decrease in consumption, utilities can strategically set prices to influence user behavior and achieve specific conservation goals (Dalhuisen et al. 2003; Gardner and Simmons 2012). That said, price selection is a multifaceted question, which should account for the following considerations:

- To gain further insight into the prices likely to be needed to accomplish a specific conservation goal, water providers can estimate price elasticity through consumer surveys and analysis of historical usage data, providing insights into how different demographics respond to price changes. Additionally, real-time usage monitoring allows utilities to observe immediate responses to price adjustments and further tailor their pricing strategies.
- Water providers should, generally, ensure that taxes, fees, and water rates cover the costs of water supply, including treatment and distribution.
- Engaging stakeholders through public consultations can help align these rates with community expectations and enhance the acceptance of higher rates for nonessential consumption.
- Benchmarking against similar utilities can provide insights that help refine pricing strategies to balance conservation incentives with customer satisfaction and financial sustainability.

Water providers must ensure that any rate adjustment remains revenue neutral to prevent profit accrual. Any shift from fixed to usage-based pricing must continue to comply with this legal mandate. Revenue exceeding operational costs can be directed toward further conservation initiatives, community benefit programs, or other government activities. Implementing these adjustments requires careful coordination with legal and financial advisors to ensure compliance and effective fund allocation.

3.2.3.2.3 Recommended Rate Structures

Tables 6 through 13 are recommended tiered rate structures for different community and property types.¹¹

¹¹ Each element of Tables 6 through 13 is further explained in Section 3.2.3.7.

Table 6. Tiered Primary Water Rate Structure for Residential Properties in an Urban/Suburban Community Type

Meter Size	Monthly Base Price (includes up to 3,000 gallons)	Tier 1 (3,001–6,000 gallons)			Tier 2 (6,001–15,000 gallons)			Tier 3 (15,001–25,000 gallons)			Tier 4 (25,001+ gallons)		
		Using Secondary Water	Secondary Water Available but Not Using	No Secondary Water Available	Using Secondary Water	Secondary Water Available but Not Using	No Secondary Water Available	Using Secondary Water	Secondary Available but Not Using	No Secondary Water Available	Using Secondary Water	Secondary Available but Not Using	No Secondary Water Available
Small (5/8 inch)	\$15	\$1.00	\$1.00	\$1.00	\$1.75	\$2.00	\$1.75	\$2.50	\$5.00	\$2.50	\$4.50	\$9.00	\$4.50
Medium (3/4 inch)	\$20	\$1.50	\$1.50	\$1.50	\$2.25	\$2.75	\$2.25	\$3.00	\$6.00	\$3.00	\$5.40	\$10.80	\$5.40
Large (1 inch)	\$25	\$2.00	\$2.00	\$2.00	\$3.00	\$3.50	\$3.00	\$4.00	\$8.00	\$4.00	\$7.20	\$14.40	\$7.20

Note: After monthly base price, prices for Tier 1 through Tier 4 are per 1,000 gallons.

Table 7. Tiered Primary Water Rate Structure for Residential Properties in a Rural-Developing Community Type

Meter Size	Monthly Base Price (includes up to 3,000 gallons)	Tier 1 (3,001–6,000 gallons)			Tier 2 (6,001–15,000 gallons)			Tier 3 (15,001–25,000 gallons)			Tier 4 (25,000+ gallons)		
		Using Secondary Water	Secondary Water Available but Not Using	No Secondary Water Available	Using Secondary Water	Secondary Water Available but Not Using	No Secondary Water Available	Using Secondary Water	Secondary Available but Not Using	No Secondary Water Available	Using Secondary Water	Secondary Available but Not Using	No Secondary Water Available
Small (5/8 inch)	\$10	\$0.90	\$0.90	\$0.90	\$1.60	\$2.00	\$1.60	\$2.25	\$4.50	\$2.25	\$4.05	\$8.10	\$4.05
Medium (3/4 inch)	\$15	\$1.35	\$1.35	\$1.35	\$2.00	\$2.50	\$2.00	\$2.70	\$5.40	\$2.70	\$4.86	\$9.72	\$4.86
Large (1 inch)	\$20	\$1.80	\$1.80	\$1.80	\$2.70	\$3.40	\$2.70	\$3.60	\$7.20	\$3.60	\$6.48	\$12.96	\$6.48

Note: After monthly base price, prices for Tier 1 through Tier 4 are per 1,000 gallons.

Table 8. Tiered Primary Water Rate Structure for Commercial Properties in an Urban/Suburban Community Type

Meter Size	Monthly Base Price (includes up to 5,000 gallons)	Tier 1 (5,001–10,000 gallons)			Tier 2 (10,001–20,000 gallons)			Tier 3 (20,001–50,000 gallons)			Tier 4 (50,000 + gallons)		
		Using Secondary Water	Secondary Water Available but Not Using	No Secondary Water Available	Using Secondary Water	Secondary Water Available but Not Using	No Secondary Water Available	Using Secondary Water	Secondary Available but Not Using	No Secondary Water Available	Using Secondary Water	Secondary Available but Not Using	No Secondary Water Available
Small (1 inch)	\$30	\$2.00	\$2.00	\$2.00	\$3.50	\$4.50	\$3.50	\$4.50	\$9.00	\$4.50	\$8.10	\$16.20	\$8.10
Medium (1.5 inches)	\$50	\$2.50	\$2.50	\$2.50	\$4.00	\$5.25	\$4.00	\$5.00	\$10.00	\$5.00	\$9.00	\$18.00	\$9.00
Large (2+ inches)	\$75	\$3.00	\$3.00	\$3.00	\$4.50	\$6.00	\$4.50	\$6.00	\$12.00	\$6.00	\$10.80	\$21.60	\$10.80

Note: After monthly base price, prices for Tier 1 through Tier 4 are per 1,000 gallons.

Table 9. Tiered Primary Water Rate Structure for Commercial Properties in a Rural-Developing Community Type

Meter Size	Monthly Base Price (includes up to 5,000 gallons)	Tier 1 (5,001–10,000 gallons)			Tier 2 (10,001–20,000 gallons)			Tier 3 (20,001–50,000 gallons)			Tier 4 (50,001+ gallons)		
		Using Secondary Water	Secondary Water Available but Not Using	No Secondary Water Available	Using Secondary Water	Secondary Water Available but Not Using	No Secondary Water Available	Using Secondary Water	Secondary Available but Not Using	No Secondary Water Available	Using Secondary Water	Secondary Available but Not Using	No Secondary Water Available
Small (1 inch)	\$20	\$1.50	\$1.50	\$1.50	\$3.00	\$3.75	\$3.00	\$3.75	\$7.50	\$3.75	\$6.75	\$13.50	\$6.75
Medium (1.5 inches)	\$35	\$2.00	\$2.00	\$2.00	\$3.50	\$4.40	\$3.50	\$4.25	\$8.50	\$4.25	\$7.65	\$15.30	\$7.65
Large (2+ inches)	\$50	\$2.50	\$2.50	\$2.50	\$4.00	\$5.00	\$4.00	\$4.75	\$9.50	\$4.75	\$8.55	\$17.10	\$8.55

Note: After monthly base price, prices for Tier 1 through Tier 4 are per 1,000 gallons.

Table 10. Tiered Primary Water Rate Structure for Public/Institutional Properties in an Urban/Suburban Community Type

Meter Size	Monthly Base Price (includes up to 10,000 gallons)	Tier 1 (5,001–10,000 gallons)			Tier 2 (10,001–20,000 gallons)			Tier 3 (20,001–50,000 gallons)			Tier 4 (50,001+ gallons)		
		Using Secondary Water	Secondary Water Available but Not Using	No Secondary Water Available	Using Secondary Water	Secondary Water Available but Not Using	No Secondary Water Available	Using Secondary Water	Secondary Available but Not Using	No Secondary Water Available	Using Secondary Water	Secondary Available but Not Using	No Secondary Water Available
Small (1.5 inches)	\$15	\$1.50	\$1.50	\$1.50	\$2.00	\$2.50	\$2.00	\$3.00	\$6.00	\$3.00	\$5.40	\$10.80	\$5.40
Medium (2 inches)	\$25	\$2.00	\$2.00	\$2.00	\$2.75	\$3.50	\$2.75	\$3.75	\$7.50	\$3.75	\$6.75	\$13.50	\$6.75
Large (3+ inches)	\$35	\$2.50	\$2.50	\$2.50	\$3.25	\$4.25	\$3.25	\$4.50	\$9.00	\$4.50	\$8.10	\$16.20	\$8.10

Note: After monthly base price, prices for Tier 1 through Tier 4 are per 1,000 gallons.

Table 11. Tiered Primary Water Rate Structure for Public/Institutional Properties in a Rural/Developing Community Type

Meter Size	Monthly Base Price (includes up to 10,000 gallons)	Tier 1 (5,001–10,000 gallons)			Tier 2 (10,001–20,000 gallons)			Tier 3 (20,001–50,000 gallons)			Tier 4 (50,001+ gallons)		
		Using Secondary Water	Secondary Water Available but Not Using	No Secondary Water Available	Using Secondary Water	Secondary Water Available but Not Using	No Secondary Water Available	Using Secondary Water	Secondary Available but Not Using	No Secondary Water Available	Using Secondary Water	Secondary Available but Not Using	No Secondary Water Available
Small (1.5 inches)	\$15	\$1.25	\$1.25	\$1.25	\$1.75	\$2.25	\$1.75	\$2.50	\$5.00	\$2.50	\$4.50	\$9.00	\$4.50
Medium (2 inches)	\$25	\$1.75	\$1.75	\$1.75	\$2.25	\$2.85	\$2.25	\$3.00	\$6.00	\$3.00	\$5.40	\$10.80	\$5.40
Large (3+ inches)	\$35	\$2.25	\$2.25	\$2.25	\$2.75	\$3.50	\$2.75	\$3.75	\$7.50	\$3.75	\$6.75	\$13.50	\$6.75

Note: After monthly base price, prices for Tier 1 through Tier 4 are per 1,000 gallons.

Table 12. Tiered Secondary Water Rate Structure for an Urban/Suburban Community Type

Category	Meter Size	Monthly Base Price	Tier 1 (gallons)	Tier 1 Price	Tier 2 (gallons)	Tier 2 Price	Tier 3 (gallons)	Tier 3 Price	Tier 4 (gallons)	Tier 4 Price
Residential Irrigation	1 inch	\$10 for 5,000 gallons	5,001–15,000	\$0.75	15,001–25,000	\$1.25	25,001–50,000	\$1.75	50,000+	\$3.15
	1.5 inch	\$15 for 5,000 gallons		\$1.00		\$1.50		\$2.00		\$3.60
	2 inch	\$20 for 5,000 gallons		\$1.25		\$1.75		\$2.25		\$4.05
Commercial/Agricultural/ Public	1.5 inch	\$20 for 20,000 gallons	20,001–40,000	\$1.50	40,001–60,000	\$2.50	60,001–100,000	\$3.50	100,000+	\$6.30
	2 inch	\$25 for 20,000 gallons		\$1.75		\$2.75		\$3.75		\$6.75
	3+ inch	\$30 for 20,000 gallons		\$2.00		\$3.00		\$4.00		\$7.20

Note: After monthly base price, prices for Tier 1 through Tier 4 are per 1,000 gallons.

Table 13. Tiered Secondary Water Rate Structure for a Rural-Developing Community Type

Category	Meter Size	Monthly Base Price	Tier 1 (gallons)	Tier 1 Price	Tier 2 (gallons)	Tier 2 Price	Tier 3 (gallons)	Tier 3 Price	Tier 4 (gallons)	Tier 4 Price
Residential Irrigation	1 inch	\$8 for 5,000 gallons	5,001–15,000	\$0.60	15,001–25,000	\$1.00	25,001–50,000	\$1.50	50,000+	\$2.70
	1.5 inch	\$12 for 5,000 gallons		\$0.80		\$1.30		\$1.80		\$3.24
	2 inch	\$16 for 5,000 gallons		\$1.00		\$1.50		\$2.00		\$3.60
Commercial/Agricultural/ Public	1.5 inch	\$20 for 20,000 gallons	20,001–40,000	\$1.50	40,001–60,000	\$2.50	60,001–100,000	\$3.50	100,000+	\$6.30
	2 inch	\$25 for 20,000 gallons		\$1.75		\$2.75		\$3.75		\$6.75
	3+ inch	\$30 for 20,000 gallons		\$2.00		\$3.00		\$4.00		\$7.20

Note: After monthly base price, prices for Tier 1 through Tier 4 are per 1,000 gallons.

3.2.3.3 FLAT RATE PRICING

Flat rate pricing involves a consistent charge for each unit of water used, regardless of the volume consumed. This model simplifies billing and increases revenue predictability but is not as effective at incentivizing water conservation as a tiered structure.

3.2.3.3.1 Price Selection

Although the conservation incentives are not as clear in flat rate pricing since the cost of water does not increase with usage volume, flat rate pricing can still support water conservation strategies through careful rate increases. However, by strategically adjusting rates—considering that a 10% increase in water prices typically results in a 5% decrease in water consumption—utilities may effectively encourage conservation. Initial rate settings could ideally first cover the essential costs of water supply, treatment, and distribution. From there, utilities could benefit from regularly reviewing and modifying these rates based on analyses of how price changes influence consumer behavior, known as price elasticity. This can be gauged through analyzing usage data and engaging with consumers directly through surveys. Similarly, incorporating real-time monitoring into this strategy allows for observing how consumption patterns shift in response to rate adjustments, facilitating timely and data-driven responses. It is helpful to involve the community in this process through public consultations, ensuring that rate changes meet local expectations and address equity considerations, particularly to avoid disproportionately impacting economically disadvantaged groups.

3.2.3.3.2 Recommended Rate Structures

Tables 14 through 18 provide recommended flat rate structures for different community and property types.

Table 14. Flat Rate Primary Water Rate Structures for Residential Properties

Community Type	Meter Size	Using Secondary Water (per 1,000 gallons)	Secondary Water Available but Not Using (per 1,000 gallons)	No Secondary Water Available (per 1,000 gallons)
Urban/Suburban	Small ($\frac{5}{8}$ inch)	\$2.25	\$3.00	\$2.50
	Medium ($\frac{3}{4}$ inch)	\$2.35	\$3.10	\$2.60
	Large (1 inch)	\$2.45	\$3.20	\$2.70
Rural-Developing	Small ($\frac{5}{8}$ inch)	\$1.75	\$2.50	\$2.00
	Medium ($\frac{3}{4}$ inch)	\$1.85	\$2.60	\$2.10
	Large (1 inch)	\$1.95	\$2.70	\$2.20

Table 15. Flat Rate Primary Water Rate Structures for Commercial Properties

Community Type	Meter Size	Using Secondary Water (per 1,000 gallons)	Secondary Water Available but Not Using (per 1,000 gallons)	No Secondary Water Available (per 1,000 gallons)
Urban/Suburban	Small (1 inch)	\$4.25	\$5.00	\$4.50
	Medium (1.5 inches)	\$4.75	\$5.50	\$5.00
	Large (2+ inches)	\$5.25	\$6.00	\$5.50
Rural-Developing	Small (1 inch)	\$3.75	\$4.50	\$4.00
	Medium (1.5 inches)	\$4.00	\$4.75	\$4.25
	Large (2+ inches)	\$4.25	\$5.00	\$4.50

Table 16. Flat Rate Primary Water Rate Structures for Public/Institutional Properties

Community Type	Meter Size	Using Secondary Water (per 1,000 gallons)	Secondary Water Available but Not Using (per 1,000 gallons)	No Secondary Water Available (per 1,000 gallons)
Urban/Suburban	Small (1.5 inches)	\$3.25	\$4.00	\$3.50
	Medium (2 inches)	\$3.50	\$4.25	\$3.75
	Large (3+ inches)	\$3.75	\$4.50	\$4.00
Rural-Developing	Small (1.5 inches)	\$2.75	\$3.50	\$3.00
	Medium (2 inches)	\$3.00	\$3.75	\$3.25
	Large (3+ inches)	\$3.25	\$4.00	\$3.50

Table 17. Flat Rate Secondary Water Rate Structures for Residential Properties

Community Type	Meter Size	Rate per 1,000 gallons
Urban/Suburban	1 inch	\$1.50
	1.5 inch	\$1.75
	2 inch	\$2.00
Rural-Developing	1 inch	\$1.00
	1.5 inch	\$1.25
	2 inch	\$1.50

Table 18. Flat Rate Secondary Water Rate Structures for Commercial, Agricultural and Public Properties

Community Type	Meter Size	Rate per 1,000 gallons
Urban/Suburban	1.5 inch	\$2.75
	2 inch	\$3.00
	3+ inch	\$3.25
Rural-Developing	1.5 inch	\$2.00
	2 inch	\$2.25
	3+ inch	\$2.50

3.2.3.4 SEASONAL PRICING

Seasonal pricing is a strategic approach that adjusts water rates based on seasonal variations in water availability and usage patterns. This pricing strategy may be particularly effective during peak demand periods, which may occur during dry seasons or times of high water-intensive activities, such as irrigation. By charging higher rates during these peak times, utilities encourage conservation when water is scarcest, and conversely, they can reduce rates during wetter seasons when water is more abundant. This can help manage demand, alleviate strain on water infrastructure, and promote sustainable water usage.

Seasonal pricing can be seamlessly integrated into existing pricing frameworks:

- **Tiered Pricing:** Each tier includes a regular season and a peak season rate, with the peak rate being higher to encourage reduced consumption during times of scarcity.
- **Flat Rate Pricing:** Offers a standard rate for the regular season and a higher rate for the peak season, applied uniformly across all units consumed.
- **Sector-Specific Adjustments:** Tailors the rate increases to align with the specific usage patterns of residential, commercial, or public/institutional sectors during peak periods.

3.2.3.4.1 Price Selection

To develop an effective seasonal pricing model, utilities should consider the following:

- **Identify Peak Periods:** Analyze historical consumption data to pinpoint months with the highest demand, which might be due to climatic conditions or seasonal activities, such as farming.
- **Set Rate Differentials:** Establish rate differentials significant enough to motivate conservation without imposing undue hardship. This involves understanding the local economic impacts and the price elasticity of demand in the community.
- **Adjust Tier Thresholds:** Consider more stringent thresholds for each tier during peak periods to reflect the increased value and decreased availability of water. For example, reducing the volume limits in higher tiers can make higher rates kick in sooner, strengthening conservation incentives.
- **Engage Stakeholders:** Engage with the community through consultations to ensure that the seasonal pricing model aligns with local needs and capacities, fostering community support and compliance.
- **Monitor and Adjust:** Use real-time monitoring systems to track the effectiveness of seasonal pricing adjustments and refine the strategy based on actual water usage patterns and feedback from the community.

3.2.3.4.2 Recommended Rate Structure Adjustments

3.2.3.5 FLAT RATE STRUCTURE

Table 19 provides recommended rate structure adjustments for flat rates, accounting for seasonal pricing.

Table 19. Seasonal Pricing Recommended Rate Adjustments for Flat Rate Water Rate Structure

Season	Rate (per 1,000 gallons)
Regular season	\$2.50
Peak season	\$3.00

3.2.3.6 TIERED PRICING STRUCTURE

Table 20 provides recommended rate structure adjustments for tiered rates, accounting for seasonal pricing.

By clearly communicating these adjustments through billing statements and public awareness initiatives, utilities can help customers understand the reasons for seasonal price variations and how they can adjust their water use accordingly. This proactive communication strategy supports broader goals of sustainable water management, ensuring that pricing remains responsive to both environmental factors and community needs.

Table 20. Seasonal Pricing Recommended Rate Adjustments for Tiered Rate Water Rate Structure

Season	Base Price (includes up to 5,000 gallons)	Tier 1 (5,001–15,000 gallons)	Tier 2 (15,001–25,000 gallons)	Tier 3 (25,001–50,000 gallons)	Tier 4 (50,001+ gallons)	Adjustment for Seasonality
Regular season	\$15	\$1.00	\$1.75	\$2.50	\$4.50	Not applicable
Peak season	\$18	\$1.25	\$2.00	\$3.00	\$5.40	Lower upper limit to 5,000 gallons for Tier 1; 12,000 gallons for Tier 2 during peak season.

Note: After monthly base price, prices for Tier 1 through Tier 4 are per 1,000 gallons.

3.2.3.7 PRICING STRATEGIES EXPLAINED

The tables above serve as a conceptual model to demonstrate how to think about different pricing structures, including tiered, flat rate, and seasonal adjustments. The rates and structures provided do not directly apply to any community but are intended to illustrate the methodology behind structuring water prices in different systems. We included a base price and four tiers as an example. The removal of the base prices and adding or subtracting tiers should be tailored to the specific conservation needs and financial situation of a given community. It is important to note that the relative differences in prices across tiers and scenarios are the key focus, illustrating where and why prices increase. We further break down each element of these tables below, providing a detailed explanation of the considerations and strategies that inform their selection.

Tiered Pricing

- **Base Price:** Some tiered water rate structures include a base price to cover the essential operational costs of water utilities, ensuring the provision of basic water service is financially sustainable. This base price is a flat fee per month and accommodates up to the minimal water needs of a household, providing affordable access to essential water uses. Including a base price can lead to more predictable billing for consumers and ensures that certain fixed costs of the utility are covered, aiding in financial stability and planning. However, not all rate structures incorporate a base price; some may start immediately with tiered pricing to directly correlate all charges to usage levels, which can encourage conservation from the first gallon used. It is important to note that if the goal is to maximize water conservation, considering the elimination of base charges that include a set volume of water could further incentivize users to reduce consumption.¹² Instead, base charges could be strictly limited to covering the costs associated with meter maintenance and replacement.
- **Tier 1:** This tier is designed for average residential water usage, accommodating daily activities, such as cooking, cleaning, and personal hygiene. Pricing in this tier remains affordable, encouraging efficient use without penalizing necessary consumption. It provides a moderate step up from the base rate for households that use water within typical ranges.
- **Tier 2:** Tier 2 is targeted at households with higher consumption, which might include activities like frequent laundry and car washing or small-scale gardening. The pricing here is designed to reflect the increased demand on water resources and infrastructure, motivating users to implement more water-efficient practices.
- **Tier 3:** Tailored for significantly high water consumption, Tier 3 includes usage for filling large swimming pools and extensive landscaping irrigation. This tier's substantially higher rates are aimed at deterring wasteful practices and luxury consumption, reflecting the significant environmental impacts of such high usage levels.

¹² Should the decision be made to eliminate base prices, it will be necessary to recalibrate the tiered rate system to ensure that operational costs previously covered by these charges are still met. One effective strategy could be to increase the minimum charge in the first tier, which would ensure all users contribute to the utility's essential operational expenses while still promoting conservation from the first gallon used. Additionally, adjusting rates across all tiers might help distribute the financial impact evenly among all users. Creating larger differences between successive tiers could also discourage excessive use and promote conservation, particularly for nonessential water uses.

The implications of removing base prices might vary across different user groups. In residential settings, where water usage can significantly vary, base prices may provide a buffer that supports consistent service availability. Small commercial enterprises might also benefit from the predictability and fairness offered by base prices, especially when their water use does not reach high volumes. Conversely, for commercial entities with broader financial capabilities and consistent usage patterns, eliminating base prices could simplify billing and better encourage the adoption of water-efficient practices. This measure could be particularly beneficial in regions facing water scarcity, as making each unit of water financially significant could promote careful usage and support environmental sustainability.

- **Tier 4:** Reserved for exceptionally high water consumption, Tier 4 is designed as a stringent measure to curb excessive use that far exceeds typical residential needs. This tier's rates are substantially higher, serving as a strong economic disincentive against wasteful water practices. Such pricing is crucial for signaling the serious environmental and infrastructural strains caused by the highest levels of water consumption. By setting rates at this level, the utility aims to protect water resources and promote sustainability, ensuring that every drop is used responsibly and thoughtfully.¹³

Meter Size Differentiation

Differences in meter sizes reflect the anticipated water flow and consumption levels, with larger meters typically used in settings with higher consumption potential. Adjusted rates for larger meters align financial incentives with conservation goals, promoting efficient water use across various property sizes.

Secondary Water Use

Incorporating secondary water systems into water rate structures can be an effective way to conserve primary water resources for essential needs.

- **Using Secondary Water:** Provides the lowest rates to promote the use of non-potable water for suitable purposes, conserving potable water for essential needs.
- **Secondary Available Not Using:** Higher rates in this scenario, especially at higher tiers, discourage the underuse of available non-potable resources, aiming to maximize their utilization.
- **Only Potable:** Applies standard rates where no secondary water source is available, ensuring fairness in billing.
- **Separate Secondary Water Rate Structures:** Secondary water is typically metered separately and therefore can have its own pricing structure. Rates should be lower than primary water to incentivize its use.

Comparing Water Pricing across Sectors and Community Types

Residential

General Strategy: Rates typically focus on ensuring affordability for essential use, with increasing costs to discourage excessive consumption. Residential pricing often uses tiered rates to gently escalate costs as usage increases.

Urban/Suburban: May include higher base rates due to infrastructure demands and higher living costs. Conservation incentives are common to manage the high demand.

Rural-Developing: Rates may be structured to ensure affordability given lower average incomes; however, due to less dense infrastructure, the cost per unit may be higher. Strategies might include stronger incentives for using local water sources efficiently.

¹³ The rates in upper tiers of a pricing structure—Tier 4 in the case of the examples above—can also be strategically set to manage peak demand periods, which in many regions, including Utah, see water usage significantly increase due to activities such as extensive landscape irrigation, particularly in the summer months. These elevated rates help ensure that the costs associated with maintaining and expanding necessary infrastructure to meet such peaks are adequately covered, promoting more responsible water use during times of highest demand.

Commercial/Industrial

General Strategy: Commercial and industrial rates are often higher due to the larger volumes consumed and the potential environmental impact. Rates are designed to cover higher usage and encourage investments in water efficiency and recycling technologies.

Urban/Suburban: Given the dense economic activities, commercial entities may face higher tiered rates to manage significant water use within limited urban water resources. Incentives for sustainability can be more aggressive.

Rural-Developing: Although maintaining encouragement for efficiency, rates might be moderated to support economic activities crucial for local development. Pricing could be structured to attract businesses but still incorporate tiers to manage higher usage levels effectively.

Public/Institutional

General Strategy: Typically benefits from more stable, often subsidized rates to support services crucial to public welfare, like education and health care. Despite lower rates, there may be measures to promote water conservation.

Urban/Suburban: Due to higher budget allocations and operational scales, public and institutional facilities might receive structured incentives to implement large-scale water-saving projects.

Rural-Developing: Pricing might be even more supportive to ensure that essential public services are not financially burdened. However, the challenge remains to balance these lower rates with the need for conservation given potentially limited water resources.

3.2.3.8 COMPARATIVE ANALYSIS OF WATER PRICING SYSTEMS

After exploring the mechanics and considerations of tiered, flat rate, and seasonal pricing models, we now provide an overview of some of the advantages and disadvantages of each (Table 21). This guide is designed to help in choosing the most appropriate pricing structure, considering the varied goals and circumstances that water management entities may face.

Table 21. Advantages and Disadvantages of Different Water Pricing Structures

Pricing Structure	Description	Advantages	Disadvantages
Tiered	Rates increase with higher water usage levels—a design that encourages conservation by charging more for excessive use.	<p>Conservation Incentives: Can promote water conservation by charging higher rates as usage increases, effectively discouraging excessive use.</p> <p>Equity and Fairness: Can be more equitable as it aligns water bills with consumption levels, ensuring that heavier users pay more.</p>	<p>Complex Administration: Can be more complex to administer due to varying tiers and rates, potentially leading to billing confusion.</p> <p>Customer Dissatisfaction: There is a possible risk of disputes and dissatisfaction, especially from higher usage customers during periods of increased rates, such as droughts.</p>

Pricing Structure	Description	Advantages	Disadvantages
Flat rate	A uniform rate per unit of water consumed, regardless of the volume used.	<p>Simplicity and Predictability: Easier for both customers to understand and utilities to manage, offering predictable billing, which aids household budgeting.</p> <p>Administrative Efficiency: Simplifies the billing process, reducing administrative overhead for utilities.</p>	<p>Limited Conservation Incentives: May not effectively encourage water conservation as the rate does not increase with higher usage.</p> <p>Potential for Inequity: May be perceived as unfair by low-usage households since they pay the same rate per unit as high-usage households.</p>
Seasonal	Rates vary depending on the season, typically higher during peak demand periods and lower during off-peak times.	<p>Adaptive Demand Management: Prices adjust according to seasonal water supply and demand, encouraging conservation during critical periods.</p> <p>Resource Optimization: Helps to manage water resources more efficiently by aligning pricing with seasonal variations in availability.</p>	<p>Operational Complexity: Requires accurate forecasting and frequent adjustments to rates, increasing administrative complexity.</p> <p>Unpredictability for Consumers: Fluctuating prices can lead to customer dissatisfaction, particularly if there is a significant increase during high-demand periods.</p>

Choosing an appropriate water pricing system requires a detailed analysis of local conditions, including water supply patterns, community economic status, and consumption behaviors. Although tiered pricing may be suited for areas where conservation is a priority and water usage varies significantly among consumers, flat rate pricing could be more applicable in regions prioritizing billing simplicity and administrative ease. Seasonal pricing, however, is ideal for regions experiencing significant fluctuations in water availability due to seasonal changes.

Water utilities would benefit from engaging with their communities through consultations to ensure that any selected pricing strategy is well-received and meets the needs of all stakeholders. Additionally, continuous monitoring and adjustments are helpful to align the pricing strategy with actual water usage patterns and environmental conditions, ensuring long-term sustainability and community support.

4 WATER CONSERVATION INCENTIVES

This chapter focuses on outlining three different landscape conversion incentive-based approaches that aim to remove or reduce grass and replace it with water-efficient landscaping. The three approaches outlined are monetary rebate programs, free or discounted landscaping material programs, and incentivizing municipalities to adopt grass lawn replacement programs. The overarching public interest goal of landscape conversion incentives is to reduce water consumption in landscaping, thereby conserving water resources.

4.1 Role of Landscape Conversion Incentives in a Comprehensive Water Conservation Plan

An incentive program is a structured initiative designed to motivate or encourage individuals, organizations, or communities to take specific actions or achieve outcomes by offering rewards, benefits, or incentives in return. Incentives can take various forms, such as financial rewards, free access to materials, discounts, rebates, or social recognition, aiming to promote desired behaviors or results. Water conservation plans, required for water providers in Utah, contain existing and proposed water conservation measures that outline how the entity and the end culinary water user will conserve water and limit or reduce per capita consumption so that adequate water supplies are available for future needs (UDWR 2024b).

Lawns require significant amounts of water, especially in arid regions like Utah. By replacing grass lawns with drought-tolerant plants, rock gardens, or synthetic grass, water use can be drastically reduced. Landscape conversion incentive programs can play an important role in meeting the goals outlined in a water conservation plan. Grass lawn replacement and water-wise landscaping incentives can fulfill several crucial water conservation objectives, as follows:

- **Reducing Water Consumption:** By encouraging the adoption of grass lawn replacement and water-saving technologies and integrating water-wise plants and landscape practices, landscape conversion incentive programs aim to decrease outdoor water usage, which is particularly vital in Utah where water scarcity, drought, and the impact of a growing population are contributing to the drying of the GSL (GSL Advisory Council 2020).
- **Promoting Drought-Resistant Landscaping:** Programs, such as grass lawn replacement rebates, incentivize homeowners and businesses to switch to drought-resistant landscaping, reducing the demand for irrigation and supporting water security (Utah Water Savers 2024).
- **Lowering Utility Costs:** Participants can benefit financially through reduced water bills, as implementing water-efficient measures leads to lower water consumption and, consequently, lower utility costs (Gleick 2003).
- **Supporting GSL Level Goals:** Using less water on landscaping leaves more for Utah lakes and reservoirs. In turn, this reduces the need for upstream diversions of water, which contribute to declining GSL levels (GSL Advisory Council 2020; Utah Water Savers 2024).
- **Raising Public Awareness:** Incentive programs often include educational components, which increase public awareness about the importance of water conservation and encourage community-wide participation in water-wise practices. When people see the visible changes in their communities and understand the financial benefits, they may be more likely to participate. Educational campaigns and demonstration gardens can further encourage adoption of water-efficient landscaping practices (JVWCD 2024).
- **Deferring Water Development for Growth Population:** Utah's population has increased by almost 48% since 2000 and is projected to increase by another 49% by 2050 (Utah Water Savers 2024). This growth will convert more land into urban/suburban areas, which will increase municipal water demand. Water-wise landscaping will reduce water consumption and help ensure water is available for Utah's increasing population while deferring the need for additional water development projects.

Studies have shown that grass lawn replacement can lead to water savings of up to 50% to 70% for residential properties (California Department of Water Resources 2021; Municipal Water District of Orange County 2022; Southern Nevada Water Authority 2021). Initiatives in Utah are expected to show similar levels of effectiveness; for example, the Weber Basin Water Conservancy District (WBWCD) estimates that replacing grass lawns with drought-resistant landscaping could reduce outdoor water use by up to 50%. This is significant when yard irrigation accounts for up to 70% of household water use (Bowen Collins & Associates 2022). The state of Utah Legislature appropriated nearly \$500 million toward water conservation initiatives in 2023, including landscape conversion incentive programs, and UDWR actively supports communities in developing water conservation strategies in water conservation plans (UDWR 2024).

4.2 Landscape Conversion Incentive and Rebate Programs

There are several types of incentive programs, each with a unique approach to encouraging water-wise landscaping (Table 22). Each of these incentive types addresses different aspects of the transition to

water-wise landscaping, from financial assistance to technical support. By offering a range of incentives, programs can appeal to a broader audience and more effectively promote water conservation across different sectors of the community. The three incentive programs outlined in this section are as follows:

- Monetary rebate programs (Section 4.2.1)
- Free or discounted landscaping material programs (Section 4.2.2)
- Incentivizing municipalities to adopt landscape conversion programs (Section 4.2.3)

Economic incentives, such as rebates and free or discounted landscaping materials, reduce the costs property owners incur if they convert grass lawns to less water-intensive landscaping (see Sections 4.2.1 and 4.2.2). These financial benefits help offset the initial costs of grass lawn replacement and conversion to xeriscaping or other water-efficient landscapes. In Utah, to qualify for grass replacement incentives, municipalities must adopt water conservation ordinances for new development. This requirement can be combined with incentives to encourage municipalities to adopt a water conservation ordinance and take on other water conservation initiatives (see Section 4.2.3).

Table 22. Water-wise Landscaping Incentive Programs and their Tradeoffs

Incentive Program	Target Audience	Description	Advantages	Disadvantages
Direct monetary rebates	Residential properties, commercial/institutional properties	These programs offer cash incentives based on the area of grass removed. Participants may receive a set amount per square foot of grass replaced with drought-tolerant plants, xeriscaping, or permeable hardscapes. The goal is to make the financial benefits of converting to water-wise landscaping directly tangible to property owners.	Provides immediate financial incentive, making the initial cost of conversion more manageable. Easy to understand and attractive to property owners looking for a quick return on their investment.	The cost to the sponsoring agency can be high, limiting the number of participants it can support. May not fully cover the cost of high-quality drought-resistant landscaping, potentially affecting the quality of replacements.
Free or discounted landscape materials	Residential properties, commercial/institutional properties	To lower the barrier to landscaping changes, some programs offer free or discounted materials, such as drought-resistant plants, mulch, or drip irrigation systems. By reducing the initial investment required for conversion, these incentives make grass removal more accessible and appealing.	Lowers the barrier to entry by reducing the upfront costs of landscaping materials. Encourages the use of specific water-efficient plants and materials.	The selection of materials might be limited, restricting design options. Might not address the cost of labor for installation, which can be a significant part of the total cost.
Landscape design assistance	Residential properties, commercial/institutional properties	Recognizing that designing a water-wise landscape can be daunting, some incentive programs include free or discounted professional landscape design services. These services can help participants envision a beautiful, functional space without grass, ensuring that the new landscape meets their needs and preferences while conserving water.	Helps participants envision and implement a water-wise, attractive landscape design. Increases the likelihood of a successful conversion by providing expert guidance.	Offering professional services can be expensive, limiting the number of participants that can be supported. Participants may have to wait for available design services, delaying the project.
Water usage credits	Residential properties, commercial/institutional properties	Some utilities provide credits on water bills as an incentive for removing grass. These credits may be calculated based on the estimated water savings achieved by converting to a more water-efficient landscape.	Directly ties the incentive to water savings, encouraging ongoing conservation beyond the initial grass replacement. May offer long-term financial benefits that exceed the value of a one-time rebate.	The benefits are realized over time, which may be less motivating than immediate cash rebates. Calculating the credits can be complex and might not fully reflect the actual water savings.
Tax incentives	Residential properties, commercial/institutional properties	In some areas, participants in grass lawn removal programs may be eligible for state or federal tax incentives. These incentives can further offset the costs of converting to a water-wise landscape and provide a financial benefit come tax season.	Offers a financial benefit, which can reduce the net cost of grass lawn replacement and landscaping. Can be combined with other incentives for greater overall savings.	The process of claiming tax incentives can be complex and may require additional documentation. Benefits are realized only after tax filing, which may not motivate immediate action.

Incentive Program	Target Audience	Description	Advantages	Disadvantages
State incentives for municipalities	Municipalities, districts	The state can provide funding to municipalities for water conservation incentives through a combination of funds, grants, and incentive programs.	<p>Encourages municipalities to adopt water conservation ordinances.</p> <p>Statewide efforts can provide more uniformity and standardization to simplify the process for participants.</p> <p>Statewide programs may have access to larger pools of funding, including state budgets and federal grants.</p>	The cost to the state can be high, limiting the number of municipalities it can support.
Community grants	Municipalities, districts	For larger communal spaces or nonprofit organizations, some incentive programs offer grants to support the replacement of grass lawns and the installation of community gardens, public parks with drought-tolerant landscaping, or other communal green spaces that use water efficiently.	<p>Supports larger scale projects that can have a significant impact on community water savings.</p> <p>Can foster community involvement and support for water-wise landscaping.</p>	<p>The application process can be competitive and time-consuming.</p> <p>May require detailed project proposals and reporting, adding administrative overhead.</p>

4.2.1 Landscape Conversion Cash Rebate Programs

4.2.1.1 PROGRAMS IN UTAH

A grass lawn replacement cash rebate program provides financial incentives to property owners who replace their water-intensive grass lawns with drought-resistant landscaping. Participants apply for rebates, undergo inspections, and receive payments based on the square footage of grass removed and replaced with water-wise alternatives. UDWR, in partnership with four major water conservancy districts, offers up to \$3 per square foot for water-wise landscape conversions in cities that have adopted qualifying landscape ordinances (Table 23). This is a matching program where the UDWR pays half of the incentive amount offered by the conservancy district. For example, the WBWCD provides a \$2.50 per square foot rebate; if a qualified project is eligible for a \$2.50 rebate, UDWR will pay \$1.25, and WBWCD will pay the remaining \$1.25 per square foot. The Central Utah Water Conservancy District and the JWCD offer rebates ranging from \$0.50 to \$3 per square foot, depending on the location and adherence to water efficiency standards. The Washington Water Conservancy District offers a \$2 per square foot rebate in cities such as St. George and Ivins.

The water districts operate the incentive program within their service areas and the UDWR operates the program throughout the rest of the state. Communities within the service areas of these districts work with their district to adopt qualifying landscape ordinances with the required water efficiency standards outlined in Table 23 (and as developed in Chapter 2 of this toolbox). Communities outside a partner water district's service area, including unincorporated areas, will work with the UDWR and are required, at a minimum, to have the following water-efficient landscape ordinances for new construction:

- No lawn on parking strips or areas less than 8 feet in width in a new development.
- No more than 50% of front and side yard landscaped areas may be lawn in a new residential development. Lawn limitations do not apply to small residential lots with less than 250 square feet of landscaped area.
- In new commercial, industrial, institutional, and multi-family development common area landscapes, lawn areas shall not exceed 20% of the total landscaped area, outside of active recreation areas.

These communities include any in the following counties: Beaver, Box Elder, Cache, Carbon, Daggett, Emery, Garfield, Grand, Iron, Kane, Millard, Piute, Rich, San Juan, Sanpete, Sevier, Tooele, and Wayne. The program is managed through Utah Water Savers, and eligible cities and applications are available on the Utah Water Savers website (Utah Water Savers 2024).

Table 23. Landscape Conservation Incentive Programs in Utah

		Central Utah Water Conservancy District	Jordan Valley Conservancy District	Washington County Water Conservancy District	Weber Basin Water Conservancy District	Utah Division of Water Resources
Program Name		Landscape Incentive Program	Landscape Incentive Program	Water Efficient Landscape Program	Landscape Lawn Exchange	Landscape Incentive Program
Amount per Square Feet		\$0.50–\$3.00	\$0.50–\$3.00	\$2.00	\$1.00–\$2.50	\$1.50
Project Minimum		200 square feet	200 square feet	300 square feet	250 square feet	200 square feet
Annual Incentive Limit		\$50,000 per project	\$50,000 in aggregate	\$50,000 per project	\$50,000 in aggregate	\$50,000 in aggregate
Required Water Efficiency Standards						
Grass Allowances	Commercial	20% maximum outside of recreation areas	20% maximum outside of recreation areas	0%, unless it serves a functional purpose	15% maximum allowances for recreation areas	20% maximum outside of recreation areas
	Institutional	20% maximum outside of recreation areas	20% maximum outside of recreation areas	0%, unless it serves a functional purpose	15% maximum allowances for recreation areas	20% maximum outside of recreation areas
	Industrial	20% maximum outside of recreation areas	20% maximum outside of recreation areas	0%, unless it serves a functional purpose	15% maximum allowances for recreation areas	20% maximum outside of recreation areas
	Residential	35% maximum in front and side yards	35% maximum in front and side yards	8% of the lot size with a cap for large lots, which ranges from 1,500–2,500 square feet depending on the municipality	35% maximum in front and side yards	50% maximum in front and side yards
Plant cover at maturity		50%, not including tree canopy	50%, not including tree canopy	50%	35%, not including tree canopy, with exceptions for park strips	50%, not including tree canopy

Source: Utah Water Savers (2024).

4.2.1.2 COMPARISON TO OTHER STATES

Rebates on grass lawn replacement in surrounding states are similar to what Utah’s provides; however, states like Nevada and California offer some of the highest rebate amounts per square foot—up to \$5.00—which is \$2.00 more per square foot than what is offered in Utah (Table 24). Additionally, in states such as California, “stacked incentives” programs are being implemented to offer increased rebates for action that improve water supply and keep waterways clean. Stacked incentives are defined as “customer incentive programs that are co-funded by two or more separate entities to motivate voluntary action on public or private property” (Diringer and Shimabuku 2021). For example, the County of San Diego and the San Diego County Water Authority have entered a 5-year “multi-benefit stacked incentives” program partnership as part of the County of San Diego’s Waterscape Rebate Program, which offers incentives for residential, commercial, and agricultural customers to implement projects that upgrade properties, save money, and improve water quality. Stacking incentives provides property owners with higher rebates for installing water-wise landscaping, rain-saving containers and features, and smart irrigation controllers, which in turn will lead to increased participation in the program. As Utah continues to allocate money toward water conservation incentive programs, stacking incentives could serve as an avenue for increased participation, which would aid in reaching water conservation goals.

Table 24. Summary of Landscape Conversion Rebates in Colorado, Nevada, California, and Arizona

Agency/Entity	Description	Rebate/Incentive amount	Link
Colorado			
Centennial Water and Sanitation District	A rebate for up to 1,000 square feet is available for the removal of any high-water-use plant material; the exact amount is dependent on replacement material.	\$2.50/square foot	https://www.centennialwater.org/conservation/rebates-and-incentives/turf-replacement-program-177
City and County of Broomfield	Broomfield residents can apply to receive rebates for the first 500 square feet and/or complimentary Garden in a Box kits (up to 300 square feet).	\$1.50/square foot	https://www.broomfield.org/3627/Lawn-Replacement-Program
Denver and surrounding municipalities	The nonprofit Resource Central offers a Lawn Replacement Program to support municipalities in grass lawn replacement rebates.	\$500–\$,1000 rebate depending on the service provider	https://resourcecentral.org/lawn/
City of Glenwood Springs	Grass lawn buyback program will pay \$2.00/square foot for 100 to 1,000 square feet of grass replacement.	\$2.00/square foot	https://garfieldcleanenergy.org/wp-content/uploads/2023/06/City-of-Glenwood-Springs-Turf-Buyback-Application-June-2023.pdf
City of Greeley	The Life after Lawn Program provided rebates (for 500 to 3,000 square feet of lawn) to replace well-watered grass front yards with water-wise landscaping.	\$1.00/square foot	https://greeleygov.com/services/ws/conservation/life-after-lawn
Town of Eagle/Town of Gypsum	Rebate for grass replacement for the Town of Eagle and the Town of Gypsum.	\$1.44–\$2.44/square foot	https://beyondlawn.org/rebate-amounts
Eagle River Water and Sanitation District	The district will pay up to \$2.00 per square foot of irrigated lawn if property owner replaces with native or drought-tolerant landscaping. The rebate is not to exceed the amount paid for landscape transformation (e.g., cost of services, materials, hired labor). There is a 100-square-foot minimum requirement but no maximum requirement.	\$2.00/square foot	https://www.erwsd.org/conservation/water-efficiency-rebates
Yampa Valley Sustainability Council	Yampa Valley Sustainability Council program will give a rebate of up to \$2.00 per square foot of grass lawn removed and replaced, with a maximum area of 2,000 square feet per project for up to two projects selected after the application period.	\$2.00/square foot	https://yvsc.org/yvsc-seeking-applicants-for-turf-replacement-money/
Nevada			
Southern Nevada Water Authority, includes Las Vegas	\$5.00 per square foot of grass removed and replaced with desert landscaping up to the first 10,000 square feet converted and \$3.50 per square foot thereafter per property.	\$5.00/square foot	snwa.com

Agency/Entity	Description	Rebate/Incentive amount	Link
California			
Southern California	Metropolitan Water District is offering a rebate of \$2.00 per square foot for 250 to 5,000 square feet of converted yard per year. Water agency may offer an additional rebate incentive.	\$2.00/square foot	socalwatersmart.com
County of San Diego	Residential and commercial properties may receive between \$2.00 and \$4.00/square foot of converted yard, up to 5,000 square feet for residential properties, and up to 10,000 square feet for commercial properties.	\$2.00–4.00/square foot	https://www.sandiegocounty.gov/content/sdc/dpw/watersheds/RebatesIncentives/Turf_Replacement.html
Los Angeles Department of Water and Power	The Turf Replacement Program by the Los Angeles Department of Water and Power offers residential customers up to \$5.00 per square foot for removing and replacing grass with drought-tolerant landscaping materials. Customers can receive a maximum rebate for up to 52,000 square feet, and the program provides design assistance to help participants plan their water-efficient landscapes.	\$3.00–5.00/square foot	https://www.ladwp.com/who-we-are/water-system/water-conservation/turf-replacement-program
Arizona			
Chandler	Save up to \$3,000 for replacing grass with a low-water-use landscape. This rebate is \$2.00 per square foot of grass removed.	\$2.00/square foot	https://www.chandleraz.gov/residents/water/water-conservation/rebate-and-incentive-programs
Mesa	Two levels of incentives are available: 500 to 999 square feet of grass conversion is eligible for \$750, and more than 1,000 square feet is eligible for \$1,000.	\$750–\$1,000	https://www.mesaaz.gov/residents/water/water-conservation/residential-grass-to-xeriscape-rebate
City of Scottsdale	Grass lawn replacement at \$1.00 per square foot.	\$1.00/square foot	https://prescottwater.com/rebates-incentives/
Bullhead City	Residential zoned properties may receive a 75% rebate on up to \$5,000 for a grass to artificial turf conversion and a 75% rebate on up to \$2,500 for a grass to rock and low-water-use plant conversion based off of the invoices submitted for the completed project.	\$2,500–\$5,000	https://www.bullheadcity.com/government/water-energy-resources/water-rebates

4.2.2 Free or Discounted Landscaping Material Programs

Free or discounted landscaping material programs are a type of incentive that also encourage the transition to water-wise landscaping and can serve as an alternative to rebates for property owners that are unable to pay the upfront cost associated with those programs. These programs provide an array of landscaping materials, such as drought-resistant plants, mulch for soil moisture retention and weed suppression, water-wise irrigation systems, and various hardscaping supplies designed to replace traditional lawns with more water-wise and aesthetically diverse alternatives at little to no cost to property owners. Beyond the material incentives, many programs extend design assistance through workshops or professional consultations, guiding homeowners in planning and executing water-wise gardens effectively.

Free or discounted landscaping material programs complement rebate programs and increase the accessibility of conservation efforts to households that may not have the resources to participate in rebate programs where funding by the participant is required up front.

4.2.2.1 PROGRAMS IN UTAH

In Utah, the City of South Jordan offers residents free rock mulch and drip system conversion kits, as well as \$300 for purchasing drought-tolerant plants. Salt Lake City Public Utilities offers a conservation-friendly grass seed blend (30% water savings per year compared to typical Kentucky bluegrass) at cost (5 pounds for \$18.23 + tax) (Table 25). Salt Lake Public Utilities further supports water conservation efforts by offering free water checks for households and commercial properties in collaboration with Utah State University's (USU's) Center for Water-Efficient Landscaping and the Metropolitan Water District of Salt Lake & Sandy, ensuring efficient water usage across the community. The JWCD partners with local nurseries to promote the sale of plants suited for Utah's climate, accompanied by educational lectures on sustainable landscaping, and LocalScapes offers free water-wise park strip designs. Additionally, USU offers a free customized pressurized sprinkler irrigation schedules for existing grass lawn areas to identify strategies for improvement for water conservation through their Water Check Program.

4.2.2.2 COMPARISON TO OTHER STATES

Water providers throughout Colorado have adopted programs that combine a mix of free resources and educational efforts. For example, Aurora Water offers income-qualified residents a free water-wise landscape replacement through the GreatScapes Program. The Mancos Conservation District and Thornton Water emphasize affordability and accessibility, offering discounts on garden kits and lawn removal services, to reduce barriers to adopting water-efficient landscaping. California's programs focus heavily on mulch and compost discounts and free mulch offerings to promote soil health and water retention. The City of San Bernardino and Ventura Water highlight educational workshops and irrigation retrofit programs, aiming to equip residents with knowledge and tools for efficient water use. The Metropolitan Water District of Southern California expands this support to both residential and commercial properties through its WaterSmart Checkup Program.

Table 25. Summary of Free or Discounted Landscaping Material Programs

Agency/Entity	Description	Incentive	Link
Utah			
Salt Lake City Public Utilities	Salt Lake City's Public Utilities' Water Conservation program has partnered with USU and the Turfgrass Water Conservation Alliance to offer a lower water grass seed for sale for customers within their service area in a program called SLC Turf Trade. This program offers the custom-blend grass seed at cost. This grass seed requires approximately 30% less water per year compared to a typical Kentucky bluegrass lawn.	Grass seed at cost: 5 pounds for \$18.23 + tax	https://www.slc.gov/utilities/conservation/slcturftrade/
South Jordan City	Residents of South Jordan that participate in the Flip Your Strip Program are eligible for free rock mulch and a drip system. The city of South Jordan will hand deliver drip systems and show residents how to properly install it. A maximum refund of \$300 will be provided to residents who remove grass and purchase drought-tolerant plants.	Free rock mulch and drip system conversion kit, \$300 plant rebate	https://www.sjc.utah.gov/532/Rebates
JVWCD	JVWCD teams with local nurseries to sell plants that work best in Utah. The plant sales also include lectures by experts in sustainable landscaping who discuss the best water-wise plants.	Water-wise plant sale	https://conservationgardenpark.org/events/467/plant-sale-at-conservation-garden-park/
Salt Lake Public Utilities	Salt Lake Public Utilities teamed with USU's Center for Water-Efficient Landscaping and the Metropolitan Water District of Salt Lake & Sandy to provide water checks to households and commercial properties within that service area.	Free water check	https://www.slc.gov/utilities/conservation/free-water-check/
Localscapes	Localscapes has develop ready-made plans that are adaptable to any size park strip. In addition, they offer free online and in-person classes, which teach landscaping patterns and practices that take into account Utah's unique climate.	Free park strip designs and classes	https://localscapes.com/designs https://localscapes.com/classes
USU	USU's Center for Water-Efficient Landscaping has a free Water Check Program, which provides customized pressurized sprinkler irrigation schedules for existing grass lawns to identify strategies and improvement for water conservation.	Free water check	https://extension.usu.edu/cwel/water-check
Colorado			
Aurora Water	Replaces grass lawns for free if household income is < 60% of median income.	Free grass replacement	https://www.auroragov.org/residents/water/water_conservation/GreatscapesProgram
Arvada	Free online Water-wise Yard Seminars taught by local landscape and horticulture professionals. Seminar topics include low-water landscape design, xeric plant selection, smart irrigation, and more. Both novice and advanced gardeners would learn something new. Seminars are held virtually via Zoom.	Free Water-wise Yard Seminars	https://resourcecentral.org/seminars/
Mancos Conservation District	Each spring and summer, a selection of professionally designed, low-water garden kits tailor-made for Colorado yards are offered at a discount.	\$25 discount on DIY Xeriscape Garden in a Box	https://resourcecentral.org/gardens/
Thornton Water	This program offers a 50% discount of \$1.00 per square foot (up to 500 square feet) to Thornton Water customers for lawn removal service to allow for water-wise plants.	50% off lawn removal service	https://www.thorntonwater.com/h2overhaul/

Agency/Entity	Description	Incentive	Link
California			
Contra Costa Water District and East May Municipal Utility District	Contra Costa Water District and East May Municipal Utility District have partnered with local nurseries, garden centers, and soil companies to offer discounts on mulch and compost.	10–20% off entire purchase \$10–25 off	https://www.ccwater.com/460/Landscape-Mulch-Coupons
City of San Diego	Free mulch from Miramar Greenery is available to San Diego residents with proof of residency.	Free mulch	https://www.sandiego.gov/environmental-services/miramar/greenery
City of San Bernardino	Free Water Smart Landscape Workshops are offered every spring and fall to customers to reduce their water use without sacrificing the outdoor beauty of their home.	Free workshops	https://www.sbmwd.org/259/Outdoor-Rebates-Incentives
Ventura	Ventura Water has an irrigation retrofit program that provides free high-efficiency sprinkler nozzles and professional installation	Free high-efficiency sprinkler nozzles and installation	https://www.removeyourturf.com/ventura-high-efficiency-nozzle
The Metropolitan Water District of Southern California	Free WaterSmart Checkup is a free opportunity to receive site-specific water-saving recommendations. Offered to both residential and commercial properties.	Free water use surveys	https://www.waterefficiencysurvey.com/

4.2.3 Incentivizing Municipalities to Adopt Landscape Conversion Programs

Widespread adoption of landscape conversion and water conservation programs across municipalities in the GSL basin is necessary to have a meaningful and measurable impact on water conservation and GSL levels. Providing municipalities with incentives, such as funding and technical assistance, can significantly enhance the reach and effectiveness of grass replacement programs. This assistance can encourage municipalities to adopt water conservation ordinances in order to be eligible for certain rebates. Certain municipalities may be resistant to these programs due to funding and limited staff and resources. State and federal programs can provide support in developing water conservation plans, adopting water conservation ordinances, and providing staff and technical assistance for running incentive programs, which will increase the number of individuals eligible to participate in grass replacement programs.

4.2.3.1 FUNDING AND FINANCING

4.2.3.1.1 Grant Funding

The state of Utah is funding a number of water conservation incentives through a combination of ongoing annual funds and one-time funds allocated by the Utah Legislature. The landscape incentive program received 3 million in ongoing annual funds and 5 million in one-time funding in 2022 (House Bill 121) and 2023 (Senate Bill 118). This funding supports water district and state grass replacement incentive programs.

The Bureau of Reclamation offers WaterSMART grants to assist water managers in the western United States and U.S. territories with projects aimed at improving water efficiency, renewable energy use, and water marketing strategies, as well as mitigating future water conflicts through a competitive, cost-shared funding process (Bureau of Reclamation 2024). These grants are divided into three categories: Water and Energy Efficiency Grants, Small-Scale Water Efficiency Projects, and Water Marketing Strategy Grants. Each is designed to support projects that align with specific goals, such as sustained water savings and enhanced drought resilience. Eligible applicants include a wide range of entities from states and tribes to nonprofit organizations acting in partnership with water or power delivery authorities. Priority is given to projects that offer broad sustainability benefits, including climate change mitigation and increased water management flexibility, with funding amounts varying by project scale and category.

In Utah, WaterSMART grants have been instrumental in advancing water conservation efforts across various projects. Among these, an initiative in Spanish Fork involved the modernization of the irrigation system through the installation of 1,000 smart irrigation controllers, replacing outdated meters. These new controllers were supported by innovative portal software that notified users of potential leaks. Additionally, around 17,500 pressurized irrigation meters were set to be reprogrammed to ensure compatibility with this new system. The project, with an overall cost of \$692,000, received a 277,000 grant from the Bureau of Reclamation. Furthermore, a \$300,000 grant was awarded to the WBWCD—the state’s most extensive system for secondary water metering. This grant aimed to extend metering services to the communities of Bountiful and Woods Cross in southern Davis County, significantly improving water conservation and management in the area. In other states, such as Colorado and California, statewide water plans have grants associated with each plan’s mission (Table 26). The Colorado and California plans consist of targeted conservation efforts, which include reducing outdoor water use on irrigated grass. These grant applications are available to municipalities and local authorities and provide funding that would be redistributed for residential and industrial scale grass replacement.

4.2.3.1.2 Financing Incentives

Many state water funding entities require municipalities to submit water conservation plans to qualify for certain state funding programs, including revolving loan funds. These plans often include the adoption of water conservation ordinances as a key component (UDWR 2024b). Conservation plan requirements could be enhanced by requiring enactment of municipal ordinances or other programs to reduce nonfunctional grass lawns to qualify for state water funding.

In Utah, every 5 years, each water conservancy district and public water systems with over 500 connections must submit a water conservation plan to the UDWR to comply with the Water Conservation Act (UDWR 2024b). These plans contain existing and proposed water conservation measures, which outline how the entity and the end culinary water user will conserve water, limit or reduce per capita consumption, ensure adequate water supplies are available for future needs, and meet regional water conservation goals. The UDWR reviews these plans and provides assistance as systems work to improve water efficiency. Systems that do not submit a water conservation plan every 5 years are considered non-compliant and are ineligible for state loans or funding (UDWR 2024b).

Municipalities also often rely on the Clean Water State Revolving Fund and the Drinking Water State Revolving Fund to finance large wastewater, stormwater, and drinking water infrastructure projects. For municipalities to receive state funding support from the Water Quality Board, they also need to be in good standing with UDWR compliance regarding a water conservation plan (Davies 2024). In addition, both the Clean Water State Revolving Fund and the Drinking Water State Revolving Fund can support water conservation projects directly through low-interest loans for the planning, design, and implementation of water conservation projects.

The Texas Water Development Board requires submittal of a water conservation plan for entities applying to receive financial assistance greater than \$500,000, have 3,300 connections, or have a surface water right (Texas Water Development Board 2022).

Table 26. Grants Offered in California, Colorado, and Florida That Fund Conservation Incentives

Agency/Entity	Description	Program Type	Link
California Department of Water Resources	The Integrated Regional Water Management (IRWM) program, led by the California Department of Water Resources, is a collaborative effort to address water resource challenges at the regional level across California. This program brings together diverse stakeholders, including local governments, water agencies, tribes, environmental organizations, and community groups to develop and implement comprehensive water management strategies tailored to the unique needs and conditions of each region. Through the IRWM program, participants work collaboratively to identify water resource priorities, assess vulnerabilities, and develop integrated solutions that enhance water supply reliability, protect water quality, and promote environmental stewardship. Key components of the program include watershed planning, water conservation and efficiency measures, groundwater management, stormwater capture and reuse, ecosystem restoration, and climate change adaptation strategies. Funding provided through the IRWM program supports the implementation of projects that advance these objectives, with an emphasis on projects that demonstrate collaboration, integration, and innovation. By fostering partnerships and coordination among stakeholders, the IRWM program aims to build resilience, improve water management practices, and ensure water security for communities throughout California.	Integrated Regional Water Management Program	https://water.ca.gov/programs/integrated-regional-water-management
Colorado Water Conservation Board (CWCB)	The Colorado Water Plan Grants, administered by the CWCB, are designed to support projects that align with the goals and objectives outlined in the Colorado Water Plan. These grants provide financial assistance to local governments, water utilities, nonprofit organizations, and other eligible entities in Colorado for the planning, design, implementation, and management of water-related projects. The grants focus on addressing the state's water challenges, including water supply and demand imbalances, environmental conservation, agricultural sustainability, and resilience to climate change impacts. Projects funded through these grants may include water infrastructure improvements, water conservation and efficiency initiatives, watershed management projects, stream restoration efforts, and water education and outreach programs. The Water Plan Grants aim to advance the objectives outlined in the Colorado Water Plan, promote collaboration among stakeholders, and support the sustainable management and conservation of Colorado's water resources for the benefit of present and future generations.	Water Plan Grants	https://cwcb.colorado.gov/funding/colorado-water-plan-grants

Agency/Entity	Description	Program Type	Link
Florida Department of Environmental Protection	The Alternative Water Supply Grants, offered by the Florida Department of Environmental Protection (FDEP), aim to support projects that enhance the state's water resources through the development and implementation of alternative water supply (AWS) projects. These grants provide financial assistance to local governments, water utilities, and other eligible entities in Florida for the planning, design, construction, and implementation of AWS projects. Alternative water supply projects include initiatives, such as water reuse, desalination, aquifer storage and recovery, and stormwater harvesting, among others. The grants aim to promote water resource sustainability, increase water supply reliability, and reduce the demand on traditional freshwater sources by encouraging the development and utilization of innovative water supply solutions. By funding these projects, the FDEP aims to address water supply challenges, support economic development, and enhance environmental protection efforts across the state of Florida.	Alternative Water Supply Grants	https://floridadep.gov/owper/water-policy/content/alternative-water-supply-grants

4.2.3.2 TECHNICAL ASSISTANCE

4.2.3.2.1 Programs in Utah

The UDWR requires water conservation plans that ensure water supplies are available to meet regional water conservation goals, which are outlined in *Utah's Regional M&I Water Conservation Goals Report* (Hansen, Allen & Luce and Bowen Collins & Associates 2019). The UDWR, in collaboration with USU, offers technical assistance through the Utah Growing Water Smart Workshops to support municipalities as they develop and integrate water considerations into land planning to reduce M&I water use (USU 2023).

4.2.3.2.2 Comparison to Other States

Similar efforts in California provide technical assistance directly to municipalities in their conservation planning (California Department of Water Resources 2024). Specifically, California's Department of Water Resources lists the specific land use planning support tools related to water conservation, which provide the following types of support: land use surveys, water balance studies, a mobile irrigation management lab, assistance with urban and agricultural water management plans, leak detection services, water transfers analysis, and crop land idling verification. Additionally, in Colorado, the Colorado Department of Natural Resources has developed the Colorado Water Conservation Board (CWCB), which offers guidance, resources, and tools to help municipalities create effective water conservation policies. The CWCB offers specific funding to support technical assistance related to the implementation of the Colorado Water Plan, which can include specific allocation of funds to support the implementation of water conservation tools (CWCB 2024).

4.3 Implementing Landscape Conversion Incentives

Landscape conversion incentive programs, such as rebates, face several challenges that can hinder their widespread adoption. One of the primary obstacles is the initial cost of converting traditional lawns to water-efficient landscapes. Despite the long-term savings in water bills and maintenance costs, the upfront investment required for landscaping materials, plants, and labor can be a significant deterrent for some property owners. Additionally, aesthetic preferences and concerns about property values can lead to resistance among homeowners who favor the traditional appearance of lush, green lawns over drought-tolerant landscaping options. The JWCD has identified another critical challenge: funding for landscape conversion programs is often allocated specifically for rebates and incentives without considering the necessary support for staff or marketing efforts to effectively reach potential participants (Brown 2024). This gap can limit program visibility and accessibility, reducing its overall impact.

To create a more robust and effective landscape conversion incentive program, several strategies can be implemented. Offering free or discounted landscaping materials directly addresses the issue of high initial conversion costs, making it financially easier for property owners to participate in the program. By reducing the cost barrier, these incentives can encourage more homeowners and businesses to consider making the transition to water-efficient landscapes.

Expanding the accessibility and impact of landscape conversion incentive programs necessitates not only addressing the initial cost barriers but also ensuring that these programs are equitable and reach all segments of the community. As highlighted in Section 4.2.2, an inclusive approach, such as Colorado's Aurora Water program that offers income-qualified residents (incomes below 60% of the median) a free water-wise landscape replacement, significantly increases the accessibility of conservation efforts, making water-wise landscaping an achievable goal for a broader demographic. Incorporating similar income-qualified components into landscape conversion programs in Utah could significantly enhance

their effectiveness and reach. These initiatives ensure that water conservation efforts are not just limited to those who can afford the initial investment but are extended to include communities that stand to benefit the most from reduced water bills and maintenance costs.

Additionally, providing municipalities with additional funding and technical assistance can significantly enhance the reach and effectiveness of landscape conversion programs as outlined in Section 4.2.3. This support can enable local governments to invest in targeted marketing campaigns, educational workshops, and personalized landscaping consultations, helping to raise awareness about the benefits of water-efficient landscapes and address common misconceptions about their appearance and impact on property values.

Although landscape conversion incentive programs face challenges related to cost, aesthetics, and program visibility, adopting a multifaceted approach that includes offering free or discounted materials, provides additional support to municipalities, and emphasizes continuous education can significantly enhance the effectiveness of these initiatives. By addressing the concerns and barriers faced by property owners, these incentive programs can promote wider adoption of water-efficient landscaping practices.

Table 27 provides a list of resources that provide guidance on transitioning to water-wise landscaping, which municipalities can use within their landscape conversion incentive programs.

Table 27. Available Resources for Landscape Conversion Programs

Resource Name	Description	Author	Link
Utah Growing Water Smart <i>The Water-Land Use Integration Guidebook</i>	<i>The Water-Land Use Integration Guidebook</i> informs grass replacement rebate programs by integrating water management with land use planning, ensuring a comprehensive approach to water conservation. It emphasizes data-driven decision-making to target high-priority areas and community involvement to enhance program uptake and effectiveness. The guidebook also recommends offering financial and technical assistance, including design services and installation guidance, and aligns rebate initiatives with broader sustainability goals and economic benefits. This holistic strategy ensures long-term success and sustainability of water conservation efforts.	Kelly Kopp and Joanna Endter-Wada, USU's Center for Water-Efficient Landscaping	https://digitalcommons.usu.edu/cgi/viewcontent.cgi?article=1001&context=cwel_water_smart
Weekly Lawn Watering Guide	The UDWR provides Weekly Lawn Watering Guides tailored to specific areas and types of lawns, using statewide weather data to update recommendations weekly in response to changing weather conditions.	UDWR	https://conservewater.utah.gov/weekly-lawn-watering-guide/
Principles of Water-Wise Landscaping	USU's Center for Water-Efficient Landscaping provides in depth information on planning, designing, and maintaining a water-efficient landscape.	USU Center for Water-Efficient Landscaping	https://extension.usu.edu/cwel/principles
Utah Growing Smart Workshops	Using a Utah-focused curriculum developed by Dr. Joanna Endter-Wada and Dr. Kelly Kopp of the Center for Water-Efficient Landscaping at USU, these facilitated workshops provide collaborative opportunities, policy tools, technical resources, and technical assistance for participating communities seeking to strengthen their water security in the face of extended drought, climate change, and growing populations and economies. Teams develop action plans on behalf of their communities and commit to post-workshop activities to advance those plans. Funding for these workshops has come through a combination of funds from legislature, Utah water districts, and USU.	USU Utah Growing Water Smart Center for Water-Efficient Landscaping	https://extension.usu.edu/cwel/utah-growing-water-smart/workshops https://water.utah.gov/integrated-water-land-planning/
Localscapes	Localscapes is a series of landscaping patterns and practices, which account for Utah's unique climate. They offer classes and free designs on their interactive website.	Localscapes	https://localscapes.com/localscapesresources
Garden Wise in Salt Lake City	Salt Lake Public Utilities has developed a website, which provides water-wise landscape tours, helpful plant and watering guides, and information about weed control.	Salt Lake Public Utilities	https://www.slcgardenwise.com/
Conservation Garden Park Water-wise Plants	Directory for water-wise plants in Utah.	JVWCD	https://conservationgardenpark.org/plants
Sego Lily Gardens	Sego Lily Gardens is an educational garden designed for the public to observe and learn how to use water conservation principles and practices to create a beautiful and water-wise landscape.	Sandy Public Utilities	https://sandy.utah.gov/1334/Sego-Lily-Gardens
Plants in the Garden	Directory for water-wise plants in Utah.	Weber Basin Conservancy District	https://weberbasin.gov/Conservation/PlantInfo
Water-wise Plant List	The UDWR developed an application that allows property owners to enter their address, identify the U.S. Department of Agriculture Plant Hardiness Zone they live in, and view a list of water-wise plants that are well suited to their area that require minimal watering.	UDWR	https://water.utah.gov/water-wise-plants/

5 CONCLUSION

Efforts to conserve water and safeguard the GSL have gained significant public support since the lake reached its historic low lake level in 2022. This has resulted in legislative progress to incentivize water conservation and develop strategies to deliver more water to the lake. However, as these tools are implemented, it is imperative that all water users in the GSL Basin commit to water conservation practices. For municipalities, this requires the adoption of aggressive water conservation ordinances, incentives and rebate programs, and conservation-focused water rate structures. These measures are essential for conserving existing water supplies and ensuring the continued and increased delivery of water to the GSL.

In well-established communities, incentive and rebate programs, along with thoughtfully structured water rates, are the most effective strategies for shifting water usage behaviors of individual homeowners and businesses. By making the initial transition to water-efficient landscaping and fixtures more financially accessible, these programs not only promote but also economically justify water conservation efforts. In cities expected to continue to grow, the introduction of ordinances and structured water rate schedules is crucial. These measures not only set standards for responsible water use from the outset but also cultivate a lasting culture of conservation. This proactive approach is vital in ensuring that all communities—regardless of their stage of development—contribute to the overarching goal of living within our existing water supplies and maintaining essential flows to the GSL.

The significance of water conservation in Utah cannot be overstated, particularly with regard to the GSL's well-being. The lake's unique ecosystems are indispensable, providing critical habitat for a diverse range of wildlife and playing a significant role in the regional climate by influencing precipitation patterns throughout the year. The conservation tools discussed here offer a comprehensive and adaptable suite of strategies tailored to meet the needs of diverse Utah communities. Although each community in Utah has its own unique characteristics and challenges, the common thread binding them is the necessity to protect the GSL. This is not just for the sake of the lake itself but also to support Utah's agriculture, wildlife, industries, and well-being of its people.

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APPENDIX A

Model Outdoor Ordinance

CITY NAME, UTAH
ORDINANCE ###

ORDINANCE SHORT TITLE

An ordinance of (county/city) to (amend/establish) citywide water efficiency landscaping standards and adoption requirements for water-saving systems and technologies used for landscape irrigation.

Ordaining Clause

WHEREAS, water is an increasingly scarce resource, of limited supply, and subject to increasing demand;

WHEREAS it is the policy of (governing body) of (county/city) to promote the efficient use of water and prevent water waste;

WHEREAS the (governing body) of (county/city) has the responsibility under Utah Code Annotated § 10-9-403(2)(iv) to regulate the consumptive use of water;

WHEREAS the (governing body) of (county/city) has the authority to adopt this ordinance pursuant to Utah Code Annotated § 10-3-702 and hereby exercises its legislative powers in doing so;

WHEREAS (governing body) desires to promote the design, installation, and maintenance of landscapes that are both attractive and water efficient;

WHEREAS the (governing body) of (county/city) desires to adopt the ordinance, including variance and enforcement procedures; and

WHEREAS the (governing body) of (county/city) declares that the adoption of this ordinance is in the public interest of this community.

Be it ordained by the (governing body) of (county/city) (Section __). (Sections __ through __,) are created to read:

ORDINANCE FULL TITLE

Section 1. INTENT AND PURPOSE

It is the intent and purpose of this ordinance to establish landscaping and landscape irrigation standards that promote water conservation through the citywide adoption of landscaping that includes drought-resistant and low-water-use plants, the removal of nonfunctional grass lawn, the irrigation schedules, and requirements for efficient irrigation technology where warranted.

Section 2. DEFINITIONS

For the purpose of this ordinance, the following terms, phrases, words, and their derivatives shall have the meanings listed below. When consistent with the context, words used in the present tense include the future, words in the plural include the singular, and words in the singular include the plural.

1. "Address" means the house number (a numeric or alphanumeric designation) that, together with the street name, describes the physical location of a specific property. This includes rural route numbers but excludes post office box numbers. If a lot number in a mobile home park or similar community is used by the U.S. Postal Service to determine a delivery location, the lot number shall be the property's address. If a lot number in a mobile home park or similar residential community is not used by the U.S. Postal Service (e.g., the park manager sorts incoming mail delivered to the community's address), then the community's main address shall be the property's address. If a property has no address, it shall be considered "even numbered."
2. "Commercial development/property" ([Municipality to define](#))
3. "Development" means any parcel that has been altered from its natural conditions through grading; filling; overlaying; or the construction of improvements, features, landscaping, or other impervious surfaces.
4. "Drip emitter" means a "drip irrigation system" outlet through which water exits the system onto landscaped ground.
5. "Drip Irrigation System" means a system of narrow distribution tubes and/or pipes that deliver water from a dedicated low-pressure supply valve to individual plants and trees through drip emitters. Drip emitters do not include microspray, fogger, or bubbler emitters.
6. "Even-numbered address" means an address ending in the number 0, 2, 4, 6, or 8 or the letters A through M or rights-of-way or other locations with no address.
7. "Existing Development" means development approved by ([governing body](#)) of ([city/county](#)) to begin before the adoption of this ordinance, regardless of whether the project has been completed.
8. "Homeowner's association (HOA)" means an organization that makes and enforces rules and guidelines for a subdivision, planned community, or condominium building.
9. "Infiltration" means the process by which water on the ground surface enters the soil.

10. “Inline drip emitter” means a drip emitter system with emitters set at varying intervals across the length of an irrigation hose.
11. “Institutional Development/Property” ([Municipality to define](#))
12. “Irrigation controller” means any device capable of being programmed to deliver water based on schedule.
13. “Landscape Zone” means a portion of the landscaped area featuring plants with similar water needs, areas with similar “microclimate” (i.e., slope, exposure, wind, etc.) and soil conditions, and areas that will be similarly irrigated. A landscape zone can be served by one irrigation valve or a set of valves on the same schedule.
14. “Landscaped Area” means any area of non-agricultural land featuring any combination of living plants, such as trees, shrubs, vines, ground cover, flowers, and grass; natural features, such as rock, stone, and bark chips; and structural features, including fountains, reflecting pools, outdoor artwork, screen walls, fences, and benches.
15. “Landscaping” means any combination of living plants, such as trees, shrubs, vines, ground cover, flowers, and grass; natural features, such as rock, stone, and bark chips; and structural features, including fountains, reflecting pools, outdoor artwork, screen walls, fences, and benches.
16. “Law Enforcement Official” means an individual or agency with authority to enforce criminal statutes or ordinances of this state or a political subdivision of the state.
17. “Microclimate” means the climate of an area that is different from the surrounding area. These areas include shade areas, sun areas, and areas protected by surrounding structures.
18. “Mulch” means material such as rock, bark, wood chips, or other materials left loose and applied to the soil.
19. “New Development” means development resulting from the conversion of previously undeveloped land or agricultural land.
20. “New landscaping” means any landscaping that has been in place for forty-five (45) days or less.
21. “Non-porous” means not permeable to water, air, or other fluids.

22. “Odd-numbered address” means an address ending in the number 1, 3, 5, 7, or 9 or the letters N through Z.
23. “Overhead spray irrigation” means aboveground irrigation heads that spray water through a nozzle.
24. “Park Strip” means a (typically) narrow landscaped area between the back-of-curb and sidewalk.
25. “Point source drip emitter” means a drip emitter system featuring individual distribution lines and emitters that are placed at the base of each plant or tree.
26. “Provision” means a clause in a legal instrument, a law, ordinance, etc.
27. “Public Entity” means the state or any political subdivision of it or any office, department, division, board, agency, commission, council, authority, institution, hospital, school, college, university, or other instrumentality of the
28. “Public Entity Property” means real or personal property that is owned, held, or managed by a public entity.
29. “Redevelopment” means the repair, renovation, remodeling, alteration, enlargement, rehabilitation, or reconstruction of a building or changing the character or use of a building in a manner that alters the occupancy loads, other demands, or safety risks of the building or any change to landscaped areas of a property altering 50% or of the total landscaped area.
30. “Residential Development/Property” ([Municipality to define](#))
31. “Rotary head” means a nozzle for a spray sprinkler system capable of rotating at least 90 degrees while delivering water.
32. “Secondary Water” means untreated, unfiltered water that is used for irrigation of landscaping. This water is non-potable (not suitable for human consumption) and is to be used only for outdoor irrigation.
33. “Smart Irrigation Controller” means an automatic timing device used to remotely control valves in an irrigation system via the internet to correspond with real-time weather source or soil-moisture sensor.
34. “Soil amendment” means any material added to the soil to improve its physical or chemical properties.
35. “Topsoil” means the top layer of soil (i.e., the first 2 to 8 inches in depth).

36. “Grass lawn” means nonagricultural land planted with closely mowed, managed grasses and includes lawn and turf grass. This excludes golf courses, active recreation areas, athletic fields.
37. “User” means a person or entity that contracts with a water provider to obtain water for residential, commercial, industrial, or institutional use.
38. “Wasteful and Unnecessary” means allowing water to be dispersed without any practical purpose for the water use; examples include excessive landscape irrigation; leaving water flowing through an unattended hose on a driveway; allowing water to be dispersed in a grossly inefficient manner regardless of the type of water use (e.g., allowing landscape irrigation water to unnecessarily fall onto pavement, sidewalks, and other impervious surfaces); and allowing water to flow through a broken or malfunctioning water delivery or landscape irrigation system.
39. “Water meter” means an instrument capable of recording the quantity of water passing through a particular outlet.
40. “Water Provider” means any entity responsible for the management and delivery of water resources for human consumption and other domestic use through a system that
 - a. has 15 or more connections and/or
 - b. serves 25 or more people for 60 days of the year.
41. “Water Resource” means any water, including culinary or secondary water, delivered to a user by a water provider.
42. “Water Shortage” means the conditions under which the ([governing body](#)) of ([city/county](#)) or a higher authority, such as the Utah State Government, determines that there may not be enough water available to meet the present and anticipated needs of the users or the conditions require a temporary reduction in total use within a particular area to protect water resources from serious harm. A water shortage usually occurs due to drought.
43. Water-Conserving Plant means a plant that, once established, can generally survive with available rainfall but may require supplemental irrigation during spring and summer, synonymous with drought tolerant species.
44. “Non-functional grass lawn” is grass that is purely ornamental and not used for human recreation. It can include grass that is irrigated with potable water but is not walked on, played on, or used in any meaningful way. Non-functional grass lawn does not include areas that are regularly used for civic or community events, such as parks and school fields.

45. “Planting Bed” is a defined area of soil that is used for planting and growing plants.

Section 3. APPLICABILITY

The provisions defined by all sections in this ordinance shall apply to all users; existing, new, redeveloped, redesigned, and/or rehabilitated landscaping for public agency projects or projects occurring on public entity property; private, commercial, and industrial development projects; developer-installed landscaping in multi-family and single-family residential projects; and homeowner-provided landscape improvements within the front, side, and rear yards of single- and two-family dwellings using water from water supplies managed or distributed by water retailers servicing users or properties within (city/county). The provisions of this ordinance apply to each user, as defined in Section 2(37), within the jurisdictional boundaries of (city/county), with the following exceptions.

- a) Sections 4, 6, 7, and 8 do not apply to existing developments, as defined in section 2(7), though it is recommended that owners of existing developments incorporate and adopt the requirements for new and redeveloped properties, as defined in this ordinance.
- b) [Exception 2](#)

Section 4. LANDSCAPING DESIGN AND MATERIALS REQUIREMENTS FOR NEW DEVELOPMENTS AND REDEVELOPMENTS

1. The planting of grass lawns shall be limited to the following:
 - a. No more than 35% of the front and side yards of landscaped area, except where a residential lot is less than 250 square feet;
 - b. Landscaped areas more than 8 feet wide.
 - c. The 35% grass allowance is capped at large lots greater than 1,500 square feet; 0% is allowed for the remainder of the lot.
2. Plant Selection
 - a. Plants selected for planting beds, as defined in Section 2 (45), shall be planted with water-conserving plants. Planting beds shall not be planted with ground-cover species or a mass of vegetation requiring overhead spray irrigation.¹
3. Upon the completion of planting, all irrigated, non-grass, landscaped areas shall be covered with a layer of mulch at least 3 inches deep.
4. It is recommended that, at maturity, at least 50% of a landscaped area is vegetated at ground level, not including tree canopy.

¹ A list of drought tolerant plant species can be found on Utah State University’s Center for Water Efficient Landscaping Website

Section 5. LANDSCAPE IRRIGATION SCHEDULE

1. The year-round landscape irrigation conservation measures and requirements contained in this ordinance are applicable to all users, except those using water for the irrigation of agricultural land, as defined by Utah Code Annotated § 59-2-503. These conservation measures apply to all water resources, unless otherwise indicated.
2. It shall be the duty of each user to stay informed on the landscape irrigation requirements and conservation measures in this ordinance that affect each water user.
3. In addition to the specific measures and provisions in this ordinance, all uses that are wasteful and unnecessary, as defined in section 2(38), are prohibited.
4. The following requirements shall apply to all water users, unless otherwise stated.
 - a. Landscape irrigation shall be prohibited between the hours of 8:00 a.m. and 8:00 p.m., Mountain Standard Time (UTC-07:00), except as otherwise stated.
 - b. Irrigation of existing landscaping shall comply with the following provisions:
 - i. Irrigation allowed up two (2) days a week during July and August or in case of a declared water shortage by ([governing body](#)) of ([city/county](#)) or a higher authority.
 - ii. Users, regardless of address, may irrigate landscaped areas an additional third (3rd) day of each week between June 1 and October 31 when temperatures exceed 90 degrees Fahrenheit for a period of more than 4 hours in a single daylight cycle.
 - c. Irrigation of newly planted landscaping shall comply with the following provisions:
 - i. An establishment period of forty-five (45) days begins on the day the new landscaping is installed. The new landscaping shall be installed within a reasonable amount of time from the date of purchase, which may be demonstrated with a dated receipt or invoice.
 - ii. Irrigation Frequency:
 1. New landscaping may be irrigated once on the day it is installed without regard to the listed watering days and times.
 2. Irrigation of new landscaping that has been in place for forty-five (45) or fewer days may take place three times during each weeklong period during the forty-five (45) day establishment period.
 3. Irrigation of the soil immediately prior to the installation of the new landscaping is allowed without regard to the listed watering days and times.
 - iii. Irrigation of new landscaping is limited to areas containing only the new landscaping. An entire zone of an irrigation system, either spray or drip, shall be used only for landscape irrigation under this subsection if at least 50% of the zone contains new landscaping. If less than 50% of a zone contains new landscaping, or if the new landscaping is in an area that will not typically be irrigated by an irrigation system, only the individual new

plantings are eligible for additional irrigation. Targeted watering may take place via low-volume hand watering or any method that isolates and waters only the new landscaping.

5. Any water shortage, as defined in Section 2(42), restrictions, or other measures declared or related orders that are more restrictive than a measure contained within this ordinance shall supersede this ordinance for the duration of the applicable declaration.

Section 6. LANDSCAPE IRRIGATION TECHNOLOGY AND DESIGN REQUIREMENTS FOR NEW DEVELOPMENTS AND REDEVELOPMENTS

1. Irrigation systems for new and redeveloped landscaped areas shall feature an irrigation controller capable of delivering water on a programmed schedule based on the time of day. Users should, whenever possible halt or pause irrigation during precipitation events.
2. Landscaped areas on new developments or redeveloped properties shall be equipped with drip irrigation systems that are either point-source or inline systems to irrigate non-grass vegetation.
 - a. Each irrigation valve shall irrigate a landscaped area with similar conditions and vegetation with similar water needs.
 - b. Spray and drip irrigation systems shall be placed on separate valves.
 - c. Drip emitters shall be provided for each tree within a landscaped area.
 - d. Drip emitters shall be limited to a flow rate of 5 gallons per hour.
 - e. Drip emitters shall be fitted with a pressure regulator, filter, flush-end assembly, and any other components necessary to prevent water waste.
 - f. It is recommended that users program valves to irrigate in cycles to avoid evaporation and runoff when irrigating vegetation on slopes or in areas in which soils prevent rapid infiltration, such as clay-dominant soils.
3. Landscaped areas on new developments or redeveloped properties comprised of grass lawn shall use the following irrigation technology.
 - a. Spray head sprinklers shall include rotary nozzles, except when rotary nozzles may lead to water waste or contribute to the potential contamination of a water resource.
4. Any grass lawn that grows to the extent that it blocks or inhibits a spray head sprinkler's distribution of water shall be cut down to the longest length that allows for the successful operation of spray irrigation without impediment. Irrigation systems using secondary water shall adhere to the following:
 - a. Filters shall be required on all secondary water service connections.
 - i. Filters shall have, at a minimum, a 30-mesh screen.
 - ii. Filters shall be cleaned and maintained by the property owner according to manufacturer recommendations.
 - b. All systems using secondary water must feature a water meter approved by the local governing body.

[1. Municipality to determine meter installation requirements.](#)

Section 7. ADDITIONAL REQUIREMENTS AND RESTRICTIONS FOR NEW AND REDEVELOPED COMMERCIAL, INDUSTRIAL, AND MULTI-FAMILY RESIDENTIAL PROPERTIES

1. Except where otherwise stated, commercial, industrial, and multi-family developments shall adhere to the landscape material and design requirements, irrigation schedule, and irrigation technology requirements outlined in Sections 4, 5, and 6 of this ordinance.
2. Grass lawn may account for no more than 20% of total landscaped area, not including active recreation zones.

Section 8. ADDITIONAL REQUIREMENTS AND RESTRICTIONS FOR PUBLIC ENTITY PROPERTIES

1. Except where otherwise stated, in accordance with Utah Code, public entity properties shall adhere to the landscape materials and design requirements, irrigation schedule, and irrigation technology requirements outlined in Sections 4, 5, and 6 of this ordinance.
2. In accordance with Utah Code Annotated § 11-39-108, 53G-7-224, and 72-7-111, new public entity developments within the Great Salt Lake Basin may not include the installation, maintenance, or use of overhead sprinkler systems to irrigate landscaped areas
 - a. on public entity properties outside active recreation zones,
 - b. a park strip, or
 - c. in areas narrower than 8 feet.
3. Grass lawn may account for no more than 20% of total landscaped area, not including active recreation zones.
4. Public entities within the Great Salt Lake Basin starting construction on their properties after May 1, 2024, may not install, maintain, or use spray irrigation in a landscaped area of the properties outside active recreation areas and may not treat the properties as active recreation zones if the area is larger than reasonably required for the anticipated use.

Section 9. ADDITIONAL REQUIREMENTS AND RESTRICTIONS FOR HOMEOWNERS ASSOCIATION DEVELOPMENTS

1. Except where otherwise stated all Homeowners Association developments shall adhere to the landscape material and design requirements, irrigation schedule, and irrigation technology requirements outlined in Sections 4, 5, and 6 of this ordinance.
2. Any Homeowners Association governing documents that govern the interests of a common interest development are void if they,
 - a. require the use of any continuous or uniform non-grass plants that require spray irrigation,
 - b. require spray irrigation on landscaped areas 8 feet wide or narrower,
 - c. prohibit or restrict the use of water-conserving plants as a group, and/or
 - d. have the effect of prohibiting, restricting, or contradicting the requirements of this ordinance or another water conservation ordinance.

Section 10. OBLIGATION TO FIX LEAKS, BREAKS, AND MALFUNCTIONS

1. The property owner shall repair any damaged, defective, or malfunctioning component of the property that has resulted in leaking of water within 15 days of discovering the leak.

Section 11. WASHING OF PAVED OR IMPERVIOUS SURFACES

1. Users shall not use water resources to clean, wash, or rinse paved, hardened, or otherwise impervious surfaces except
 - a. when mechanical means of cleaning a surface, such as sweeping, scrubbing, mopping, or using a leaf blower or other portable equipment as part of any landscape maintenance, construction, property repair, or property maintenance for the purpose of blowing, dispersing, or redistributing dust, dirt, leaves, grass, clippings, cuttings or other materials, is insufficient to address the issue, or
 - b. when local, state, or federal law requires the use of water resources to clean up a specific material or materials that have spilled.
2. When necessary, users using water resources to clean impervious surfaces shall do so in accordance with local, state, and federal laws mandating the use of water for cleaning the specific materials on-site.

Section 12. PROHIBITION OF EXCESS WATER FLOW OR RUNOFF

1. All users are prohibited from using water resources in a way that is deemed wasteful and unnecessary, as defined in section 2(38) of this ordinance.

Section 13. VARIANCES

1. A variance from adherence to the provisions in Sections 4 through Section 12 may be granted by the (governing body) of (county/city) if strict application of the measures identified in this ordinance will lead to an unreasonable or unfair result with substantial impact to the user's economic status, health, or creates any other hardship(s) on the user or those served by the user. Provided the applicant demonstrates to the (governing body) of (county/city) that compliance with one or more provisions of this ordinance a variance may be granted only upon a demonstration that such hardship exists and is not self-imposed. If a variance is granted, the user shall be required to post a notice at each physical address to which the variance pertains.

Section 14. ENFORCEMENT

1. The listed provisions of this ordinance shall be subject to enforcement action.
2. The (governing body) of (county/city) authorizes law enforcement officials, as defined in section 2(16) to enforce the provisions of this ordinance.

Section 15. PENALTIES

1. (Governing body) may impose a criminal penalty for violations of the provisions of this ordinance. Penalties for individuals, or other entities to be determined by municipality.

2. Each day in violation of this Ordinance shall constitute a separate offense. Law enforcement officials may provide violators with no more than one (1) written warning.

Section 16. EFFECTIVE DATE

This ordinance shall take effect immediately upon its adoption.

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APPENDIX B

Model Indoor Ordinance

CITY NAME, UTAH
ORDINANCE ###

ORDINANCE SHORT TITLE

An ordinance of (county/city) to (amend/establish) citywide water efficiency standards and adoption requirements for water-saving systems and technologies in residential and commercial buildings to conserve water and reduce water usage.

Ordaining Clause

WHEREAS water is an increasingly scarce resource, of limited supply, and subject to increasing demand;

WHEREAS it is the policy of (governing body) of (county/city) to promote the efficient use of water and prevent water waste;

WHEREAS the (governing body) of (county/city) has the responsibility under Utah Code Annotated § 10-9-403(2)(iv) to regulate the consumptive use of water;

WHEREAS the (governing body) of (county/city) has the authority to adopt this ordinance pursuant to Utah Code Annotated § 10-3-702 and hereby exercises its legislative powers in doing so;

WHEREAS (governing body) desires to promote the design, installation, and maintenance of landscapes that are both attractive and water efficient;

WHEREAS the (governing body) of (county/city) desires to adopt the ordinance; including variance and enforcement procedures and;

WHEREAS the (governing body) or (county/city) declares that the adoption of this ordinance is in the public interest of this community.

Be it ordained by the (governing body) of (county/city) (Section __). (Sections__ through __,) are created to read:

ORDINANCE FULL TITLE

Section 1. INTENT AND PURPOSE

It is the intent and purpose of this ordinance to promote water conservation through the citywide adoption of high-efficiency and ultra-high efficiency water fixtures and appliances.

Section 2. DEFINITIONS

For the purpose of this ordinance, the following terms, phrases, words, and their derivatives shall have the meanings listed below. When consistent with the context, words used in the present tense include the future, words in the plural include the singular, and words in the singular include the plural.

1. “Address” means the house number (a numeric or alphanumeric designation) that, together with the street name, describes the physical location of a specific property. This includes rural route numbers but excludes post office box numbers. If a lot number in a mobile home park or similar community is used by the U.S. Postal Service to determine a delivery location, the lot number shall be the property’s address. If a lot number in a mobile home park or similar residential community is not used by the U.S. Postal Service (e.g., the park manager sorts incoming mail delivered to the community’s address), then the community’s main address shall be the property’s address. If a property has no address, it shall be considered “even numbered.”
2. “Commercial development/property” ([Municipality to define](#))
3. "Development" means any parcel that has been altered from its natural conditions through grading; filling; overlaying; or the construction of improvements, features, landscaping, or other impervious surfaces.
4. “Even-numbered address” means an address ending in the number 0, 2, 4, 6, or 8 or the letters A through M or rights-of-way or other locations with no address.
5. “Existing development” means development approved by ([governing body](#)) of ([city/county](#)) to begin before the adoption of this ordinance, regardless of whether the project has been completed.
6. "Faucet" means a device by which water is delivered from a pipe and can be controlled that is installed in a bathroom, “lavatory”, or restroom.
7. “Fixtures” means a piece of equipment, permanently or semi-permanently affixed to a building with the capability to distribute, store, or consume water delivered to a property by a water provider.
 - a. As used in this ordinance, “plumbing fixtures” shall be synonymous with “fixtures” unless otherwise stated.
8. “Homeowner’s association (HOA)” means an organization that makes and enforces rules and guidelines for a subdivision, planned community, or condominium building.
9. “Institutional development/property” ([Municipality to define](#))
10. “Lavatory” means a room or compartment with a wash basin.
11. “Law Enforcement Official” means an individual or agency with authority to enforce criminal statutes or ordinances of this state or a political subdivision of the state.

12. “New development” means development resulting from the conversion of previously undeveloped land or agricultural land.
13. “Odd-numbered address” means an address ending in the number 1, 3, 5, 7, or 9 or the letters N through Z.
14. “Provision” means a clause in a legal instrument, a law, ordinance, etc.
15. “Public Entity” means the state or any political subdivision of it or any office, department, division, board, agency, commission, council, authority, institution, hospital, school, college, university, or other instrumentality of the state.
16. “Public Entity Property” means real or personal property that is owned, held, or managed by a public entity.
17. “Redevelopment” means the repair, renovation, remodeling, alteration, enlargement, rehabilitation, or reconstruction of a building or changing the character or use of a building in a manner that alters the occupancy loads, other demands, or safety risks of the building or any change to landscaped areas of a property altering 50% or more of the total landscaped area.
18. “Residential development/property” ([Municipality to define](#))
19. “Secondary Water” means untreated, unfiltered water that is used for irrigation of landscaping. This water is non-potable (not suitable for human consumption) and is to be used only for outdoor irrigation.
20. “Shower head” means a perforated nozzle that distributes water for the purpose of bathing.
21. “Toilet” means a fixed receptacle into which a person may urinate or defecate, consisting of a large bowl connected to a sewer or septic system. This includes toilets that feature a tank or valve type design.
22. “Urinal” means a receptacle, typically mounted to a wall in public restrooms, into which a person may urinate.
23. “User” means a person or entity that contracts with a water provider to obtain water for residential, commercial, industrial, or institutional use.
24. “Wasteful and Unnecessary” means allowing water to be dispersed without any practical purpose for the water use; examples include excessive landscape irrigation; leaving water flowing through an unattended hose on a driveway; allowing water to be dispersed in a grossly inefficient manner regardless of the type of water use (e.g., allowing landscape irrigation water to unnecessarily fall onto pavement, sidewalks, and other impervious surfaces); and allowing water to

flow through a broken or malfunctioning water delivery or landscape irrigation system.

25. “Water meter” means an instrument capable of recording the quantity of water passing through a particular outlet.
26. “Water Provider” means any entity responsible for the management and delivery of water resources for human consumption and other domestic use through a system that
 - a. has 15 or more connections and/or
 - b. serves 25 or more people for 60 days of the year.
27. “Water Resource” means any water, including culinary or secondary water, delivered to a user by a water provider.
28. “Water Shortage” means the conditions under which the ([governing body](#)) of ([city/county](#)) or a higher authority, such as the Utah State Government, determines that there may not be enough water available to meet the present and anticipated needs of the users or the conditions require a temporary reduction in total use within a particular area to protect water resources from serious harm. A water shortage usually occurs due to drought.
29. “Waters of the state” means all streams, lakes, ponds, marshes, watercourses, waterways, wells, springs, irrigation systems, drainage systems, and all other bodies or accumulations of water—surface and underground, natural or artificial, public or private—that are contained within, flow through, or border upon this state or any portion thereof, except bodies of water that are confined to and retained within the limits of private property and that do not constitute or develop into a nuisance, public health hazard, or menace to fish and wildlife.
30. “WaterSense” means the U.S. Environmental Protection Agency’s WaterSense program, which is a voluntary partnership program that provides a label for water-efficient products and serves as a resource for water conservation education.

Section 3. APPLICABILITY

The provisions defined by all sections in this ordinance shall apply to all users; existing, new, and redeveloped properties for public agency projects or projects on public entity property; private, commercial, and industrial development projects; developer-installed plumbing fixtures in multi-family and single-family residential projects; and homeowner-provided plumbing fixture improvements within properties using water from water supplies managed or distributed by water providers servicing users or properties within ([city/county](#)). The provisions of this ordinance apply to each user, as defined in Section 2(23) within the jurisdictional boundaries of ([city/county](#)), with the following exceptions.

- a) Section 4 does not apply to existing developments, as defined in section 2(5), though it is recommended that owners of existing developments incorporate and adopt the requirements for new and redeveloped properties, as defined in this ordinance.

Section 4. INDOOR WATER USE REQUIREMENTS AND CONSERVATION MEASURES FOR NEW DEVELOPMENTS AND REDEVELOPMENTS

- 1. All plumbing installations in new buildings and installations of new plumbing fixtures in existing buildings shall comply with Utah statutory requirements related to indoor plumbing code Utah Code Annotated § 15A-1-204(8), including the following maximum flow rates or quantity requirements.
 - a) Toilets:
The maximum flush volume of toilets, which include tank and flushometer-valve toilets, shall not exceed 1.6 gallons per flushing cycle.
 - b) Urinals:
The maximum flush volume of urinals in new developments or redevelopments shall not exceed 0.50 gallon of water per flushing cycle.
 - c) Faucets:
The flow rate for faucets shall meet the following standards.
 - i. The maximum flow rate for private lavatory faucets shall be less than or equal to 1.50 gallons per minute (gpm) at 60 pounds per square inch (psi).
 - ii. The maximum flow rate for public-use lavatory faucets shall be 0.50 gpm at 60 psi.
 - iii. The maximum flow rate for public-use lavatory faucets with metering shall be less than or equal to 0.25 gallons per metering cycle.
 - iv. The maximum flow rate of kitchen sink faucets shall be less than or equal to 2.20 gpm at 60psi.
 - d) Shower heads:
The maximum flow rate of showerheads in new developments and redevelopments shall be equal to or less than 2.0 gpm at 60 psi.
- 2. It is recommended, but not required, that all fixtures used in new developments or redevelopments or used to replace existing fixtures be WaterSense-labeled products to increase water conservation while ensuring performance.

Section 5. OBLIGATION TO FIX LEAKS, BREAKS, AND MALFUNCTIONS

1. The property owner shall repair any damaged, defective, or malfunctioning component of the property that has resulted in leaking of water within 15 days of discovering the leak.

Section 6. EXCEPTIONS TO THE INDOOR WATER USE CONSERVATION MEASURES

1. Exception 1.
2. Exception 2.

Section 7. VARIANCES

1. A variance from the flow rate and quantity standards identified in Section 4 may be granted by the (governing body) of (county/city) if strict application of the measures identified in Section 4 or 5 will lead to an unreasonable or unfair result with substantial impact to the user's economic status, health, or create other hardship(s) on the user or those served by the user. Provided the applicant demonstrates to the (governing body) of (county/city) that compliance with one or more provisions of this ordinance a variance may be granted only upon a demonstration that such hardship exists and is not self-imposed. If a variance is granted, the user shall be required to post a notice at each physical address to which the variance pertains.

Section 8. ENFORCEMENT

1. The listed water fixture, appliance restrictions and all other provisions of this ordinance shall be subject to enforcement action.
2. The (governing body) of (county/city) authorizes law enforcement officials, as defined in section 2(1) to enforce the provisions of this ordinance.

Section 9. PENALTIES

1. (Governing body) may impose a criminal penalty for violations of the provisions of this ordinance. Penalties for individuals, or other entities to be determined by municipality.
2. Each day in violation of this Ordinance shall constitute a separate offense. Law enforcement officials may provide violators with no more than one (1) written warning.

3. Section 10. EFFECTIVE DATE

This ordinance shall take effect immediately upon its adoption.