



WATER FORWARD
INTEGRATED WATER RESOURCE PLAN
FY 2018-2019 Annual Report



**A WATER PLAN
FOR THE NEXT
100 YEARS**

austinwater.org



Introduction

Water Forward is the City of Austin's 100-year integrated water resource plan developed to create a resilient and sustainable water future in the face of challenges posed by population growth, climate change, and droughts worse than those we have experienced in the past. The Austin City Council adopted the Water Forward plan in November 2018.

Austin Water led the development of the plan using a One Water approach that balances multiple objectives including water reliability, social, environmental, and economic benefits. The plan's guiding principles (listed to the right) were crafted in collaboration with the Council-appointed Water Forward Task Force to reflect our community's values and continue to inform current implementation efforts. Austin Water is also working to understand and consider equity and affordability impacts in implementing the plan.

The Water Forward plan includes strategies to reduce potable water demand, increase the use of alternative and reclaimed water, protect our core Colorado River and Highland Lakes supplies, and build potable supply resiliency during future droughts with strategies like Aquifer Storage and Recovery (ASR).

Austin Water is leading the implementation of the plan and continues to work with the Water Forward Task Force and other City departments. Current implementation efforts include onsite reuse and reclaimed water code changes, development of conservation programs, working with our regional partners to protect our core supplies, and procuring a consultant to assist in the identification of potential ASR pilot locations and future ASR program management. The utility is also continuing to engage the community to develop the relationships and resources necessary to support the plan implementation process.

This report documents Austin Water's progress made during Fiscal Year 2018-2019 (FY19)¹ to implement the Water Forward plan. Most of the FY19 implementation efforts were aimed at getting key strategies underway. During this ramp-up period, it was expected that little quantifiable water savings or yield would be achieved from new strategies; however, existing conservation and reuse programs continue to provide valuable resilience benefits to our community. Staff also made considerable progress on near term Water Forward strategies as described in the following pages.



WATER FORWARD GUIDING PRINCIPLES

Austin's Water Forward is a program to develop a long-term integrated water resources plan for the next 100 years. The following represents the plan's guiding principles:

- *Recognizing that Colorado River water is Austin's core supply, continue a strong partnership between the City and LCRA to assure its reliability*
- *Continue Austin's focus on water conservation and water use efficiency*
- *Strengthen long-term sustainability, reliability, and diversity of Austin's water supply through maximizing local water resources*
- *Avoid severe water shortages during times of drought*
- *Focus on projects that are technically, socially, and economically feasible*
- *Continue to protect Austin's natural environment, including source and receiving water quality*
- *Ensure Austin's water supply continues to meet/exceed all federal, state and local public health regulations*
- *Align with Imagine Austin's "Sustainably Manage Our Water Resources Priority Program"*
- *Maintain coordination and communication with regional partners*
- *Engage the public and stakeholders throughout the plan development process*

¹ This annual report covers the period from October 1, 2018 to September 31, 2019, which aligns with the City of Austin fiscal year. Many Austin Water performance metrics, including gallons per capita per day (GPCD), are reported on a fiscal year basis. Some metrics that Austin Water reports to other agencies including Texas Commission on Environmental Quality (TCEQ) and Texas Water Development Board (TWDB) are tracked on a calendar year basis from January 1st to December 31st. Most of the data in this document was able to be reported on a fiscal year basis. In some instances only calendar year data was available and that has been noted where necessary.

FY19 Achievements

Water Forward Plan approved by Council in November 2018

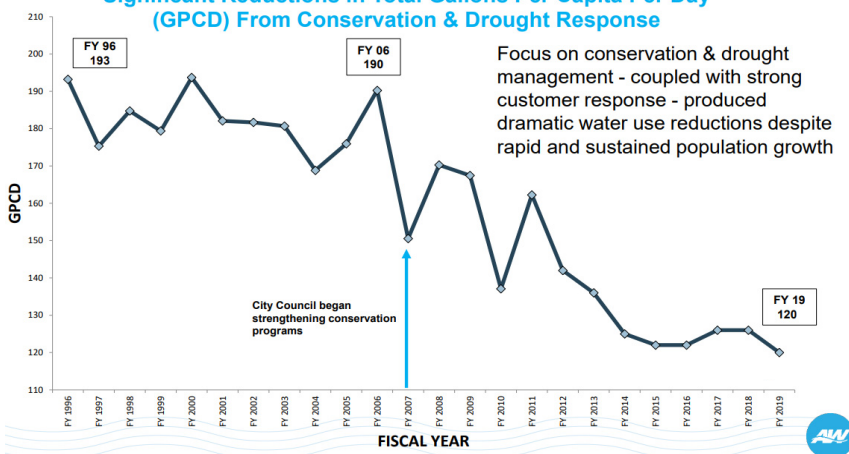


Recognized by The American Academy of Environmental Engineers and Scientists and awarded the Grand Prize in Planning

Developed and included benchmarking and alternative water code changes in the Land Development Code Revision.



Significant Reductions in Total Gallons Per Capita Per Day (GPCD) From Conservation & Drought Response

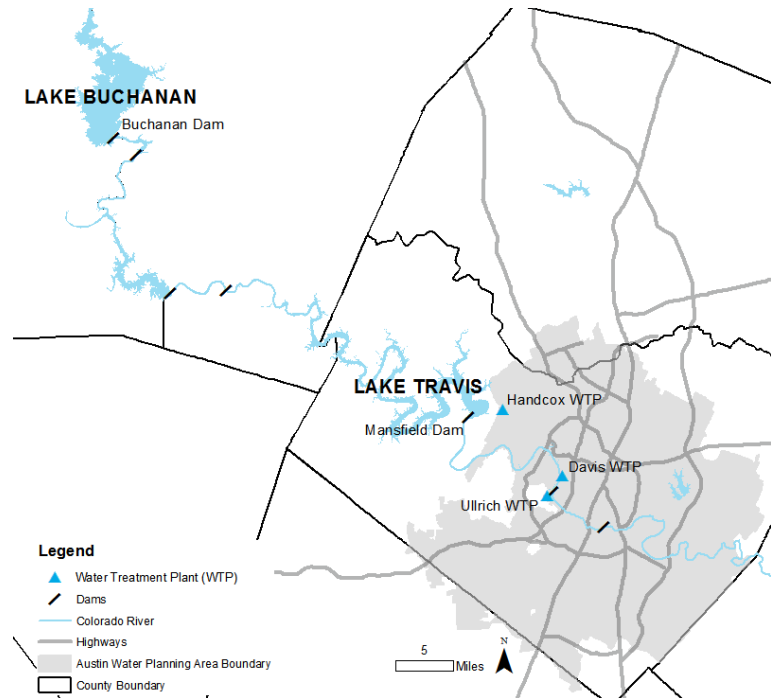


120 GPCD
Achieved new historic low in per capita water use.

Water Supplies, Customers, and Water Use

Water Supplies

All of Austin's drinking water is surface water from the Colorado River. The river is divided into two sections, the upper and lower Colorado River. The upper Colorado River begins in West Texas on the Llano Estacado and flows southeast. The lower Colorado River basin begins downstream of Lakes O.H. Ivie and Brownwood and extends down to Matagorda Bay and the Gulf of Mexico. Six dams on the lower Colorado River form the six Highland Lakes: Buchanan, Inks, LBJ, Marble Falls, Travis, and Austin. All of the lakes besides Lake Austin are owned and operated by the Lower Colorado River Authority (LCRA). Lake Austin is owned by the City of Austin and operated by the LCRA. Lakes Buchanan and Travis are the region's water supply reservoirs. Lake Travis also acts as the region's flood control reservoir. Water from the Colorado River and the Highland Lakes is available to the City through a combination of state-granted run-of-river water rights and a water supply contract with LCRA for firm water, which is water that is expected to be available without shortage through a repeat of the drought of record.



During calendar year 2019, Lakes Buchanan and Travis received approximately 930,000 acre feet (AF) of inflows, which is about 23% below the long-term average calendar year inflow volume of approximately 1.2 Million AF per year. While 2019 was not an unusual year in terms of total inflows, it was remarkable in that 89% of the total inflow occurred in the first six months of the year. From summer through the end of calendar year 2019, the combined storage of these two lakes dropped from full (approximately 2 Million AF) to approximately 1.7 Million AF.

Customers and Water Use

Total pumpage out of Davis, Ullrich, and Handcox Water Treatment Plants for Fiscal Year 2019 was approximately 47.3 Billion Gallons (145,000 AF). The corresponding river diversions from these plants totaled 150,000 AF. This amount was approximately 46% of Austin Water's total 325,000 AF of firm supply through Austin's long-term water supply agreement with the Lower Colorado River Authority.

Of note, total water use in Austin in FY19 was equal to 120 gallons per capita per day. This new water use milestone follows a steady declining trend in water use per capita that began after 2006. Also, Austin's total overall water use has dropped even as population has increased. Austin Water officials have worked with customers to achieve significant water savings through a comprehensive suite of water conservation programs and measures including once-a-week watering for automatic irrigation systems, a conservation-oriented tiered water rate structure, reclaimed water use, water loss control, conservation incentive programs across all customer sectors, public education and outreach, water waste enforcement, and water efficiency ordinances for plumbing fixtures and equipment. These measures and programs were developed with input from customers, citizen task forces, advisory groups, and the Austin City Council.

Protecting our Core Colorado River Supplies

During FY19, Austin Water staff continued to work with our regional partners to protect our core Colorado River supplies. Considerable effort went into participating in the Lower Colorado Regional Water Planning Group's process to develop the Region K water plan. This plan is due to the Texas Water Development Board in 2021. Austin Water was closely involved in the Region K process. Austin Water staff participated as the Municipalities interest group representative in the Planning Group and was involved in committees such as the Water Modeling, Water Management Strategies, and Legislative and Policy Committees. Thanks to all the hard work done in 2019, the Region K group was able to approve an Initially Prepared Plan to submit to the Texas Water Development Board in early 2020.

Austin Water also continued to work with the Lower Colorado River Authority (LCRA) in FY19, both through the COA-LCRA Water Partnership and through LCRA's Water Management Plan (WMP) update process. Through the Water Partnership, staff discussed and shared information about key issues related to the Colorado River and the Highland Lakes, including flooding, zebra mussels, water rights, conservation, and supply planning. Through the LCRA WMP update process, Austin and other stakeholders participated as LCRA submitted the WMP through Texas Commission on Environmental Quality (TCEQ) technical review and in the subsequent public meeting. Austin's participation in the WMP update process helped ensure safeguards for firm water customers and continued protection of our core Colorado River supplies. In February 2020, TCEQ approved LCRA's new WMP. Referred to as LCRA's 2020 WMP, the new plan is now in effect.

Additional efforts related to protecting core Colorado River supplies in FY19 included continued participation in the Imagine Austin Sustainably Manage our Water Resources (SMOWR) priority program and participation in the Water Utility Climate Alliance. In the SMOWR priority program, Austin Water and the Watershed Protection Department work together to share ideas, identify joint opportunities, and work to manage the City's water. An important SMOWR project in FY19 was coordination between the two departments on the City's Land Development Code rewrite. In addition to SMOWR, Austin Water continued to participate in the Water Utility Climate Alliance (WUCA). Through WUCA, Austin Water hosted a Climate Adaptation training in Austin, where utility staff and other water industry professionals were able to learn more about climate change, share climate change planning approaches, and improve on how to communicate this information with stakeholders.

Community Outreach and Engagement

Major Water Forward stakeholder engagement efforts during FY19 included hosting two public stakeholder workshops to discuss onsite reuse and other code changes that Austin Water was developing to include in the Land Development Code Revision. AW staff also attended numerous Land Development Code related workshops and public meetings. Austin Water continues to engage in various community, industry, and public events to make presentations and share information about the Water Forward Plan and implementation efforts underway.

Conservation

Existing Conservation Programs

Austin Water has a strong water conservation program. In May 2016, the [Texas Living Waters Project](#) recognized Austin's water conservation program as the highest-scoring across the state in their Texas Water Conservation Scorecard. Austin Water's conservation programs have continued to progress since this recognition.

Austin Water advances water conservation programs through a variety of strategies implemented by the Water Conservation Division, including but not limited to providing rebates for water-saving equipment, distributing free water-saving equipment, and public education on the importance of water conservation. For more information on existing AW conservation programs, please visit Ch. 6 of the Water Forward report or austintexas.gov/department/water-conservation.

Advanced Metering Infrastructure (AMI)

In FY19, the Advanced Metering Infrastructure (AMI) initiative continued to move towards implementation. The procurement process for installation, hardware, and software for the AMI system progressed and a request for proposals was issued. Implementation planning and business process changes to meet AMI needs continued in several Austin Water and City sectors including Information Technology, Purchasing, Stores, the Meter Shop, Retail Customer Service, and the Public Information Office. Large meters that are incompatible with AMI have begun to be replaced. Work started to prepare the billing and work order systems to accommodate AMI data requirements. Under the current schedule, initial installations for the pilot stage will begin in the Summer of 2020, with full implementation to begin in 2021.

The AMI demonstration project at River Place and Glenlake began to wind down in 2019. Since 2016, over 300 AMI registers were installed to provide Austin Water staff experience with operating an AMI system. The knowledge gained through this pilot was applied to shaping the AMI procurement requirements and the evaluations of the responses. The demonstration project is in its final stages and equipment no longer needed for the pilot is being redeployed on Austin's Parks and Recreation Department properties to assist in identifying high use patterns and leaks.

Austin Water partnered with the University of Texas to conduct an equity impact study on the implications of AMI for marginalized and low-income communities of color. The study is focusing on affordability, communications, and customer trust issues and will offer recommendations that will be evaluated for implementation when the report is finalized.

Utility-Side Water Loss Control

Austin Water's water loss control program includes active leak detection and condition assessment, maintaining excellent response times to leaks, and pipeline renewal. During FY19 AW met all performance measure goals related to leak detection and condition assessment and responded to over 92% of priority one leaks within 3 hours. AW's efforts to minimize water loss through pipeline renewal included replacing more than 2 miles of deteriorated mains, replacing more than 500 polybutylene water service lines, and updating the main replacement prioritization matrix to better incorporate water loss as a factor.

Austin Water measures water loss from the distribution system using a performance indicator called the infrastructure leakage index (ILI). The Texas Water Development Board recommends maintaining an ILI between 3.0 and 5.0 (lower scores are better). In calendar year 2018 Austin Water's ILI was 3.84, which was higher than the utility's target ILI of 2.7 for 2020. The calendar year 2019 water loss report is being developed for its submittal to the TWDB by May 1, 2020.

AW has procured a consultant to validate water treatment plant meter readings to improve the reliability of our water loss metrics. AW will continue to pilot new technologies in FY20 to further optimize the

effectiveness of our leak detection efforts. In addition, AW will continue to study system water loss and develop strategies to reduce water losses using new data analytics approaches.

Commercial, Industrial, and Institutional (CII) Ordinances

In the 2018 Water Forward plan, the savings yield from this strategy was based on the assumption that existing cooling towers were more inefficient. It now appears that existing cooling towers are more efficient than previously believed and there is likely less opportunity to reach the 2020 and subsequent savings targets through cooling tower efficiency. Staff will continue to evaluate other Commercial, Industrial, and Institutional (CII) Ordinances to increase water use savings.

Water Use Benchmarking and Budgeting

Austin Water staff undertook a significant effort to develop draft water balance calculators that could be used to estimate a new development's water use. The calculators were developed to use site plan information to estimate potential indoor and outdoor water use and captured potable and non-potable water needs. The calculators also estimate potential alternative sources of water that could be captured by the development, such as rainwater, stormwater, graywater, blackwater, and others. During the Summer of 2019, Austin Water staff gathered input from other City departments and external stakeholders on the draft water balance calculators and continued to make improvements to this tool.

In FY20, following the adoption of Land Development Code revisions, Austin Water will begin requiring that new commercial and multi-family developments must submit a water balance along with a site plan. Developments greater than 250,000 square feet will also be required to meet with Austin Water staff to discuss water balance results, water efficiency benchmarks, and alternative water incentives to help identify ways water can be used more efficiently.

Reuse and Alternative Waters

Alternative Water Ordinances

On May 2, 2019, the Austin City Council directed staff to work on an accelerated schedule, where feasible, to include regulatory requirements for developments greater than 250,000 square feet (SF) related to water benchmarking, dual plumbing, alternative water, and landscape transformation in the Land Development Code Revision process. In response to Council direction, Austin Water began a stakeholder engagement process to help inform the development of ordinance language. The utility held public workshops on June 25, 2019 and July 23, 2019 to gather community and stakeholder input.

Austin Water considered input from stakeholders and the Water Forward Task Force when developing ordinance changes that the utility ultimately submitted for inclusion in the Land Development Code Revision. Ordinance changes included:

- A mandatory water balance submittal for new commercial and multi-family development and expanded reclaimed water use and connection requirements to be effective Summer 2020,
- A regulatory framework for onsite systems and incentive program to be implemented in Fall 2020,
- Mandatory requirements for commercial and multi-family developments over 250,000 square feet to use reclaimed or onsite alternative water to meet non-potable demands, to be effective in 2023, and
- Revisions to the reclaimed water mandatory connection ordinance. Key changes are extending the mandatory connection distance from 250 feet to 500 feet for large developments (greater than 250,000 SF), eliminating the significant financial hardship variance for large developments, and moving the ordinance to the Land Development Code where it is easier to find.

Austin Water staff have also coordinated with City staff leading the revision of the City's Landscape Ordinance to work toward reducing water demand. City Council is anticipated to vote on the third reading of the Land Development Code Revision in March/April, with adoption potentially taking place in Spring 2020.

Austin Water staff are currently working to develop the onsite reuse regulatory framework and are planning to hold public workshops to gather stakeholder input on the framework in Summer 2020.

Alternative Water Incentives

During FY19, Austin Water staff performed a literature review, including research and contacting other utilities, to explore approaches to providing rebates for alternative water. This information informed the development of new and restructured alternative water rebates proposed for implementation and adoption in FY20 and FY21. This work is ahead of the previously planned Water Forward adaptive management plan timeline, which anticipated implementation by FY2022.

Austin Water staff currently has a rebate for alternative water use in commercial facilities, which pays up to \$100,000. For more information on existing alternative water rebates, please visit the Austin Water Conservation [Rebates, Tools, and Programs page](#). Austin Water staff is developing or has developed components of a suite of potential new alternative water incentives targeted at all customer classes from single-family residential to large commercial developments. For example, staff is developing a new onsite water reuse pilot grant for new large commercial developments. These rebates would be expected to be in place by the end of calendar year 2020.

Sewer Mining

During calendar year 2019 Austin Water collaborated with one of its large volume customers on their feasibility analysis for a sewer mining project to provide reuse water for the customer's utility systems. The project could provide up to 280 million gallons per year (MGY) of potable water offset annually, and up to 1 million gallons per day (MGD) potable water offset during peak demand months in the summer. The

customer will decide this year if they will pursue the project once the project feasibility can be determined. AW staff will work with the customer's representatives to develop necessary technical legal arrangements to facilitate the project.

Distributed Wastewater Reuse

Austin Water has several projects to increase the use of reclaimed water from satellite wastewater treatment facilities and other decentralized sources. Currently, Austin water owns and operates three "package" wastewater treatment plants (WWTPs) that are smaller in scale than centralized WWTPs and serve communities adjacent to their sites. In FY19, the Balcones WWTP, Lost Creek WWTP, and River Place WWTP provided approximately 443 acre-feet of reclaimed water in total, used to satisfy irrigation demand for nearby golf courses.

Austin Water has begun planning to incorporate distributed wastewater reuse into other satellite wastewater treatment facility expansions. The Wild Horse WWTP is currently in design for a treatment capacity expansion up to 2.25 MGD, including space requirements for future reclaimed facilities. As part of the developer agreement with the City of Austin, the Pearce Lane WWTP was required to be designed and constructed to meet reclaimed water needs for public open space and parks, as well as private parks and recreation facilities for each phase of development, up to 1.2 MGD capacity. The WWTP site also includes space requirements to incorporate reclaimed water service with future treatment capacity expansions, up to 2.25 MGD capacity.

Direct Non-Potable Reuse (Centralized Reclaimed Water System)

A primary activity of the reclaimed water program is constructing a series of projects known as "Completing the Core." These projects constitute a pipe loop through the core of the City that improves system capacity, customer service, and system reliability by allowing the conveyance of reclaimed water from north to south or vice versa when needed. Completing the core is intended to automate pumping, increase the number of customers, increase the volume of water served, and increase reclaimed system revenue. Completion of the Montopolis Tank and Pump Station, the Burleson Phase I Main, and Burleson Phase II Main add to the core loop and frees capacity in more than 7 miles of main for new customers to the south and east of the airport. The Oltorf Phase 1 Main and Oltorf Phase 2 Main started design and are nearing the 30% design milestone. Design engineers for the Barton SoCo Main and Travis Heights Main are being selected.

To improve service, the reclaimed water program is also proactively addressing issues discovered through the addition of the Google Building as a toilet flushing customer. Some of the identified operational issues have included water color, annual cross-connection testing, struvite formation, water hammer, and flushometer valve selection. Based on our experience with toilet flushing customers, Austin Water developed and distributed design recommendations to improve the functioning of these types of plumbing systems in future buildings.

During FY19 the number of reclaimed water customers increased from 136 to 145, and the number of bulk fill station customers increased from 76 to 120. The centralized reclaimed water volume delivered in FY19 was 1,349 MG (4,140 acre-feet), exceeding the Water Forward goal for 2020.

Drought Supplies

Aquifer Storage and Recovery

In FY19, progress was made towards implementing an Aquifer Storage and Recovery (ASR) project for Austin, as included in the Water Forward Plan. The two main implementation actions accomplished in FY19 were the formation and kickoff of an ASR technical advisory group and the development and issuance of a solicitation to secure professional services for an ASR pilot and ASR program management.

The ASR technical advisory group is made up of water resource professionals with ASR experience and includes representatives from state agencies, academia, and water utilities. This group met in 2019 to share their ASR experiences and provide guidance and feedback on Austin's ASR project. At the kickoff meeting, topics related to stakeholder engagement, site selection, and piloting approaches were discussed, among other things. Austin Water is in the process of organizing a second ASR technical advisory group meeting for spring or summer of 2020 and plans to continue to meet with this group throughout development of the ASR project.

In addition to forming a technical advisory group, ASR efforts in 2019 also focused on development of a Request for Qualifications (RFQ) for professional services related to the ASR project. After internal discussions and incorporating lessons learned from hearing others' experiences through the ASR technical advisory group, an RFQ was issued in November of 2019 for ASR Pilot and ASR Program Management services. Austin Water is currently in the 'no contact period' regarding this solicitation and anticipates having a consultant team on board by Summer 2020.

Looking Forward

Commercial, Industrial, and Institutional (CII) Ordinances

Austin Water's Conservation Division has proposed new administrative penalties for cooling tower efficiency standards, equipment, registration, and inspection requirements for adoption in FY21.

Landscape Transformation Incentives and Ordinances

Planned to be implemented in FY22 and FY25, respectively, Austin Water staff will continue to gather data and input to inform the development of these strategies for residential customers.

Irrigation Efficiency Incentive

In FY20 Austin Water's Conservation Division is planning to provide rebates for additional irrigation system efficiency components.

Alternative Water Ordinance and Incentives

Austin Water staff will be working in FY20 to develop an onsite water regulatory program and to develop a suite of incentives to address multiple alternative water types and multiple scales of development, from single family homes to large developments greater than 250,000 SF.

Indirect Potable Reuse and Capture Lady Bird Lake Inflows

Austin Water staff will continue to gather data to inform the implementation of a future Indirect Potable Reuse project, which shares significant infrastructure components with the Capture Lady Bird Lake inflows strategy, both of which are planned to be implemented by 2040.

Brackish Groundwater Desalination and Off Channel Reservoir

These strategies are planned to be implemented by 2070.

Metrics

Future projections and targets in the tables below are as reported in the adopted 2018 Water Forward plan. Savings and yield targets will be updated starting with the 2023 Water Forward plan update to reflect strategy implementation progress and improvements to strategy savings and yield estimates.

Population, Pumpage and Gallons Per Capita Per Day (GPCD)

	FY19 Estimate	2020 Projection	2040 Projection
Served Population (Retail and Wholesale)	1,078,171	1,101,600	1,577,800
Potable Pumpage ² (Acre Feet per Year)	145,00	144,000	160,000
Potable GPCD ³	120	117	91
Potable and Non-Potable Water Provided ⁴ (Acre Feet per Year)	149,724	145,000	182,000
Potable and Non-Potable GPCD ⁵	124	117	103

Water Forward Strategy Savings and Yield

Strategy	FY19 Savings or Yield (acre-feet)	2020 Target (acre- feet/year)	2025 Target (acre- feet/year)	2040 Target (acre- feet/year)
Advanced Metering Infrastructure (AMI)	-	600	600	3,880
Utility-Side Water Loss Control (savings) ⁶	-	3,110	4,090	9,330
Commercial, Industrial, and Institutional (CII) Ordinances	-	1,060	1,060	1,060
Water Use Benchmarking and Budgeting	-	-	-	5,950
Landscape Transformation Ordinance	-	-	-	3,040
Landscape Transformation Incentive	-	-	80	320
Irrigation Efficiency Incentive	-	40	80	210
Alternative Water Ordinance	-	-	210	1,620
Alternative Water Incentive	-	-	500	3,860
Sewer Mining	-	-	10	1,000
Distributed Wastewater Reuse ⁷	443	410	420	3,560
Centralized Reclaimed Water System ⁸	4,140	3,980	4,590	15,480
Aquifer Storage and Recovery	-	-	-	60,000
Brackish Groundwater Desalination	-	-	-	-
Indirect Potable Reuse (IPR) through Lady Bird Lake	-	-	-	11,000
Capture Local Inflows to Lady Bird Lake	-	-	-	3,000
Off Channel Reservoir	-	-	-	-

² Potable pumpage refers to total potable water pumped from Handcox, Ullrich, and Davis Water Treatment Plants. Potable GPCD is the potable pumpage divided by total served population and 365 days in the year.

³ Potable GPCD is the metric commonly tracked by the water utility industry and is what is reported to Texas Water Development Board.

⁴ For the purposes of this report, Potable and Non-potable Water Provided includes both potable pumpage and non-potable water demand met by the utility's centralized reclaimed water system and distributed wastewater reuse facilities.

⁵ Potable and Non-potable GPCD is the total potable and non-potable water provided divided total served population and 365 days in the year.

⁶ The FY19 water loss audit is currently in development and will be completed in May 2020. For more information on the water loss control strategy please see page 6.

^{7, 8} In the 2018 Water Forward plan, future targets for the Distributed Wastewater Reuse and Centralized Reclaimed Water strategies were reported as only the additional future demand over the baseline. This additional demand has been accounted for in the totals included in the total future demands reported in the table above. Targets in the 2018 Water Forward Plan for Distributed Wastewater Reuse were 0 AF in 2020, 10 AF in 2025, and 3,150 AF in 2040. Targets in the 2018 Water Forward Plan for the Centralized Reclaimed were 500 AF in 2020, 1,100 AF in 2025, and 12,000 AF in 2040.