# Austin Water

## The 100-year plan to transform water management with localized infrastructure

## Project at a Glance

### Utility Overview

- Utility: Austin Water
- Location: Austin, Texas
- Population served: 950,000
- Service area: 300 square miles

### Challenges

- Rapid population growth
- Drought and lack of reliable water supply
- Climate change

### Solution

- The "Water Forward Plan," an integrated water resources plan based on a 100-year planning horizon.

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### Planning Benefits

**Accounts for anticipated impacts of climate change**

**Consistent with Texas state law requirement to develop 50-year integrated plan**

**Allows planners to think of transformative solutions**

**Introduces complexity to inspire creative problem-solving without eliminating all management constraint**

### Anticipated Implementation Benefits

**Increased resilience from greater reliance on local water supplies**

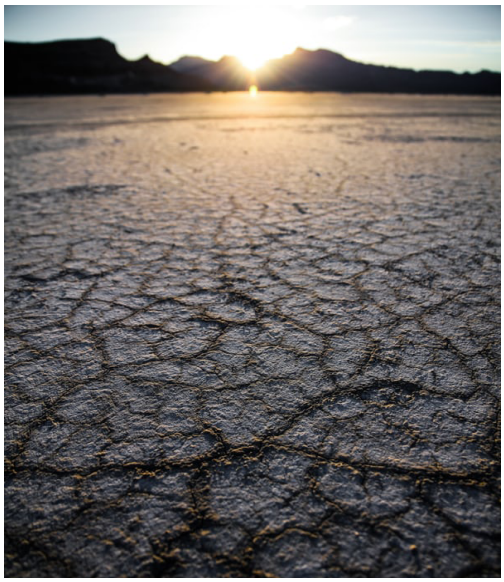
**Expansion of innovative conservation and efficiency programs**

**Assurance that Austin's future residents have access to clean and reliable water supplies**

## BACKGROUND

Austin, the Texas state capital, is located in south central Texas and covers about 300 square miles. The Colorado River (the Texas Colorado River) flows through the city, which is home to nearly 1 million people, making it the 4th largest city in Texas and the 11th largest in the United States. Austin has a temperate-to-hot, highly variable climate with an average of 300 days of sunshine a year. Annual rainfall averages 33 inches with spring and fall as the wettest seasons.

All of Austin's drinking water is supplied from the Colorado River. A series of dams along the river form the Highland Lakes, two of which—Lake Buchanan and Lake Travis—serve as the region's water supply reservoirs and flood control system. Austin Water, the city's public water utility, has been providing water and wastewater services to the local community for over 100 years.



Facing several regional water management challenges, Austin needed a **proactive** approach to avoid potential water shortages even in **critical drought years.**

## CHALLENGE

Since as early as 1983, Austin Water has implemented a robust and comprehensive water conservation and reuse programs to reduce peak daily demand and keep rates affordable as a reflection of the community's core value of environmental stewardship. Yet, Austin is still facing several regional water management challenges, including: (1) rapid population growth, (2) susceptibility to drought, and (3) impacts of climate change.

### Population Growth

Austin is one of the fastest growing cities in the country, and Austin Water anticipates the city's population will continue to grow at a rapid pace, with estimates of nearly 1,500,000 residents by 2020 and nearly 2,000,000 by 2040. The city needed to find a way to account for the expanding population and ensure that Austin's future residents have access to clean and reliable water supplies.

### Drought

During a historic 8-year drought that ended in 2016, Austin faced near-record-low reservoir levels that prompted emergency responses. Austin Water needed a proactive approach to avoid potential water shortages even in critical drought years.

### Climate Change

Climate change will bring longer and deeper droughts, heavy rain events, and increases in temperature to the Austin region. Austin Water expects that these climatological changes will have profound impacts on flood and drought patterns and recognized the need for a plan to adapt its water system to this new normal.

## PLAN DEVELOPMENT

Given Austin's fast-growing population, susceptibility to drought, and need to adapt to climate change, the city convened the Austin Water Resource Planning Task Force to evaluate the city's water needs and provide recommendations on how to augment future water supplies. The task force's key recommendation was that Austin needed an integrated water resources plan, i.e., the Water Forward Plan. The Water Forward Plan is Austin's near- and long-term water planning and management roadmap. It is a unique integrated water management plan that solidifies Austin's commitment to sustainable water management into the next century.

The 100-year planning horizon was selected for a few reasons. First, the 100-year timeline was important to accounting for anticipated the impacts of climate change. Second, using such as long timeline allowed the planners to think about the available options in a transformative way by imaging a world a century into the future that is very different from today. Third, Austin Water wanted to include a planning horizon that was consistent with the state's regional planning process based on a 50-year timeline. Finally, the long-range planning structure introduced enough complexity to inspire creative solutions without completely eliminating all management constraints.

## PLAN SUMMARY & ANTICIPATED BENEFITS

The Water Forward Plan seeks to provide for sustainable development and water use where all water supply and demand management options are identified, analyzed, and compared so that the most cost-effective and environmentally sensitive water management strategies are implemented. The plan includes at least 6 key sustainable water management elements: (1) public and stakeholder engagement; (2) reliance on local water supplies; (3) water demand analysis that incorporates onsite reuse; (4) conservation and efficiency programs; (5) climate-science based planning; and (6) clear performance metrics. The implementation of the Water Forward Plan will be an ongoing, iterative process. Immediate next steps include further exploring of innovative financing strategies, incorporating the identified strategies into city ordinances, and continued

| Key sustainable water management elements |
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| Public and stakeholder engagement |
| Reliance on local water supplies |
| Water demand analysis that incorporates onsite reuse |
| Conservation and efficiency programs |
| Climate-science based planning |
| Clear performance metrics |

collaborating with the Austin Integrated Water Resources Planning Community Task Force to identify detailed action items. The six main elements of the Plan are detailed below.

### Public and Stakeholder Engagement

One of the principles guiding the Water Forward Plan was to "engage the public and stakeholders throughout the plan development process," and the plan emphasizes public outreach and community involvement through the implementation phase. Specifically, over the 3.5-year planning process, Austin Water received public input from over 80 outreach events, including:

- 5 Water Forward Public Workshops;
- 4 Targeted Stakeholder Meetings; and
- 10 Summer Series events with one event held in each city council district.

This public engagement was key to equitably reflecting the diversity of Austin's population and Austin Water's customers. During this process, the Austin community identified diversifying water supplies and increasing reliance on local water sources as a core community value.

### Reliance on Local Water Supplies

As the Water Forward Plan is implemented over the next century, community-scale onsite water reuse will come to represent one-third of all additional water supplies that Austin will bring online. This will scale up quickly—by 2040, Austin will produce, capture, and treat 20 times more water from buildings than any other city in the U.S. This will amount to 10 million gallons per day of decentralized non-potable reuse. Focusing on identifying local water supplies in the planning process allowed the City to look at all flows of water within city, including air condition condensate, rain water, stormwater, black water, and other forms of water that buildings create or intercept but were not previously treated as resources.

### Water Demand Analysis

To build out the 100-year plan, Austin Water used several models and multi-criteria decision analyses. These included a "disaggregated demand forecasting model," which projects demand by sector (e.g., single-family residential, multi-family, and commercial). Using this model helped the planners understand where and how water was being used currently and how much current and future demand could be met by onsite non-potable sources. With this model, Austin Water was able to develop refined strategies around conservation, reuse, and additional potable supplies or storage based on the types of water needed to meet particular demands.

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### Conservation and Efficiency

Austin's water conservation and efficiency programs began 35 years ago in 1983. Initially, these programs were started due to concerns with wastewater treatment plant capacity and relied on "old school" conservation measures, e.g., toilet replacement programs. As Austin's needs evolved, so did its approach to conservation and efficiency. By 2010, Austin Water achieved 92% market saturation for water efficient appliances and fixtures. Indeed, Austin Water's conservation programs are highly rated by the Texas Living Water Project and scored 90 out of 100 on the Conservation Scorecard in 2017. In 2018, Austin Water became the third agency in the nation to receive a platinum certification from the Alliance for Water Efficiency for excellence in conservation program operation and management. The Water Forward Plan identifies expanded conservation and efficiency programs, including: advanced metering infrastructure, efficiency requirements for cooling towers, water use benchmarking for buildings of a certain size, and outdoor irrigation efficiency mandates and incentives.

### Climate Science-Based Planning

To incorporate planning for climate change impacts on basin hydrology into the Water Forward Plan, Austin Water contracted with climate scientists to develop forecast data and evaluate, among other things, water availability based on drought conditions that are reflective of future climate change. Because of this climate-based planning, Austin came to understand that conservation and efficiency as well as aquifer storage and reuse were all critically important to meeting its goal to rely on local water given anticipated increases in evaporation losses from surface storage, among other vital issues.

...This will amount to **10 million gallons per day** of decentralized non-potable reuse.

## Clear Performance Metrics

The Water Forward Plan provides that the specified objectives be "measurable," among other criteria. Having measurable objectives will allow Austin Water to determine if the Plan's objectives are being achieved, either through quantitative or qualitative metrics. While these metrics will be refined during the implementation phase, they include: estimated savings from implemented demand management options (e.g., advanced metering infrastructure and utility-side water loss control) through 2025 and 2040, and estimated yield from implemented supply options (e.g., community-scale distributed wastewater reuse and aquifer storage and recovery) through 2025 and 2040.

Austin Water anticipates that the Water Forward strategies will result in multiple co-benefits, including:

- Increased ability to access all local water sources
- Added supply diversity and resilience
- Offset demand for drinking water with "fit for purpose" approach
- Increased resilience in the face of climate change
- Increased resilience to drought

By diversifying Austin's water supply and demand management portfolio, The Water Forward Plan increases the City's ability to maintain a reliable supply for the next 100 years.


Sources

Austin: Geography and Climate
Top 10 Lakes in the Austin Area to Visit this Summer
U.S. Census Bureau: Austin
World Population Review: Austin
Austin Water: Water Forward Integrated Water Resource Plan
Texas Water Conservation Scorecard
Alliance for Water Efficiency G480 Leaderboard

WaterNow Alliance December 17, 2018, Interview with Austin Water Staff