Santaquin Water Use and Preservation Element

DRAFT

Introduction

In 2022, the Utah Legislature passed Senate Bill 110 (SB 110), a law requiring most cities in the state to incorporate water use and conservation planning directly into their overall land use planning efforts. This requirement applies to cities with a population of 5,000 people or more that are experiencing growth and development.

This report outlines the key information and analysis needed to meet these requirements and to support the Water Element of Santaquin's General Plan. This element connects how land is used in the city with how water is used, preserved, and planned for in the future.

Historical Water Use Trends

To better understand how Santaquin uses water today—and how that might change in the future—we looked at how water use has changed over time. This includes how much water is used per person daily (gallons per capita per day, or gpcd) and how that use is split among different types of land (such as residential, commercial, and agricultural areas).

Understanding usage trends is especially important as land use can change over time–for example, when vacant or agricultural land is converted for residential or commercial development. The historical data used for this analysis comes from the Utah Division of Water Rights and focuses on two systems in the city: the drinking water system and the pressurized irrigation (PI) system.

Trends in per capita water usage are shown in Figure 1. Available data regarding usage in the PI system is incomplete.

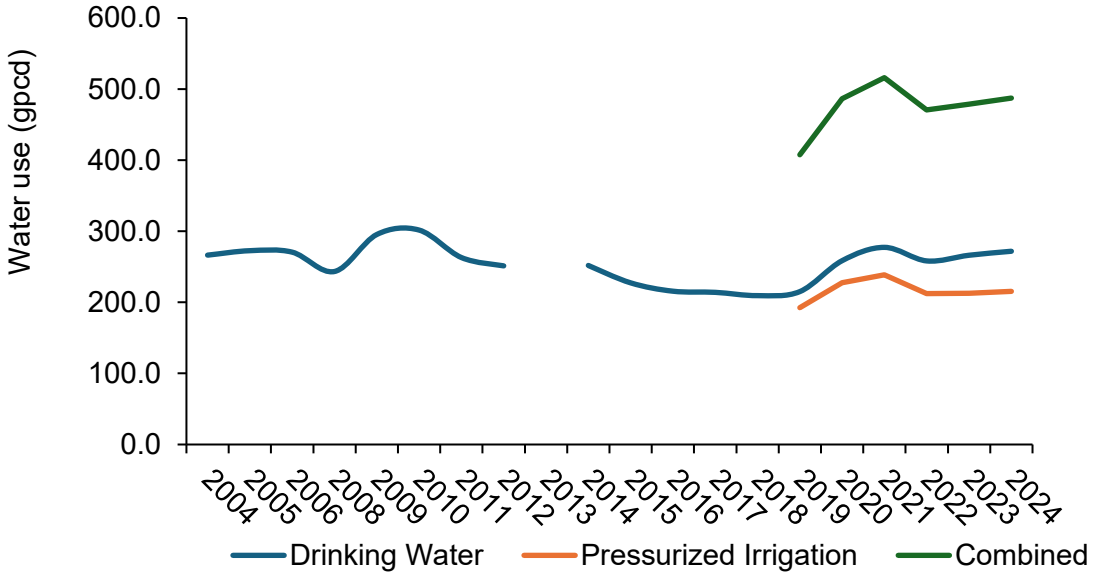

Figure 1. Per capita water usage

Figures 2 and 3 show the trends in residential and commercial usage per connection from Santaquin's drinking water and pressurized irrigation systems.

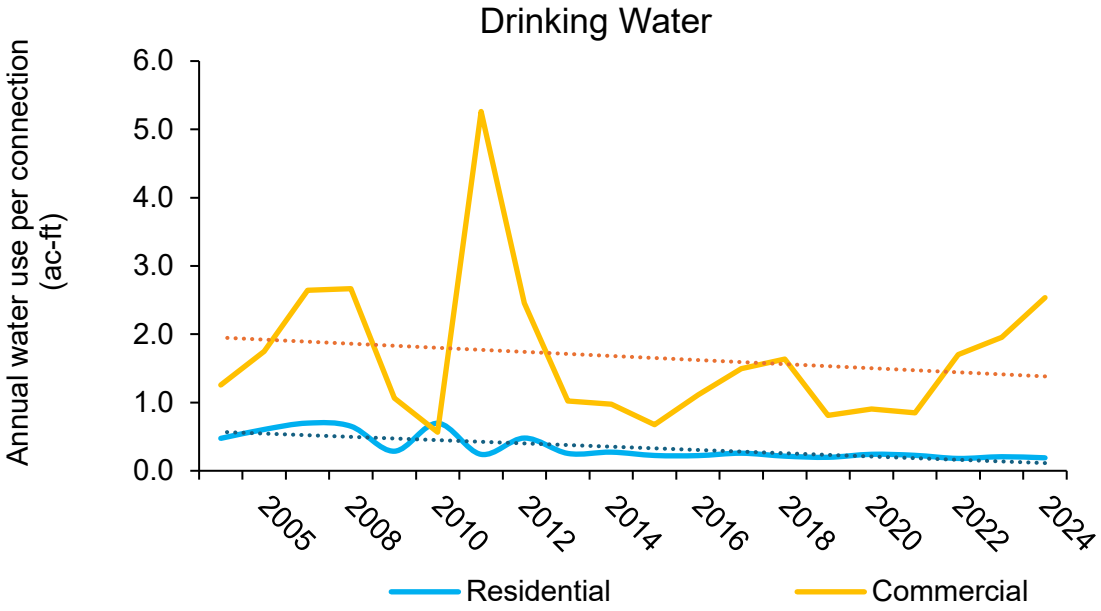

Figure 2. Annual Drinking Water Use Per Connection

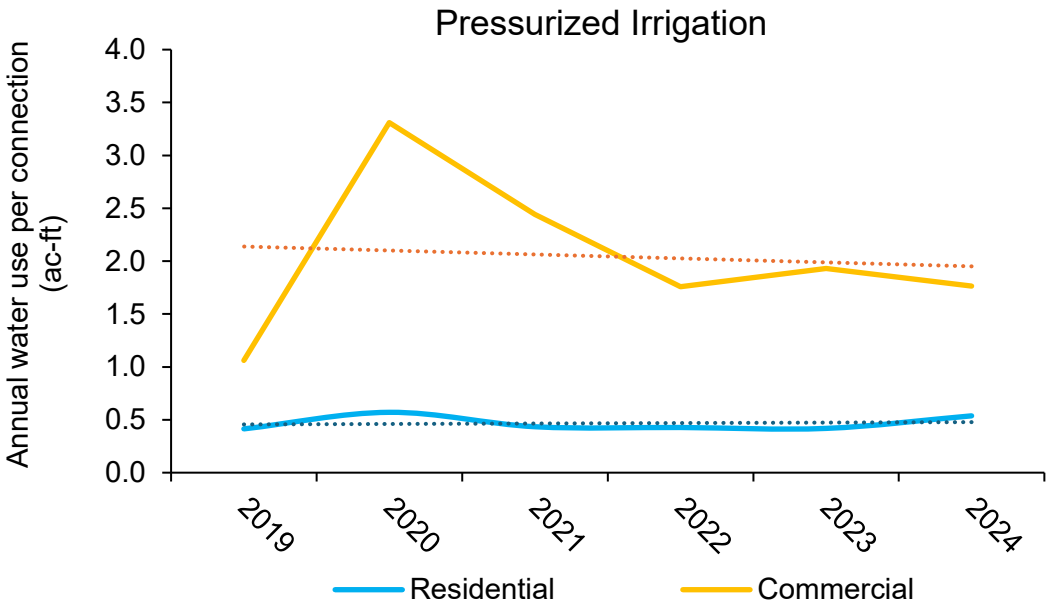

Figure 3. Annual PI Water Use per Connection

Comments on Figures 2 and 3 are as follows:

- Residential use has decreased over time.
- On average, each residential connection uses a combined total of about 0.67 acre-feet of water per year in both systems.

By comparison:

- Commercial water use has varied more widely from year to year. This is expected, as commercial properties (e.g., stores, offices, or warehouses) can have very different water needs.
- On average, each commercial connection uses about 3.50 acre-feet of water annually.

The same analysis was completed for the other land use types (see Figure 4).

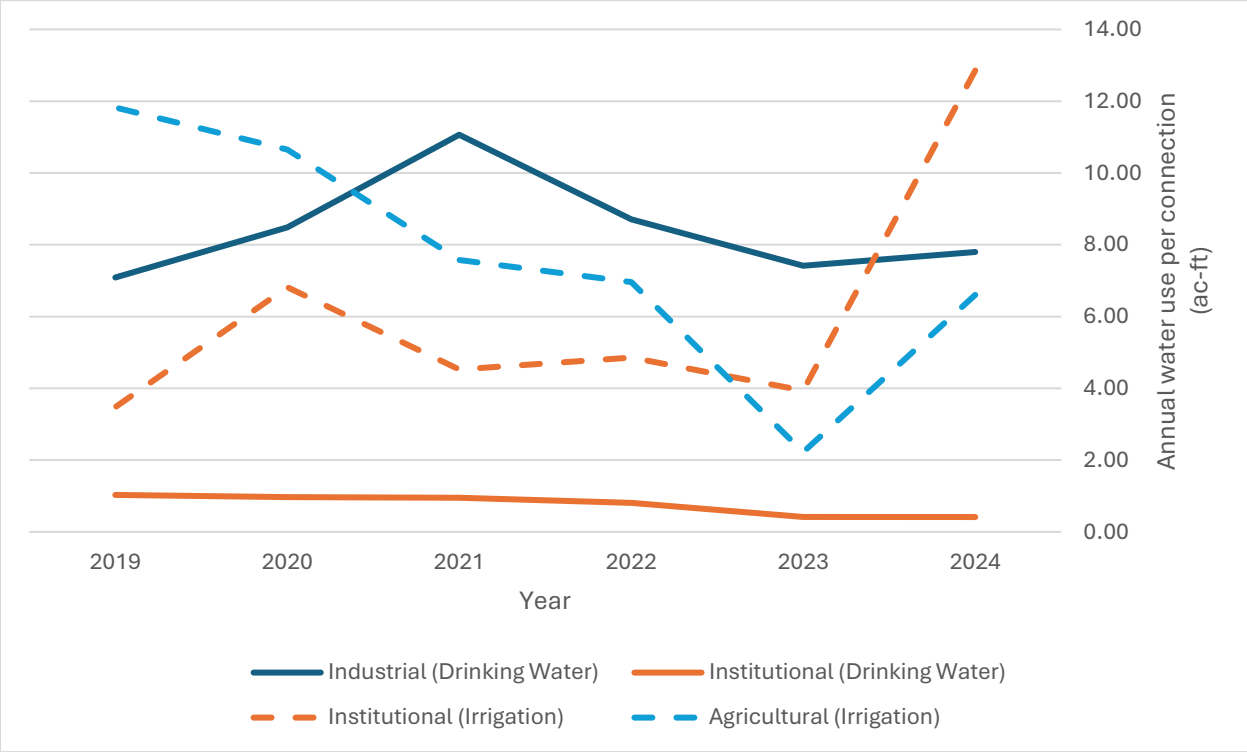

Figure 4. Annual Water Use from Industrial, Institutional, and Agricultural Connections

Figure 4 shows average water use by connection type for industrial, institutional, and agricultural customers, across both drinking water and pressurized irrigation systems. Comments are as follows:

- Institutional irrigation connections use more water on average than institutional drinking water connections. This is most likely related to large, irrigated areas associated with churches and schools. These irrigated areas may present an opportunity for outdoor water conservation.

- Institutional drinking water use has remained relatively consistent and has decreased over time.

By comparison:

- Industrial drinking water use is similar in magnitude to institutional irrigation and reflects the higher volume needs of a few large users.
- Agricultural irrigation use also falls within a similar range but has been trending slightly downward in recent years.

These trends indicate that Santaquin has large users in the institutional irrigation, industrial, and agricultural user categories. Conservation potential may exist for any of these connection types, but is specific to the particular user.

Comparison to State Conservation Goals

The State Water Use Goal for the Provo River region (consisting of Juab, Utah, and Wasatch Counties) is 179 gpcd. Santaquin includes large industrial and agricultural users that significantly increase gpcd usage, and as such, comparing system-wide numbers directly to the State goal would not be a consistent comparison.

An average residence in Santaquin uses 0.67 ac-ft of water per year. With an average household size of 3.7 people, per-capita use is 162 gpcd. Per-capita consumption has decreased over time.

Existing and Future Water Demands

To help Santaquin City prepare for long-term growth, a water budget was developed to compare current and future water supply and demand. This analysis is based on the most recent planning documents: the Santaquin Drinking Water Master Plan (2021) and the Santaquin Pressurized Irrigation Master Plan (2021).

For the drinking water system, historical billing and water production data were used to estimate current Equivalent Residential Connections (ERCs), a standard unit that reflects the water use of a typical household. Using population growth projections and the City's land use plan, the number of ERCs was projected through the year 2060. Since some customers use drinking water for outdoor irrigation, this was also factored into demand estimates. Tools such as aerial imagery, utility system maps, and feedback from City staff were used to estimate the irrigated land served by the drinking water system.

For the pressurized irrigation (PI) system, current irrigated acreage was calculated using aerial imagery. Then, the City's land use plans and typical irrigation rates by land use type were used to estimate future irrigation needs through 2060.

The resulting figures are summarized in Figure 5, which shows indoor and outdoor water demands along with total system demand compared against the available water supply capacity.

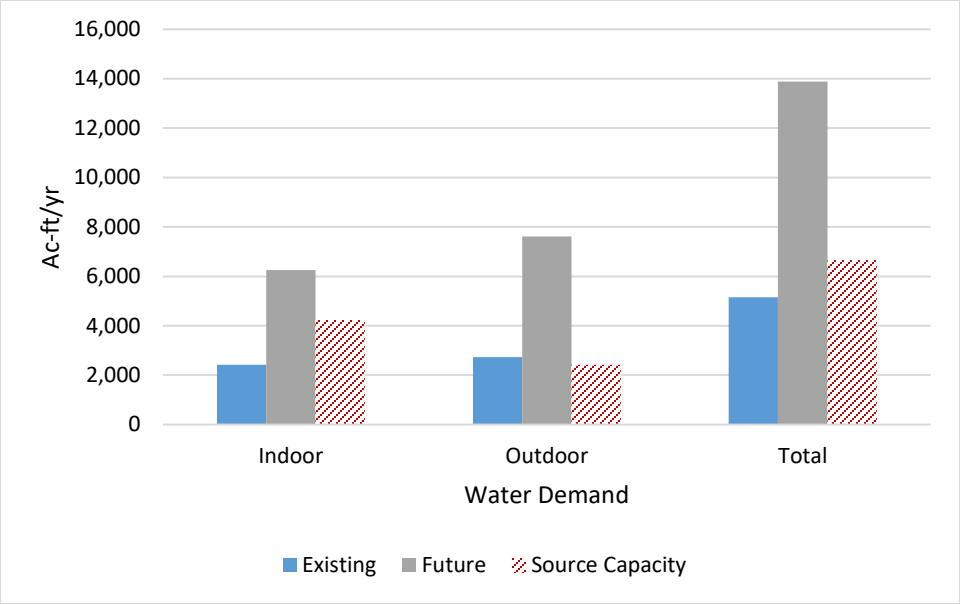

Figure 5. Santaquin Water Budget

Water Budget Summary

Figure 5 indicates that reliable outdoor source capacity for irrigation is slightly less than existing demand. This is true only in very dry years but can be mitigated with excess capacity in the drinking water system.

Santaquin City's water budget analysis shows that while the current water supply and infrastructure are adequate for today's needs, future water demand is expected to exceed supply. This projected gap emphasizes the importance of taking proactive steps now to manage water use and ensure the long-term sustainability of Santaquin's water systems. The following section highlights how the City is addressing these future challenges through water conservation efforts.

Water Supply Diversification

Santaquin maintains a diverse supply of water sources that includes springs, groundwater wells, surface water, and Type I effluent reuse. Santaquin is planning to further diversify their water supply by connecting to the Central Utah Water Conservancy District (CUWCD) Utah Lake System (ULS) pipeline. The ULS pipeline will provide an additional source of irrigation water, freeing up groundwater for use in the drinking water system.

Methods of Reducing Water Demand and Per Capita Use for Existing Development

Santaquin has adopted several practices that reduce water use among existing customers:

- **Public Education & Outreach**
  The City's Water Education Program uses utility bills, the City Center, Public Works, and online platforms to regularly share conservation tips. Educational efforts are tailored to both average and high-volume water users.

- **Tiered Water Pricing**
  Water rates are structured to encourage conservation. Higher usage results in higher pricing tiers for both culinary and pressurized irrigation, providing a financial incentive to reduce consumption.

- **Metering and Leak Detection**
  Santaquin has invested in replacing aging meters with radio-equipped smart meters that help residents monitor their water use in real time. Meters have also been added to public facilities to increase accountability, and a formal leak detection program ensures aging infrastructure is monitored and maintained.

- **Effluent Reuse**
  Treated wastewater (type-I effluent) is stored in holding ponds and used in the City's pressurized irrigation system. While this doesn't reduce demand directly, it allows the City to meet irrigation needs without developing new water sources.

Methods of Reducing Water Demand and Per Capita Use for Future Development
To ensure future development is water-efficient, Santaquin has adopted and recommended the following policies and standards:

- **Landscape Efficiency Standards for New Development**
  Ordinance No. 02-03-2024 requires water-wise landscaping in new development, including:
  - Turf limitations
  - Prohibiting turf in narrow areas
  - Use of drought-tolerant or native plants
  - Drip irrigation systems for shrubs and trees
  - Smart irrigation controllers
  - Eligibility for landscape rebate/incentive programs

- **Allocation-Based Tiered Pricing Models (Recommended)**
  Santaquin is exploring pricing structures that base water rates on lot size and expected usage, following models adopted in cities like Saratoga Springs.

- **HOA Landscaping Flexibility**
  The City recommends that homeowners' associations (HOAs) allow for water-efficient landscaping designs and turf dormancy, removing barriers that often exist in traditional HOA codes.

- **Tree Placement Standards**
  The City encourages planting deciduous trees on the south, east, and west sides of buildings, and evergreen trees on the north side to reduce water needs and improve energy efficiency.

Modifications to City Operations to Reduce and Eliminate Wasteful Practices
Several operational changes have been made—or are under review—to improve efficiency:

- **Time-of-Day Watering Restrictions**
  Santaquin encourages customers to avoid daytime watering (from 10 a.m. to 6 p.m.) to reduce evaporation and increase efficiency.

- **Irrigation Audits**
  Audits of public irrigation systems are being carried out to assess efficiency and identify upgrade opportunities, particularly in streetscapes and public parks.

- **Internal Metering and Monitoring**
  Installing meters at City facilities has helped monitor municipal water use and identify opportunities for internal conservation.

Future Planning Recommendations on Conservation Policy
To further strengthen Santaquin's water management strategy, the City will consider the following policies and ordinance changes:

- **Water Conservation Policies:**
  - Expansion of landscape rebate/incentive programs
  - Continued investment in smart meters and leak detection
  - Adoption of allocation-based rate structures
  - Ongoing updates to public education campaigns

- **Landscaping Options Within Public Streets (Non-Turf Park Strips):**
  - Require water-wise planting or hardscape design in park strips
  - Prohibit turf in non-functional areas
  - Prioritize low-maintenance materials and drip irrigation

- **Ordinance Revisions to Eliminate Inefficient Water Use:**
  - Remove overly permissive irrigation allowances
  - Encourage clustering in subdivision design and preservation of natural open space to reduce irrigated area per lot
  - Require functional justification for size of irrigated landscape in commercial zones

- **Low Water Use Landscaping Standards for New Development Types:**

  - Commercial, Industrial, and Institutional: Require drought-tolerant planting, smart irrigation, and minimal turf in non-functional areas
  - Residential: Require compliance with landscaping standards, turf limitations, and irrigation efficiency technologies as part of development approval

Impact on the Great Salt Lake

Santaquin is working to reduce impacts on the GSL by reducing depletion in the system. Outdoor water demands have a high depletion rate, as most of the water evaporates or is consumed by turfgrass. Reducing outdoor water demands provides an excellent opportunity for mitigating impacts to the GSL. Existing conservation programs can reduce existing outdoor demands and recently adopted ordnances will help reduce the addition of more outdoor demands.