

Thornton, CO

Commercial Water Use Benchmark Development

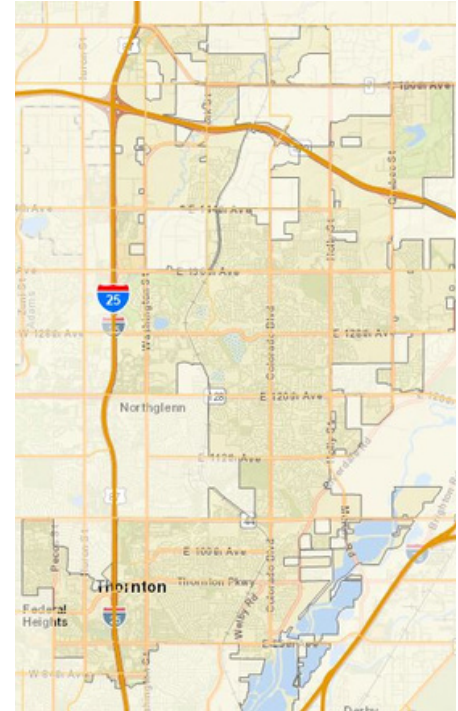


Project at-a-Glance

Community Overview

- Utility/Community: City of Thornton
- Location: Thornton, CO
- Population served: 165,000
- Service area: 39 square miles

Project Partners



Project Benefits

- Informs water conservation goals and equitable tap fees for CII properties, allowing Thornton to reduce municipal water use, supporting the City's Water Efficiency Plan implementation.
- Enables the City of Thornton to better track and forecast water demand within CII categories.
- Allows Thornton to understand and predict low, average, and high water use across 14 different CII categories.

Project Challenges



Equity and Affordability



Drought



Changing Population



Climate Change

Project Objective

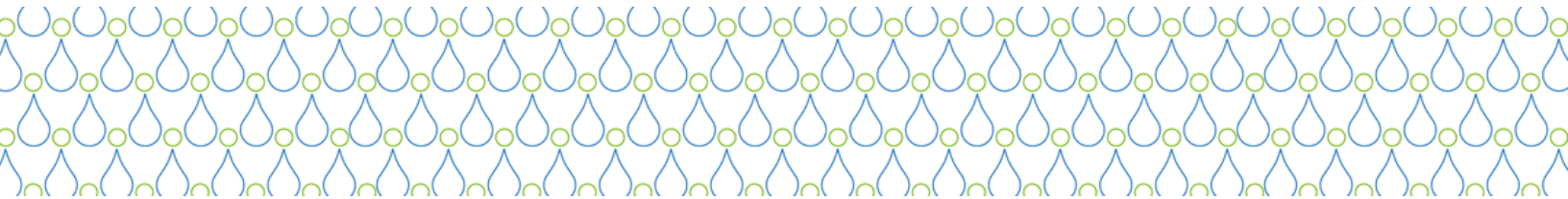
Identify appropriate water use benchmarks for Thornton’s commercial, industrial, and institutional (CII) customers.

Project Results

Indoor water use benchmarks for 14 CII categories and guidance on implementing these benchmarks to achieve city-wide water savings.

Strategies for Success

- WaterNow developed indoor water use benchmarks for the City of Thornton’s CII customers through the following strategies:
 - Reviewing water consumption and land use data to quantify how water is used by CII property types (e.g., car washes, retail outlets, gas stations, etc.) in the service area throughout 2022.
 - Analyzing water use trends for these CII categories to create indoor water use benchmarks and further refining these benchmarks by creating subcategorizations based on observed trends in water use between different properties within these initial categories (e.g., separating preschools from the wider Schools category).
 - Engaging CII property owners/managers to refine the proposed benchmarks in the context of their existing water conservation measures.
 - Providing guidance on ways to continue refining benchmark data and how to implement benchmarks for a more equitable and efficient approach to water use and billing among CII properties.





Project Spotlight

Thornton, CO is home to approximately 148,000 people living in Colorado's Front Range, with a drinking water service area population of 165,000. Currently, the City's utility billing database does not distinguish between business types within the commercial customer class, making it challenging to determine water use trends for different business categories and to project future water demand.

The main objective of this project was to determine appropriate water use benchmarks for CII customers by business type as a foundation for establishing new CII water conservation goals and developing a more equitable tap fee structure. The project team implemented this project through the following phases:

Phases 1 and 2: WaterNow Alliance researched and spoke with communities across the West who had established CII benchmark programs to gauge benchmark development methodologies as well as the impact, if any, that these programs have had to date. The team also conducted a tailored analysis of Thornton's water use data to quantify CII water use by business type in the city. This information served as the foundation for developing draft water use metrics and benchmarks for each primary CII category intended to reduce overall CII consumption (See the [Methodology Explainer](#) for a detailed explanation of the benchmark analysis approach).

Phases 3 and 4: In order to "ground-truth" the proposed benchmarks, the project team held stakeholder meetings with CII water users to share information on the benchmark development process and gather feedback. These discussions led to two case studies showcasing the water use and current and recommended water efficiency practices of [Adams 12 Five Star Schools](#) and [Thornton City Buildings](#). Based on these conversations and detailed review of water use trends within each CII category, the project team realized some categories needed to be subcategorized to better reflect the varied water use patterns among CII users and refine the benchmarks. (see Table 1 below for the final CII categories used to develop the refined benchmarks). Finally, as described in detail below, WaterNow developed guidance to support the City's implementation efforts and ensure the project's results are actionable now and in the future.

Table 1. CII Categories

Animal Clinic	Mixed Use
Auto Services	Multifamily Residential
Bank	Office
Car Wash	Pre-K/Daycare
City Building	Public Recreation
Eating/Drinking Place	Public Safety
Gas Station	Religious Institution
Healthcare Facility	Retail Outlet
Hotel/Motel	School/College
Light Industrial	Senior Living
Mini Storage	Service-oriented Shopping



Project Impacts

WaterNow developed water use benchmarks for 14 CII categories, providing Thornton with a basis for developing water conservation goals and equitable taps fees. To support implementation of the benchmarks and realization of these goals, WaterNow developed guidance on the following topics:

- **Developing water conservation goals:** The CII benchmarks include 25th, 50th, and 75th percentile water usage rates for each CII customer category, allowing Thornton to base water conservation goals off these numbers. WaterNow also provided Thornton with a list of CII properties with water use above the 75th percentile (“High Water Users”), to support the City’s targeted water conservation outreach to these properties.
- **Developing equitable tap fees:** WaterNow outlined the steps Thornton should take to create a comprehensive fee structure that reflects both infrastructure needs and actual water consumption of each CII customer

- **Methodology for future iterations:** The project team provided guidance on how to update these benchmarks in the future, including how to incorporate additional years of data, recommendations for verifying parcel classifications, and advice on assessing use rates for mixed-use parcels.
- **Resources and Educational Materials on CII benchmark implementation:** WaterNow highlighted resources for more information on implementing CII benchmarks as well as examples for communicating benchmarks to customers and best practices for customers to meet the benchmarks.

The process undertaken with Thornton to craft CII water use benchmarks can be replicated and scaled in many communities nationwide and particularly in the Colorado basin. To this end, WaterNow developed a [Methodology Explainer](#) outlining the steps the project team took to create indoor water use benchmarks for CII properties, providing an overview of the process for other cities looking to adopt similar programs either on their own or with WaterNow or other assistance.

Key CII Benchmarking Resources

CII Customer Classification and Water Use Metrics and Benchmarking Development:

- The State of California's [Recommendations for Commercial, Industrial, and Institutional Water Use Best Management Practices Performance Measure](#)
- California Water Efficiency Partnership's forthcoming [CII Customer Classification Guide](#)
- [Methodology for Evaluating Water in the Commercial, Institutional, and Industrial Sectors](#) (Kiefer, Krentz, and Dziegielewski, 2015)
- [Developing Water Use Metrics in the Commercial and Institutional Sector](#) (Fedak et. al., 2019)
- [Water Use Analysis Guide for Commercial and Institutional Efficiency](#) (Volckens et. al., 2019)
- [Benchmarking Task Force Collaboration for Industrial, Commercial & Institutional \(ICI\) Water Conservation](#) (Brendle Group, 2007)

Customer Education and Outreach:

- Western Resource Advocates' "[A Guide to Designing Conservation-Oriented Water System Development Charges](#)"
- East Bay Municipal Utility District (EBMUD) [WaterSmart Guidebook: A Water Use Efficiency Plan and Review Guide for New Businesses](#)
- The Environmental Protection Agency's [Tools for CI Facilities web page](#).

(See the [Methodology Explainer](#) for additional resources)



Lessons Learned

The project team identified several key lessons learned for communities embarking on similar CII water use benchmarking efforts:

1. The CII benchmarking process can be an opportunity to update customer account information and combine this with other data, such as spatial land use data, to inform the development of other water conservation measures, such as water budgets.
2. Mixed use parcels pose particular challenges in the benchmarking process. Parcels with multiple meters for different businesses, or multiple business types sharing a single meter, do not fit neatly into one CII benchmarking category since each property type will have a different water use rate. To address these challenges, mixed-use meters can be assigned to their highest-using category, or they could be assessed using a blended mix of benchmarks rate for the categories of user present on the parcel.
3. It is helpful to speak with CII properties throughout this process to understand the factors influencing their water use. These conversations are also an opportunity to communicate the value of benchmarks to CII customers and share information about the resources available to support CII customers in reaching these benchmarks.
4. It is important to determine a plan for organizing and updating data in the future. Water use patterns will change as CII properties change and new CII development occurs so deciding how to address these changes early on will make them easier to integrate.