City of Louisville
COLORADO • SINCE 1878

# City Council

## *Study Session*

## *Agenda*

**Tuesday, October 8, 2024**
**Library Meeting Room**
**951 Spruce Street**
**6:00 PM**

*Members of the public are welcome to attend remotely; however, the in-person meeting may continue even if technology issues prevent remote participation.*

- *You can call in to +1 719 359 4580 or 877 853 5247 (toll free)*
  *Webinar ID #876 9127 0986.*
- *You can log in via your computer. Please visit the City's website here to link to the meeting: www.louisvilleco.gov/council*

*Anyone may email comments to the Council prior to the meeting at Council@LouisvilleCO.gov.*

1. Call to Order & Roll Call
2. Utilities - Water 101
3. Adjourn

**Citizen Information**

If you wish to speak at the City Council meeting in person, please fill out a sign-up card and present it to the City Clerk at the meeting; if you are attending remotely, please use the "raise hand" icon to show you wish to speak in public comments.

Persons planning to attend the meeting who need sign language interpretation, translation services, assisted listening systems, Braille, taped material, or special transportation, should contact the City Clerk's Office (303.335.4536 or 303.335.4574) or ClerksOffice@LouisvilleCO.gov. A forty-eight-hour notice is requested.

Si requiere una copia en español de esta publicación o necesita un intérprete durante la reunión del Consejo, por favor llame a la Ciudad al 303.335.4536 o 303.335.4574 o email ClerksOffice@LouisvilleCO.gov.

City of Louisville
COLORADO • SINCE 1878

# CITY COUNCIL COMMUNICATION
## AGENDA ITEM 2

**SUBJECT:** **PRESENTATION: UTILITIES – WATER 101**

**DATE:** **OCTOBER 8, 2024**

**PRESENTED BY:** **KURT KOWAR, DIRECTOR OF PUBLIC WORKS**
**CORY PETERSON, DEPUTY DIRECTOR OF UTILITIES**

**SUMMARY:**
This presentation provides an educational overview of the City's water sources and acquisition, water treatment facilities, water conservation impacts, climate impacts, water usage, water revenue, and the amazing staff that provides clean water to the residents of Louisville.

**FISCAL IMPACT:**
N/A – Informational Item Only

**PROGRAM/SUB-PROGRAM IMPACT:**
N/A – Informational Item Only

**STAFF RECOMMENDATION:**
This is an informational item for Council. Staff will be available to answer any questions.

**ATTACHMENT(S):**
**1)** Utilities – Water 101 Presentation

**STRATEGIC PLAN IMPACT:**

| | | | |
|---|---|---|---|
| ☒ | **Financial Stewardship & Asset Management** | ☒ | **Reliable Core Services** |
| ☐ | **Vibrant Economic Climate** | ☐ | **Quality Programs & Amenities** |
| ☐ | **Engaged Community** | ☐ | **Healthy Workforce** |
| ☐ | **Supportive Technology** | ☐ | **Collaborative Regional Partner** |

# Utilities - Water 101

October 8, 2024

City of Louisville
COLORADO • SINCE 1878

People

Water Treatment
Operations
Engineering
Administration

People | Water and Operations Staff

| Level | Expected Level of Responsibility | Years of Experience | Core Certifications and Skills (All Required) | Elective Certifications and Skills (Requires Any 2 per Level) |
|---|---|---|---|---|
| Operations Technician I | • Learn the very basics in Operations<br>• Familiarize self with equipment & procedures.<br>• Perform job duties as assigned. | 0-1 | • CDL (B)<br>• Flagger Certification<br>• Trench & Shoring Safety Certification<br>• First Aid, CPR, AED Certified | • Beginning Excel Course<br>• Intermediate Excel Course<br>• Advanced Excel Course<br><br>• Beginning Word Class<br>• Intermediate Word Class<br>• Advanced Word Class<br><br>• Beginning Powerpoint Class<br>• Intermediate Powerpoint Class<br>• Advanced Powerpoint Class<br><br>• Typing Class<br><br>• Attend a KICP-Keep It Clean Seminar<br>• KICP Certificate<br><br>• Attend a Water or Collections Seminar<br>• Attend a Leadership Class<br>• Attend a Water, Collections, Asphalt, or Snow & Ice Conference.<br><br>• Stormwater Inspector<br>• Backflow - Cross Connection Certification<br>• Welding Certificate<br>• Customer Service Class<br>• Budgeting Class<br><br>• Other Classes as Approved |
| Operations Technician II | • Basic understanding of Operations with a higher skill set and the ability to report any special considerations.<br>• Proficient in equipment usage of backhoe/loader/vactor/jetter/sweeper/bobcat. | 1-2 | Prerequisite for Tech II:<br>• Distribution I Certification<br>• Collections I Certification<br>• Traffic Control Technician<br>• Confined Space Entry Training<br>• Conflict Management Class<br>• Exceeds Job Requirements on Performance Review | |
| Operations Technician III | • Knowledge of all facets of Operations.<br>• Step up technically and act as lead in absence of Tech IV.<br>• Make suggestions on preventative maintenance & help determine repair methods.<br>• Above proficient in equipment usage, back hoe/loader/vactor/jetter/bobcat. | 2-4 | Prerequisite for Tech III:<br>• Distribution II and III Certifications<br>• Collections II and III Certifications<br>• Traffic Control Supervisor<br>• Trench Safety Supervisor<br>• Stormwater Inspector Training<br>• Buddy to Supervisor Class | |
| Operations Technician IV | • Crew lead in field.<br>• Stress importance of safety & training.<br>• Give technical suggestions to Asst. Ops Manager.<br>• Assist in inventory & ordering of supplies.<br>• Lucity & Munis competent. | 4+ | Prerequisite for Tech IV:<br>• Distribution IV Certifications<br>• Collections IV Certifications<br>• Confined Space Supervisor<br>• Traffic Control Supervisor<br>• Trench Safety Supervisor<br>• Supervisory Class | |

People | Staff Development

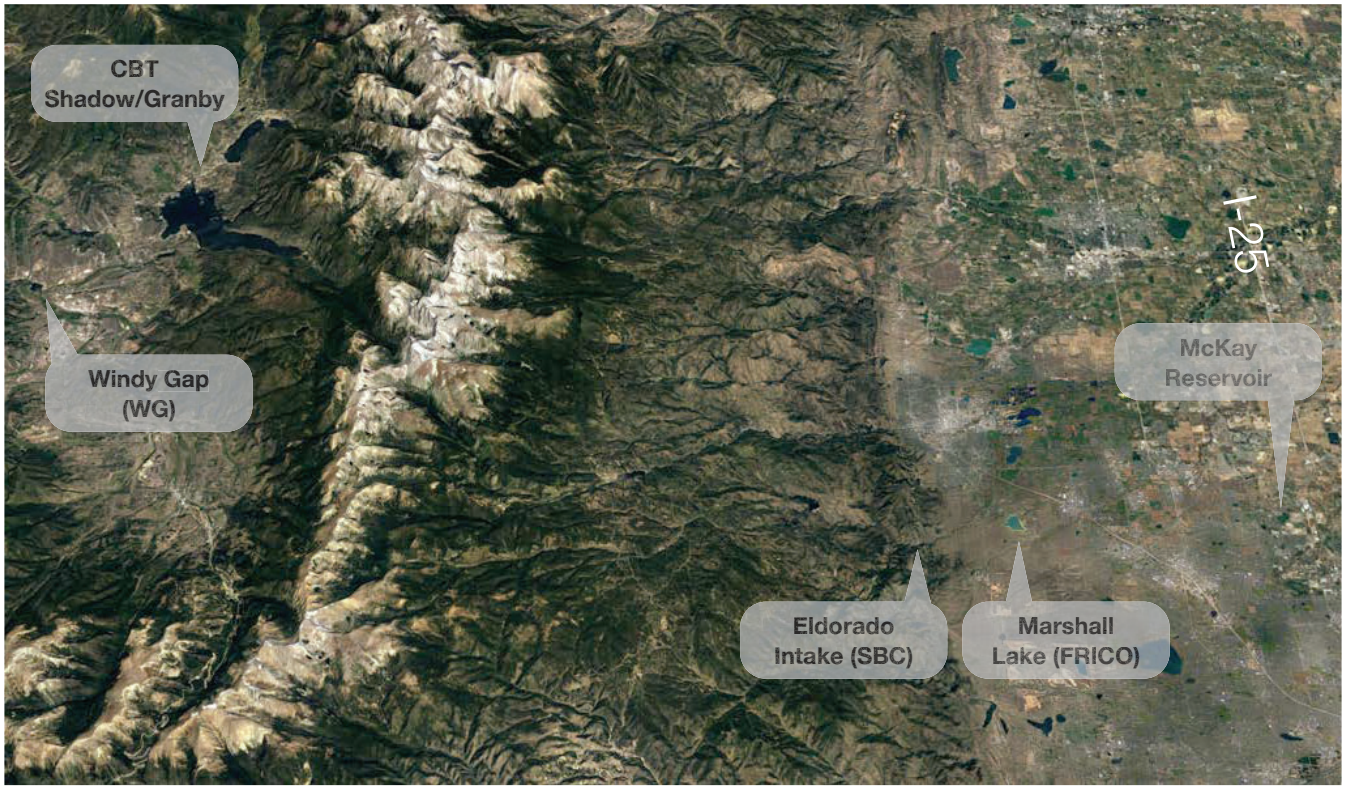
# 2024 Utility Master Plan

Evaluation of Current and Future Regulatory Impacts

Analysis of Existing and Future Conditions for Demand and Capacity.

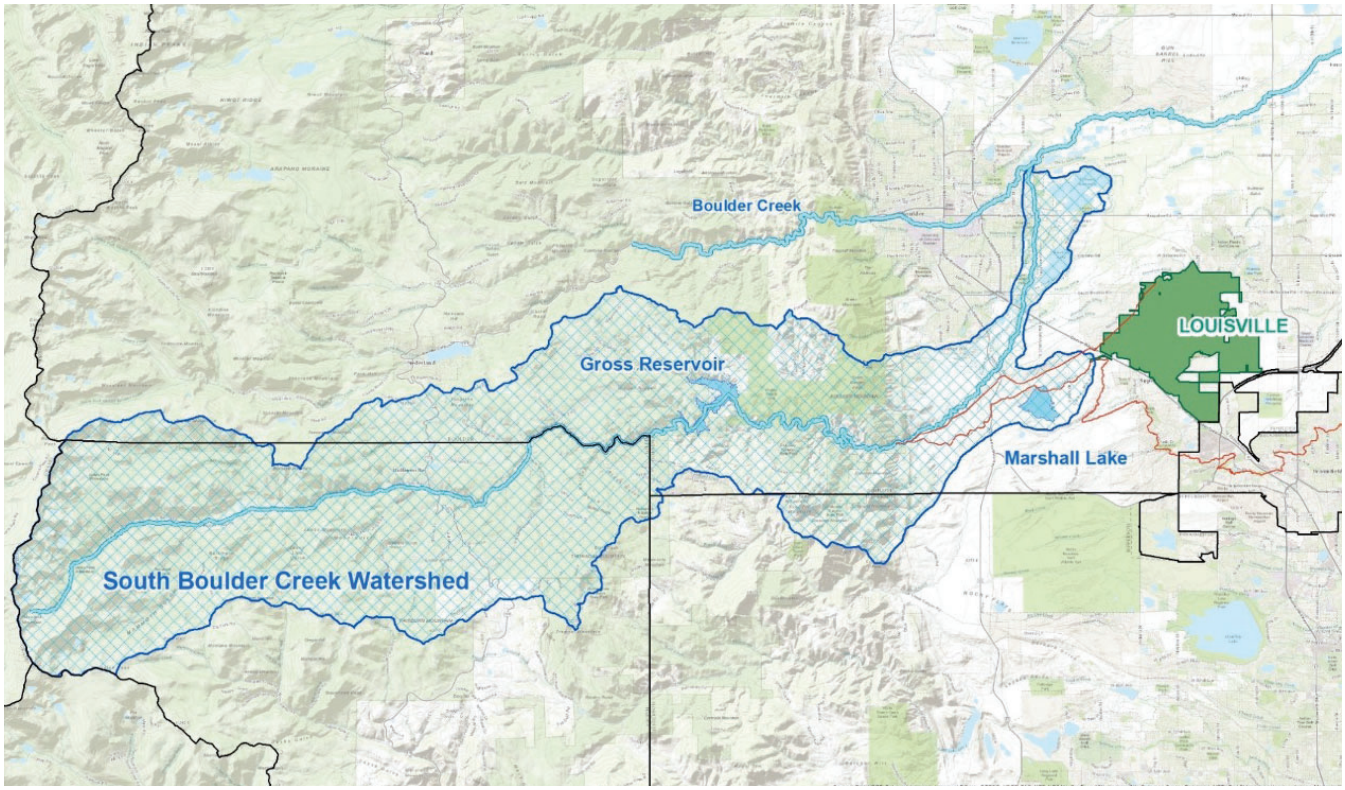
Asset Risk and Criticality Review

Long Term Capital Improvement Project Plan Review and Update

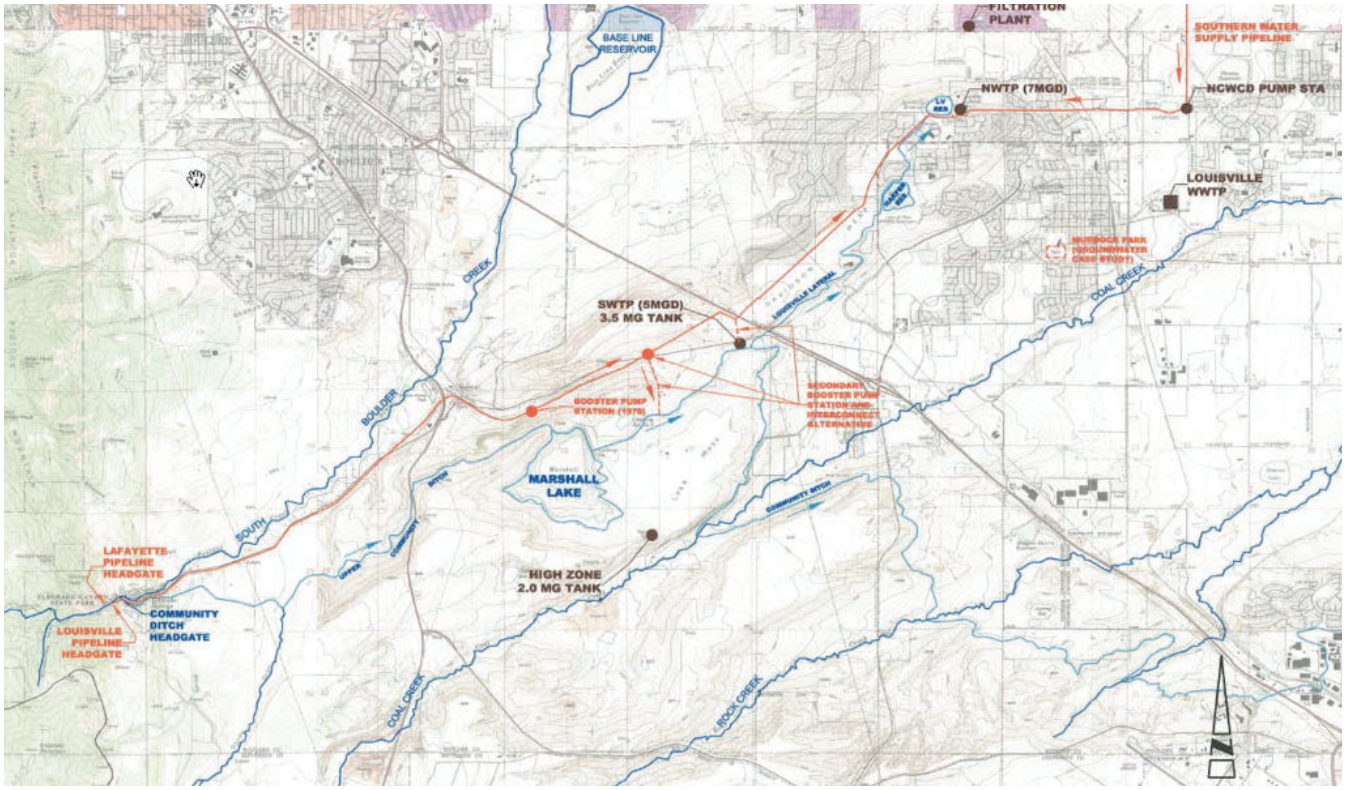

## The Global Perspective

Two River Basins
East Slope (SBC)
West Slope (CBT/WG)




South Boulder Creek | Watershed

Eldorado Canyon Intake | South Boulder Creek



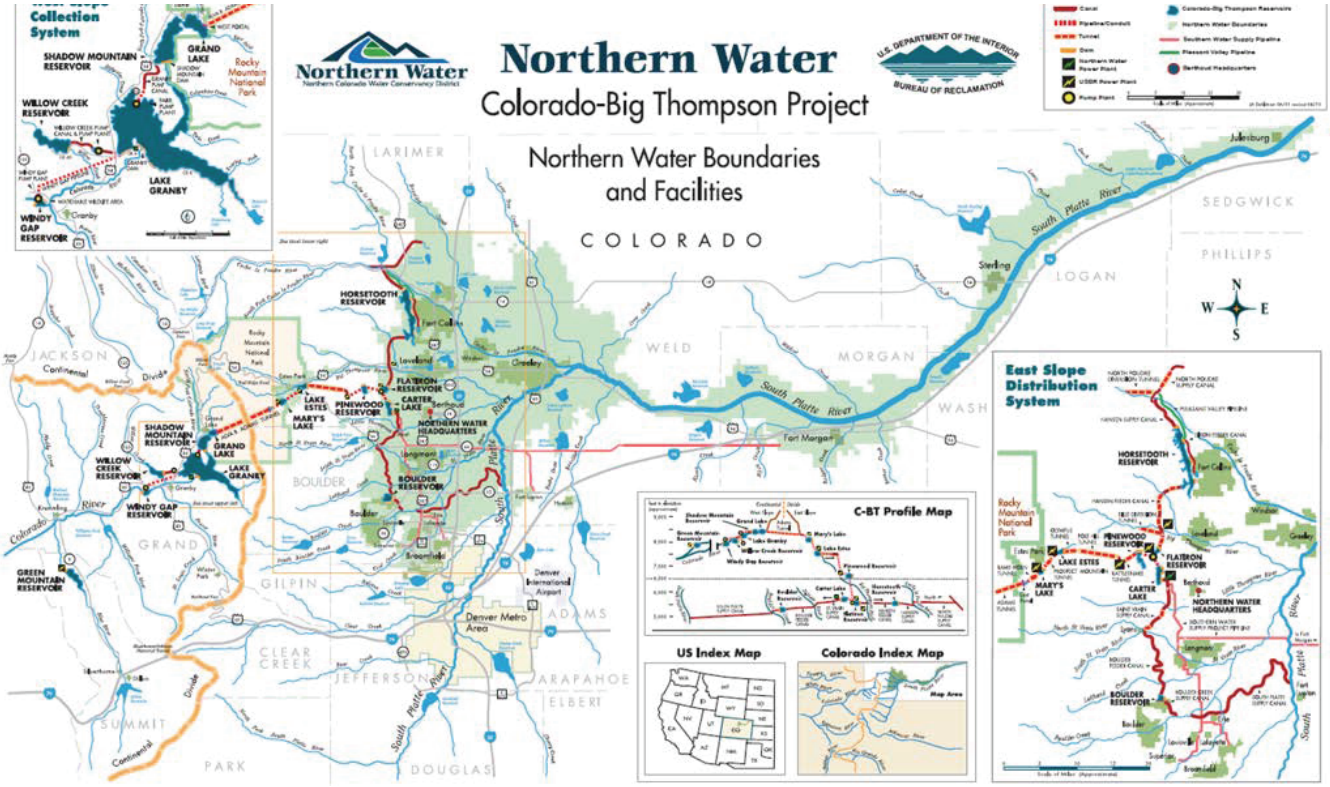

## South Boulder Creek (Direct)
## Marshall Lake (FRICO)

Primary Supply ~ 3,800 ac-ft (Firm)
44 Different Rights
13 Different Ditch Companies




## McKay to Big Dry Creek Return Flows

Collaboration (Westminster)




# Colorado Big Thompson Windy Gap

Secondary Supply
CBT (Dry) ~ 1,240 ac-ft (Firm)
WG (Wet) ~ 2,835 ac-ft (Storage)
WG (Wet) ~ 600 ac-ft (Firmed)



## Chimney Hollow

$670 Million Project

$18.50 Million Louisville Share

Provides 600 AF of Firm Yield

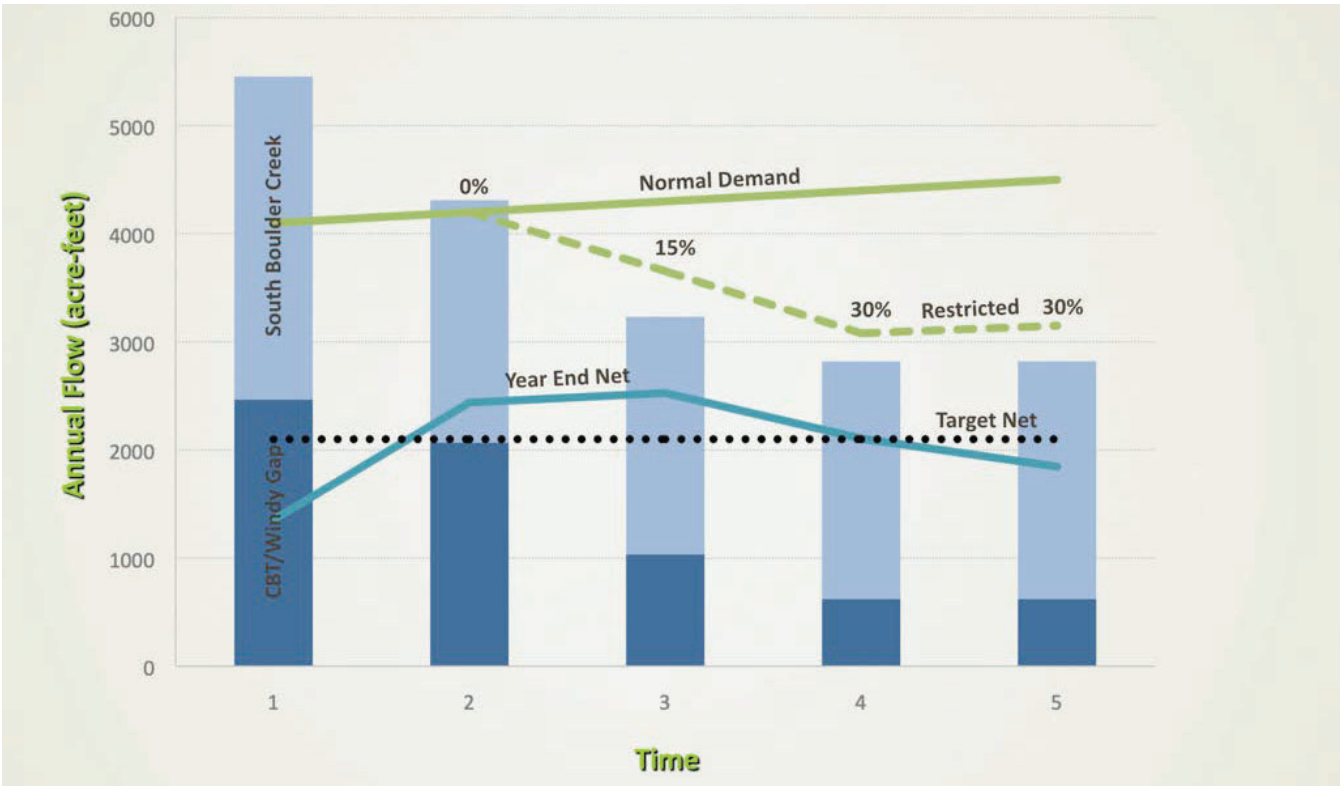
Forecasted to be Online 2028/2029

Chimney Hollow and Colorado River Connectivity Channel
Construction Progress - Fully Operational by 2029

# Water Planning

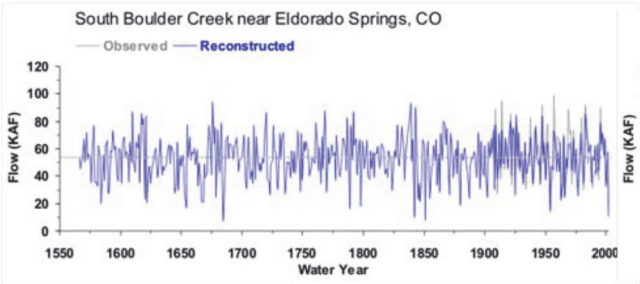
- **1979** Comprehensive Water System Planning Report
- **1989** Water Distribution System Study Update
- **1992** Raw Water Master Plan
- **1998** Raw Water Master Plan Update
- **2003** Raw Water Master Plan Update
- **2012** Water Infrastructure Master Plan
- **2013** Drought Management Plan
- **2015** Water Efficiency Plan
- **2016** Raw Water Master Plan
- **2024** Utility Master Plan

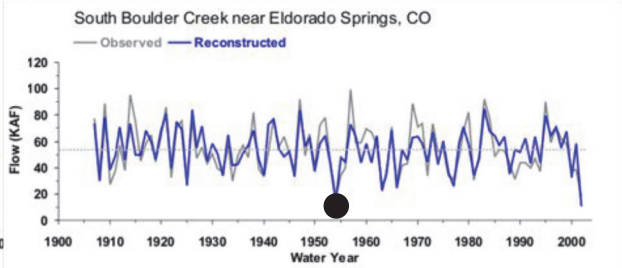



# Drought

US Drought Monitor
Snow Pack ~ Water Supply Demands
Windy Gap Firming Critical




# Drought Planning

## Tree Ring Data

## Climate Change

- **Winter** Precip Increase 10-20%
- **Summer** Precip Decrease 5-15%
- **Late Summer** Stream Flows Decrease 8-10%
- **Irrigation** Demands Increase 5-15%
- **Reservoir** Evaporative Losses Increase
- **Weather** Extremes Increase
- **Storage** becomes more important.
- **Outdoor Watering** Efficiency becomes more important.

**Figure 3**
Potential Runoff Timing Shift

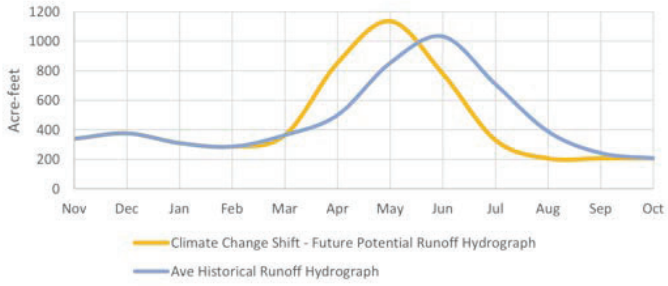
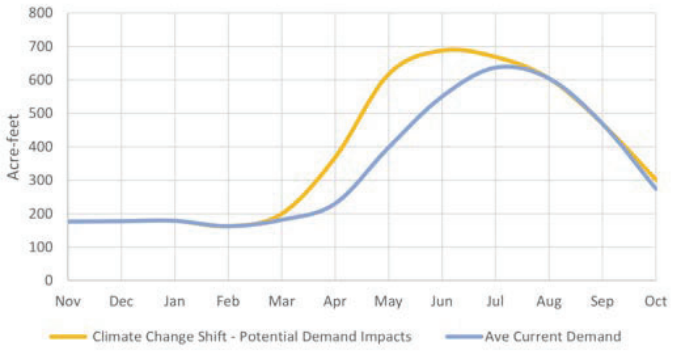



**Figure 4**
Potential City Demand Shift



*At-A-Glance*

# 2023 Cumulative Impact

### GARDEN IN A BOX

- **39** water providers
- **7,746** community members
- **11,554** waterwise gardens sold
- **10,200,000** gallons of water saved*

### LAWN REPLACEMENT

- **23** water providers
- **604** community members
- **329,213** sq. ft. of lawn removed
- **3,900,000** gallons of water saved*

### SLOW THE FLOW

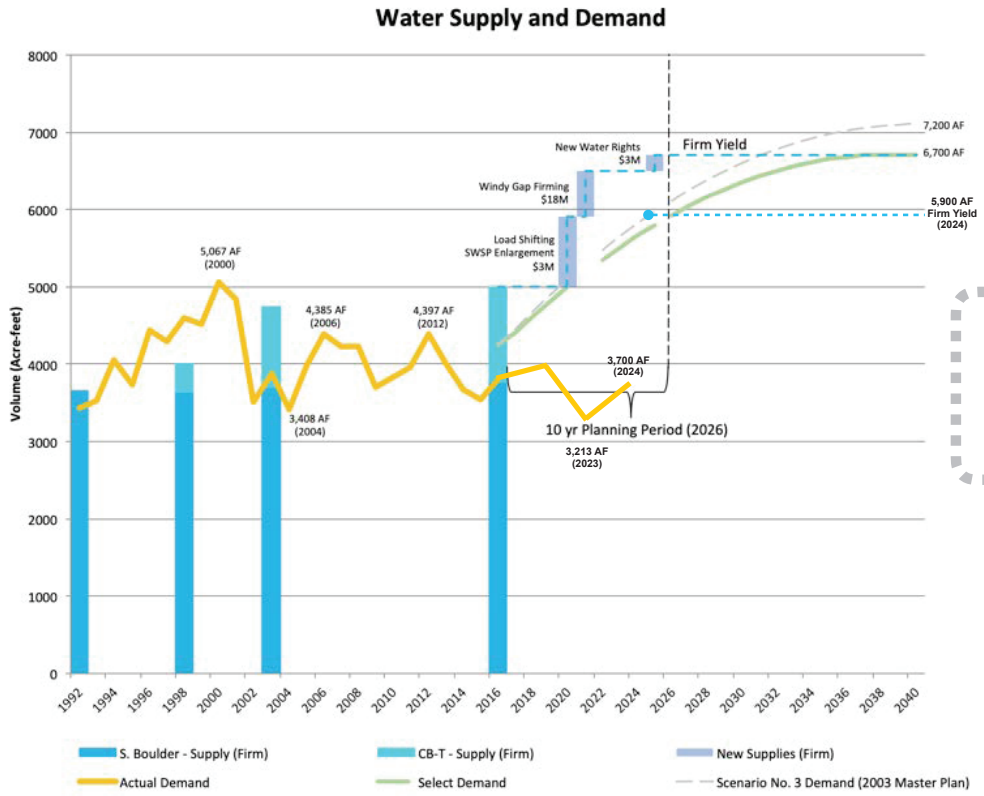
- **33** water providers
- **2,231** residential properties
- **48** non-residential properties
- **11,200,000** gallons of water saved*

### WATERWISE YARD SEMINARS

- **16** water providers
- **3,415** community members
- **25** waterwise webinars

*Estimated water savings in 2023.

## Water Conservation | Resource Central




Scenario 1
**2015 Water Efficiency Plan**
6,100 ac-ft

Scenario 2
**2013/2016 Drought Management Modeling Reviews**
6,500 ac-ft

Scenario 3
**2003 Raw Water Master Plan Update**
7,120 ac-ft

## Raw Water Master Plan

**2024** Master Plan
**6,400** - **6,900** ac-ft

# Water Acquisition Considerations

1 ac-ft = 325,000 and supplies 2-3 homes (EQR)

| | SBC Basin | CBT/WG Basin |
|---|---|---|
| Delivery ($/ac-ft) | $0/ac-ft | $52 - 147 ac-ft |
| Storage | Marshall | CBT and WGF |
| Acquisition Cost ($/ac-ft) | $25,000 - $117,000 * | $108,000 |
| Water Court Risk | High | None |
| Administration | Complex | Simple |
| Return Flow Requirements | Yes | No |
| Reuse | No | CBT-No,WGF-Yes |
| Resale | Limited | Significant |
| Resilience | Limited | Significant |
| Threats | Fire, Landslide, Flood, Colorado Compact Call, Gross Reservoir | Fire, Colorado Compact Call |

* Dependent on watershed where shares are acquired, water court costs, and new infrastructure for return flows.

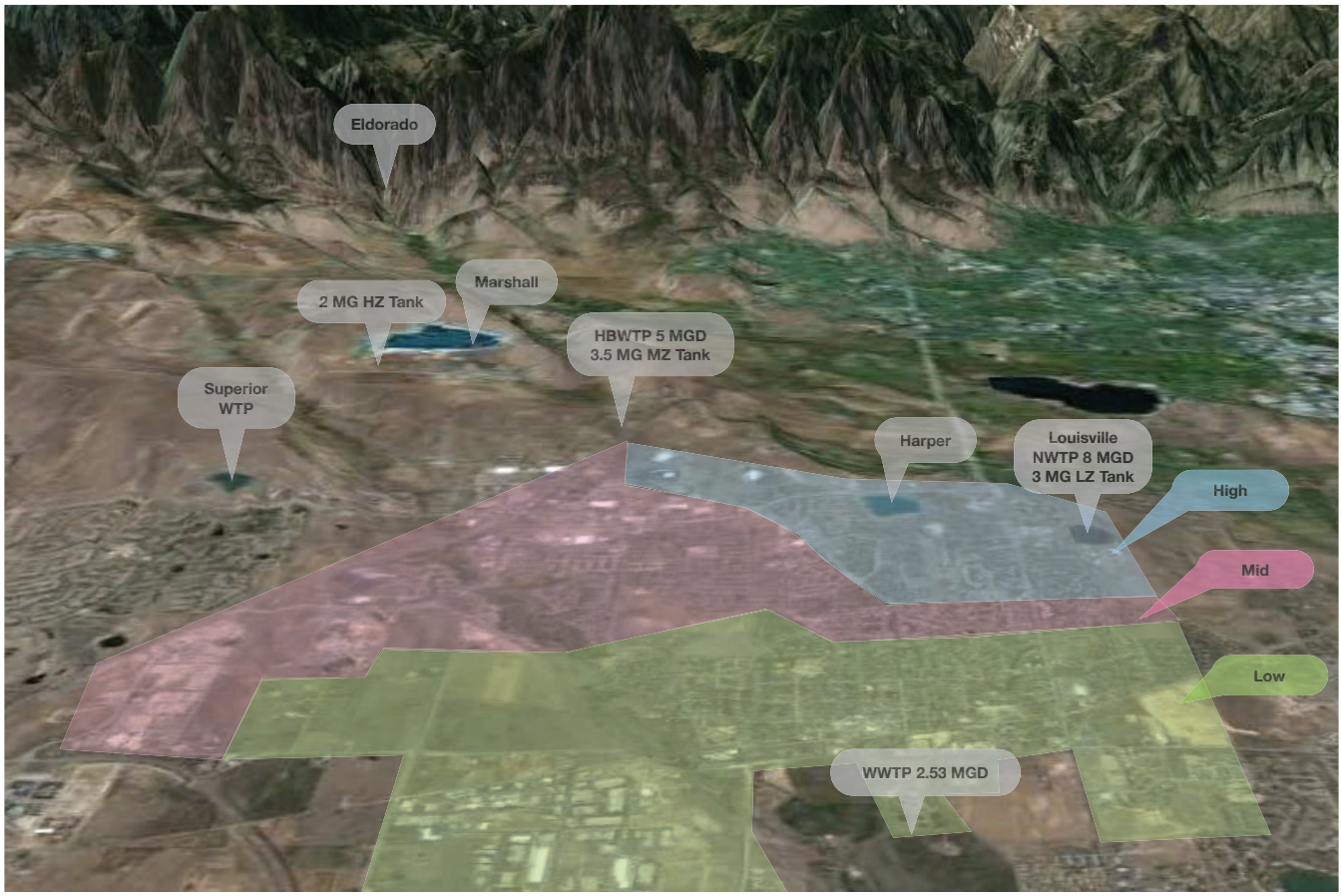


# **R**aw Water **I**ntegration **P**roject (RIP)

$5.9 Million

Adds 100 AF of Supply Synergy

Budgeted 2028/2029



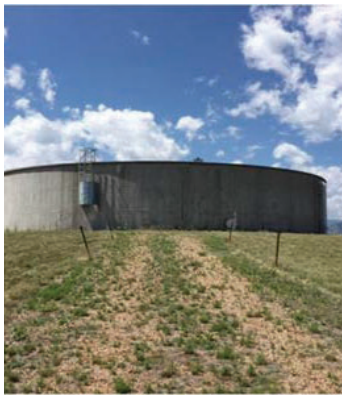

System Layout and Pressure Zones (Low, Mid, High)


Sid Copeland Water
(North) Treatment Facility

8 Million Gallons per Day
Built in 1985 (40 yrs)

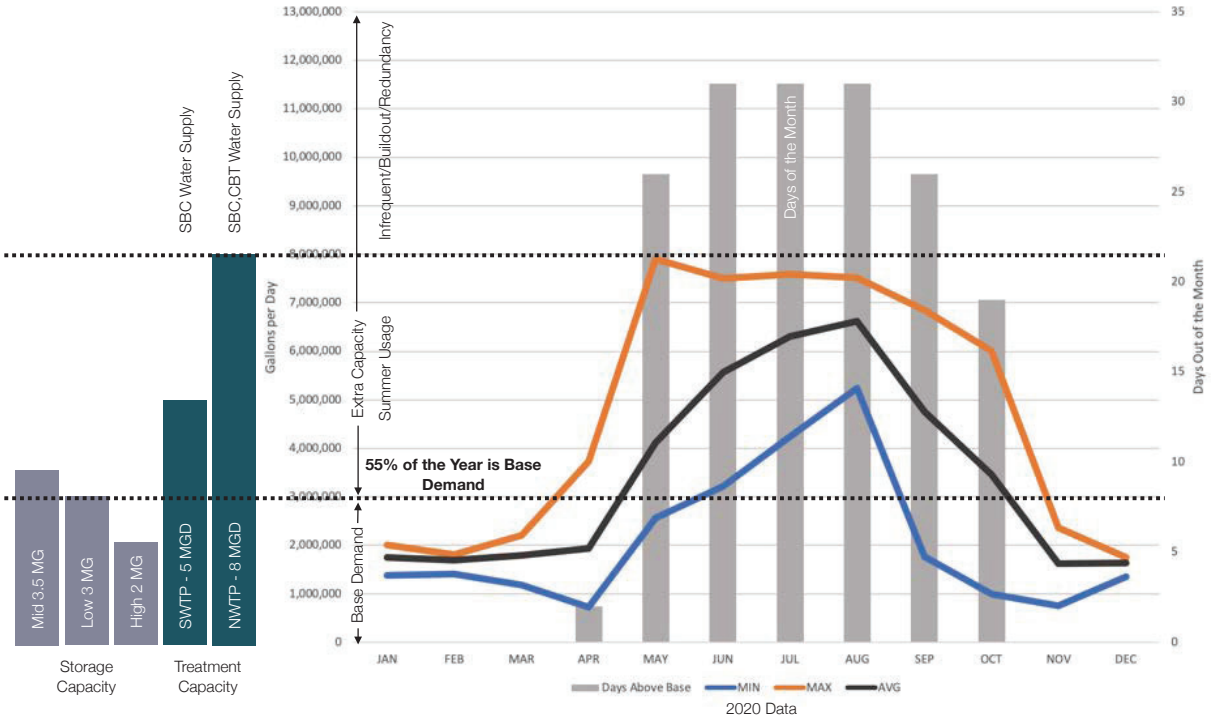

# Howard Berry Water (South) Treatment Facility

5 Million Gallons per Day
Built in 1993 (30+ yrs)

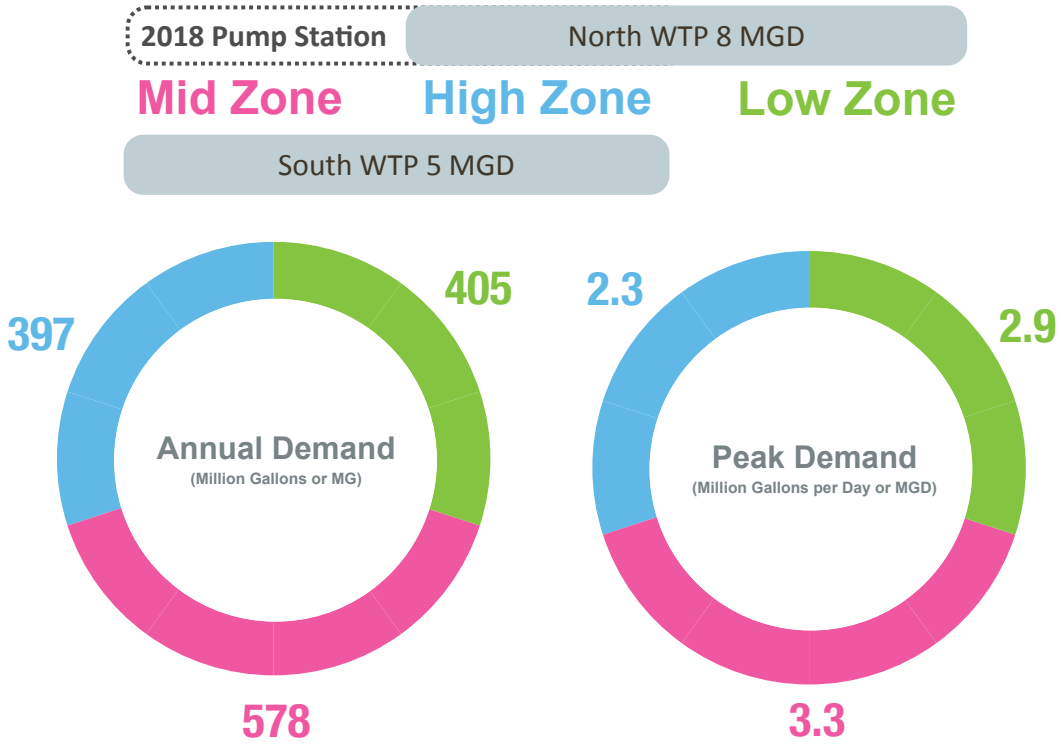


Various Facilities

# Water Treatment Production




# Zone Demand Management



# Distribution and Storage

Flush Hydrants (Water Quality)

Install and Repair Hydrants

Exercise Water Valves

Repair Water Breaks

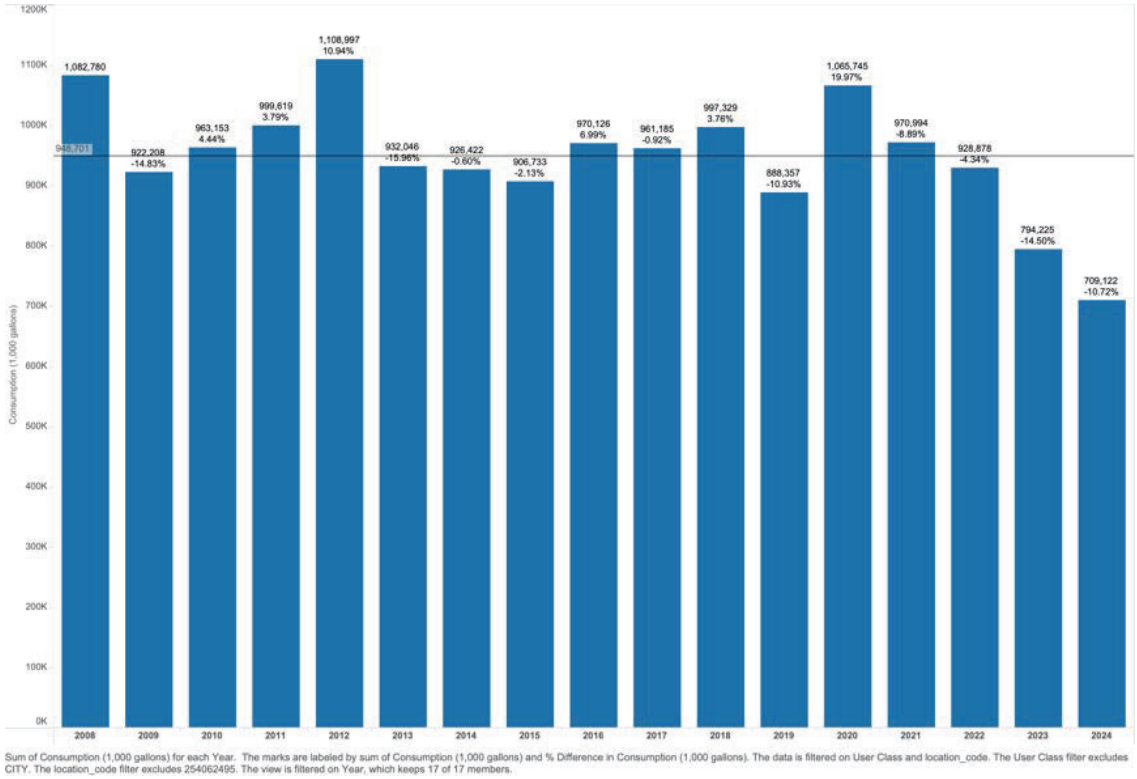
Install, Repair, Read Water Meters

Inspect, Repair, Maintain Storage Tanks

Backflow Prevention and Cross Connection Compliance

# Annual Total Water Usage Gallons

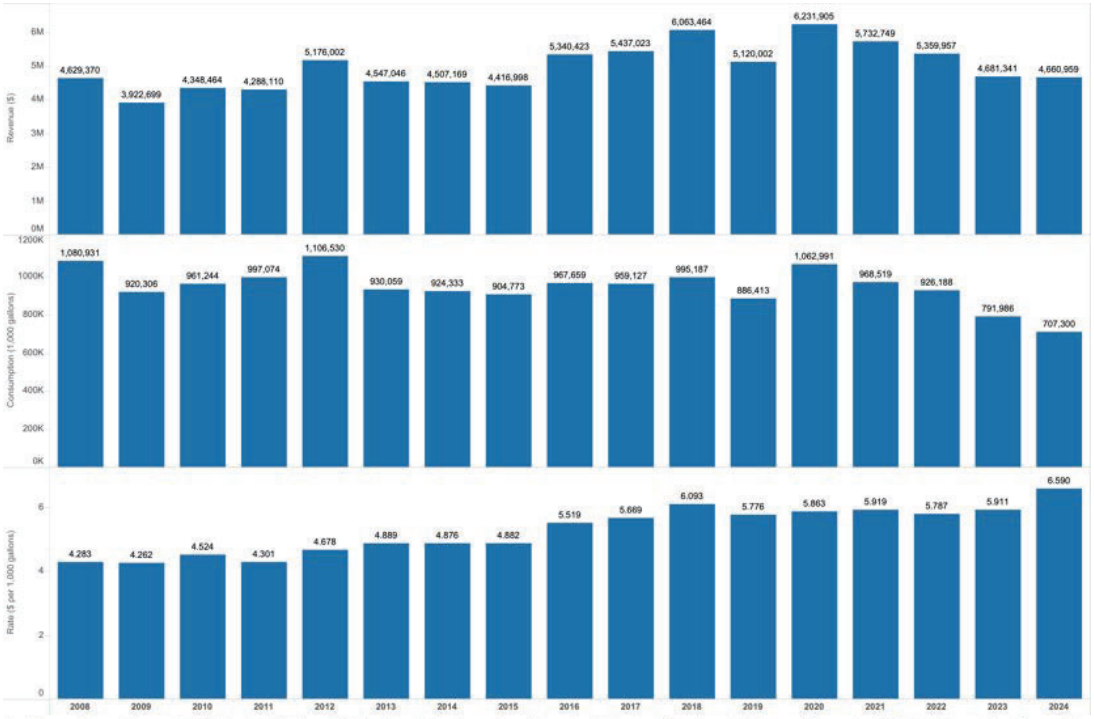
Year over Year % Change, 2024 Data Through August




Sum of Consumption (1,000 gallons) for each Year. The marks are labeled by sum of Consumption (1,000 gallons) and % Difference in Consumption (1,000 gallons). The data is filtered on User Class and location_code. The User Class filter excludes CITY. The location_code filter excludes 254062495. The view is filtered on Year, which keeps 17 of 17 members.

# Annual Total Revenue, Usage, $/Gallon

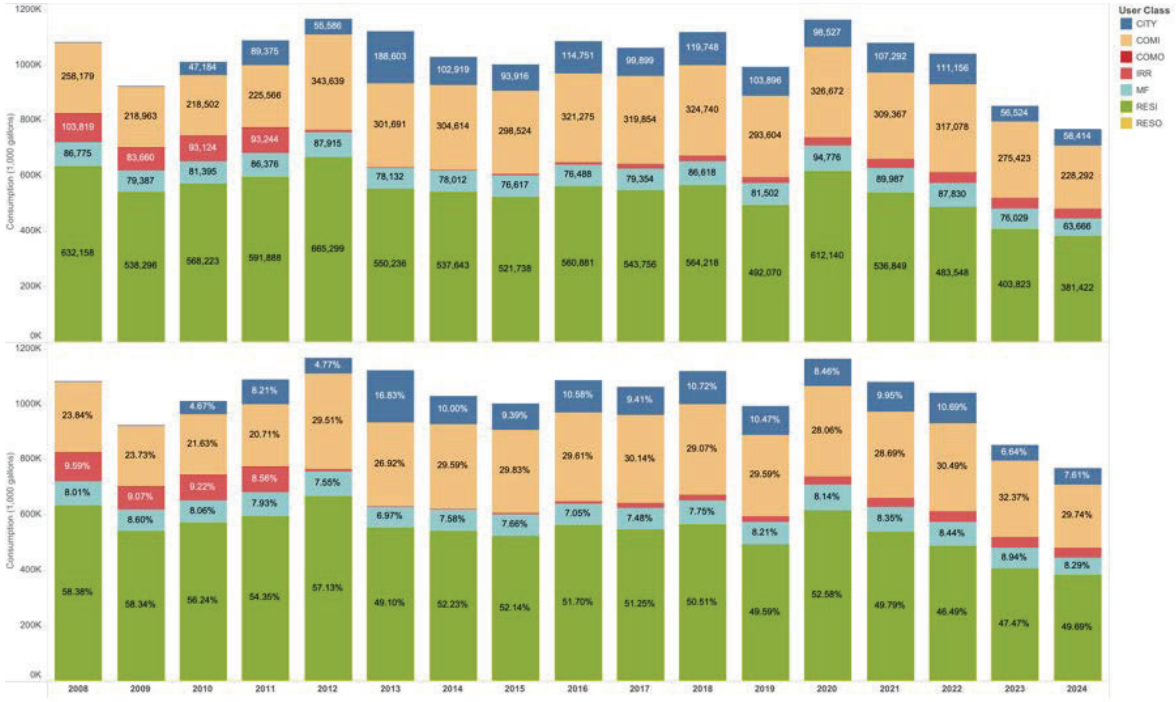
City Usage Revenue Not in Graphs (~$475,000), 2024 Data Through August




Sum of Revenue ($), sum of Consumption (1,000 gallons) and Rate ($ per 1,000 gallons) for each Year. For pane Sum of Consumption (1,000 gallons): The marks are labeled by sum of Consumption (1,000 gallons). For pane Sum of Revenue ($): The marks are labeled by sum of Revenue ($). For pane Rate ($ per 1,000 gallons): The marks are labeled by Rate ($ per 1,000 gallons). The data is filtered on User Class and location_code. The User Class filter keeps COMI, IRR, MF and RESI. The location_code filter excludes 254062495. The view is filtered on Year, which keeps 17 of 17 members.

# Annual Total Usage, % Usage by User Class

2024 Data Through August




Sum of Consumption (1,000 gallons) and sum of Consumption (1,000 gallons) for each Year. Color shows details about User Class. For pane Sum of Consumption (1,000 gallons): The marks are labeled by sum of Consumption (1,000 gallons). For pane Sum of Consumption (1,000 gallons) (2): The marks are labeled by % of Total Consumption (1,000 gallons). The data is filtered on location_code, which excludes 254062495. The view is filtered on User Class and Year. The User Class filter excludes . The Year filter keeps 17 of 17 members.

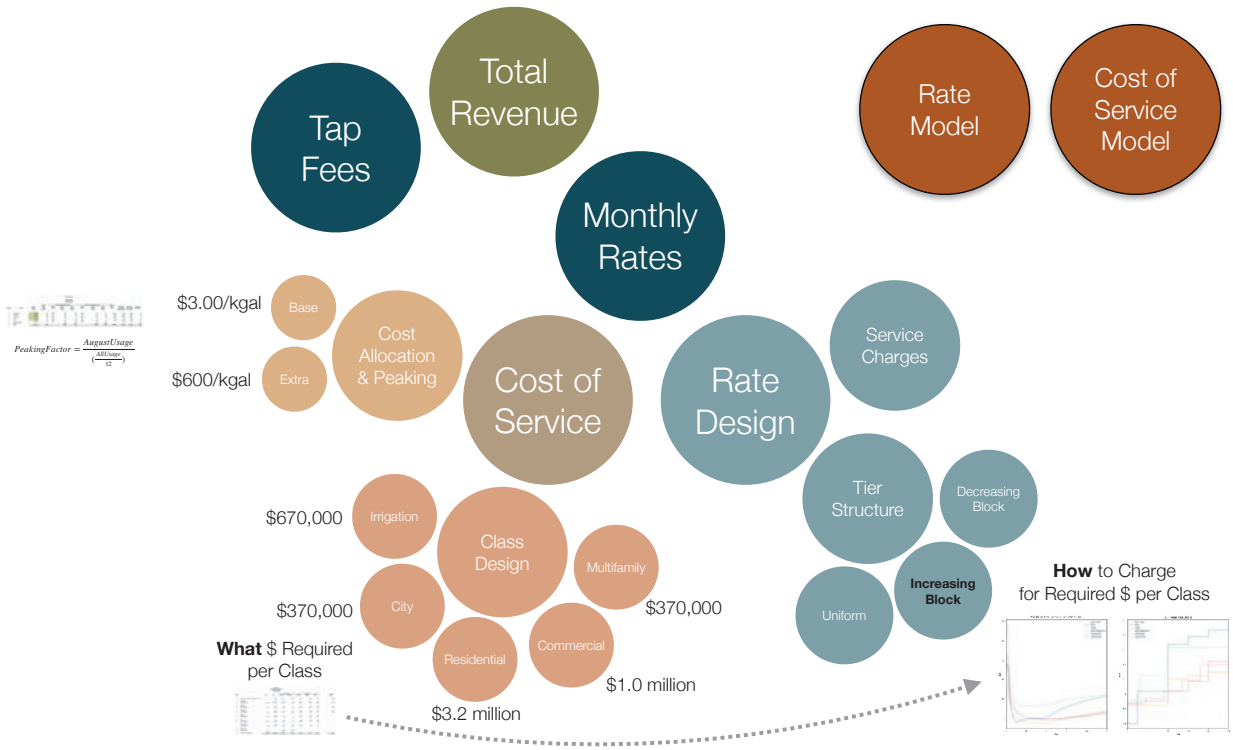
# 2013 Utility Rate Task Force Priorities

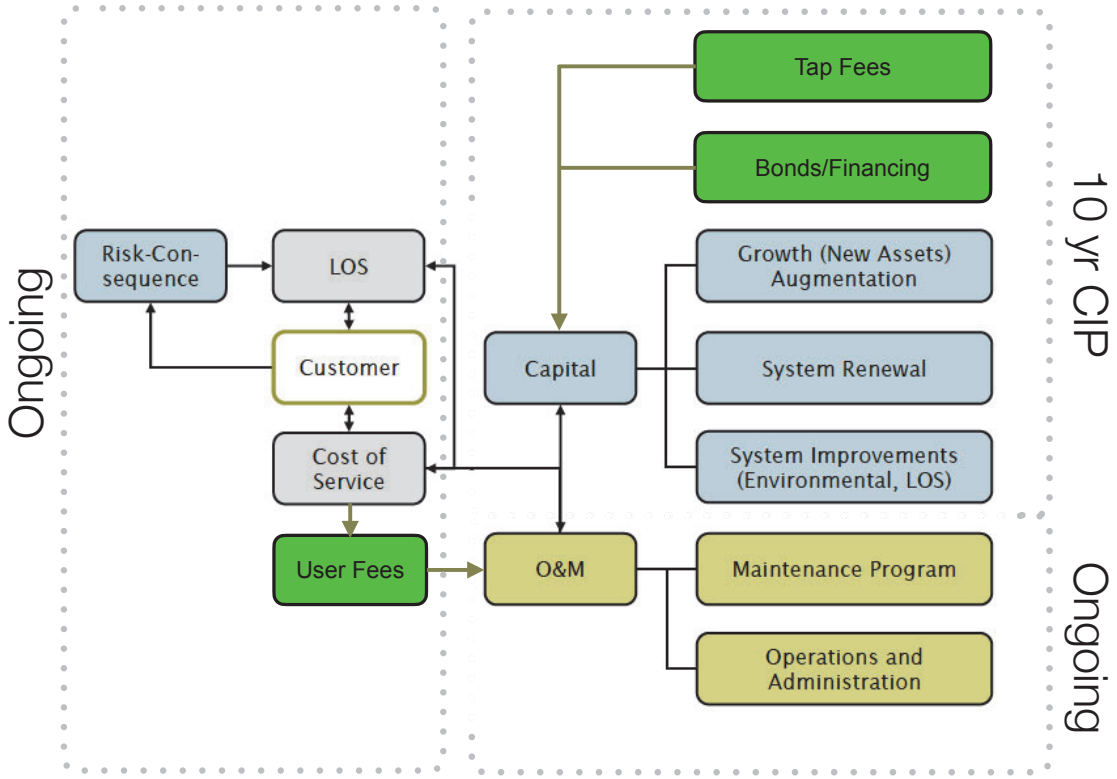
## Pricing Objective Rankings

*Louisville Rate Study Task Force*

| Pricing Objective | Total | Average | Rank |
|---|---|---|---|
| Growth pays for itself | 32 | 4.57 | 1 |
| Cost of service equity | 31 | 4.43 | 2 |
| Water conservation | 30 | 4.29 | 3 |
| Environmental enhancements | 26 | 3.71 | 4 |
| Customer acceptance | 23 | 3.29 | 5 |
| Customer impact | 21 | 3.00 | 6 |
| Fixed income / affordability | 20 | 2.86 | 7 |
| Revenue stability | 19 | 2.71 | 8 |
| Administrative ease | 18 | 2.57 | 9 |
| Peak usage reduction | 17 | 2.43 | 10 |
| Large volume customers | 12 | 1.71 | 11 |

# The Pieces of the Utility Financing Picture






# The Rate Model

Water
Sewer
Storm



## 3/4” Tap Fee
Base Fee

$14,100 **Facilities**
$39,400 **Water**

$53,500 **Total Water System Fee ***

* Provision for Developers to provide acceptable water in lieu Water Acquisition portion of fee.

# Growth Infrastructure **Facilities** Buy In $14,100

1. Raw Water Infrastructure
2. Pipes
3. Water Treatment
4. Water Storage
5. Water Pumping

Represents **Equity** via SFE's

| | | | | |
|---|---|---|---|---|
| Backbone | | | | |
| 12 | | 150,197 | $185.00 | $27,786,000 |
| 14 | | 1,830 | $189.00 | 346,000 |
| 16 | | 17,212 | $193.00 | 3,322,000 |
| 18 | | 9,114 | $197.00 | 1,795,000 |
| 24 | | 21,733 | $201.00 | 4,368,000 |
| 30 | | 935 | $206.00 | 193,000 |
| 36 | | 5,770 | $211.00 | 1,217,000 |
| | Total | 206,791 | | $39,027,000 |

| Water Treatment Plant | | | |
|---|---|---|---|
| | Max Day Capacity | Current Construction Cost per Staff | Current Cost |
| | *gallons per day* | *per gpd* | |
| Total Water Treatment Plant | 13,000,000 | $4.00 | $54,200,000 |

| Treated Water Storage | | | |
|---|---|---|---|
| | Volume | Current Construction Cost per Staff | Current Cost |
| | *gallons* | *per gallon* | |
| Total Treated Water Storage | 8,500,000 | $1.25 | $10,625,000 |

| Treated Water Pumping | | |
|---|---|---|
| | | Current Construction Cost per Staff |
| Pump Station | | $2,800,000 |
| Pump Station | | 800,000 |
| Total Treated Water Pumping | | $3,600,000 |

| Raw Water Infrastructure | |
|---|---|
| | Current Construction Cost per Staff |
| NCWCD Pipeline (Carter Lake to Broomfield) | $4,739,000 |
| NCWCD Superior Louisville Pump Station | 4,000,000 |
| Louisville NWTP & NCWCD Connecting Line | 5,900,000 |
| Eldorado Intake Buildings & Dam | 1,560,000 |
| Harper Lake Pump Station | 900,000 |
| Louisville Pipeline Interconnect | 581,000 |
| Louisville Pipeline (16-in) | 8,588,500 |
| Louisville Lateral (open ditch) | 250,000 |
| Cherry Street Pipeline | 2,393,000 |
| Louisville Reservoir | 1,450,000 |
| Harper Lake | 3,575,000 |
| Total Raw Water Infrastructure | $33,936,500 |

| Fee Calculation | | |
|---|---|---|
| Total Facilities Current Cost | $ | 141,388,500 |
| Less Principal on Outstanding Debt | $ | (5,900,000) |
| Water System Equity | $ | 135,488,500 |
| No. of Equivalents (a) | | 9,626 |
| Water SDC, per equivalent | $ | 14,076 |

(a) One equivalent represents the water service characteristics of a typical single family residential customer. One multifamily unit equals 0.8 equivalents. Nonresidential customer equivalents are based on 3/4-inch meter capacity ratios.

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**Water Utility**
**Development of Proposed Water Resource System Development Charge**

| Line No. | | | | |
|---|---|---|---|---|
| 1 | Average annual SFE usage, gallons | 117,000 | gallons | |
| 2 | Estimated water losses in City system (a) | 15% | | Includes 15% local distribution system water losses. |
| 3 | Average annual production needed to serve an SFE, gallons | 137,650 | gallons | |
| 4 | Gallons per acre-foot | 325,850 | gallons | |
| 5 | SFE per acre-foot | 2.367 | SFE | |
| 6 | Estimated C-BT current cost per acre-foot | $93,167 | per acre-foot | |
| 7 | Current C-BT cost per SFE | $39,360 | per SFE | |

| | 2020 | 2016 | 2014 |
|---|---|---|---|
| | $93,167 | $41,000 | $28,833 |
| | | 17,319.78 | |

(a) Includes 15% local distribution system water losses.

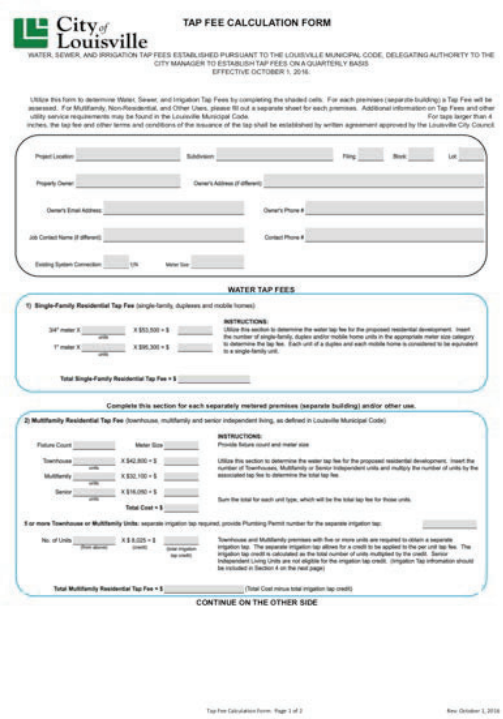
**TABLE WSDC-3**

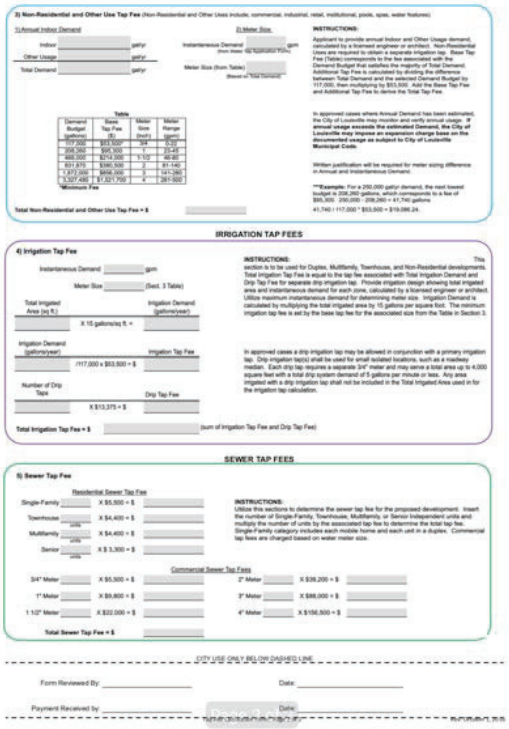
**Water Utility**
**Schedule of Water System Development Charges**

| | | Proposed SDC | | | City Demand Ratios | | | |
|---|---|---|---|---|---|---|---|---|
| Meter Size | Existing | Facilities | Water Resource | Total | Demand Amount | 3/4-inch equiv | | |
| | | | | | *gallons per year* | | | |
| 3/4 | $ 30,500 | $ 14,100 | $ 39,400 | $ 53,500 | 117,000 | 1.00 | | |
| 1 | $ 54,400 | $ 25,100 | $ 70,200 | $ 95,300 | 208,260 | 1.78 | $ 95,230 | $ 54,290 |
| 1 1/2 | $ 122,000 | $ 56,400 | $ 157,600 | $ 214,000 | 468,000 | 4.00 | $ 214,000 | $ 122,000 |
| 2 | $ 217,000 | $ 100,300 | $ 280,200 | $ 380,500 | 831,870 | 7.11 | $ 380,385 | $ 216,855 |
| 3 | $ 488,000 | $ 225,600 | $ 630,400 | $ 856,000 | 1,872,000 | 16.00 | $ 856,000 | $ 488,000 |
| 4 | $ 867,500 | $ 401,100 | $ 1,120,600 | $ 1,521,700 | 3,327,480 | 28.44 | $ 1,521,540 | $ 867,420 |

**Water Rights** Acquisition

CBT Market Rate
**Incremental Cost**




# Tap Fee Form

Categorized Fees by User
Irrigation Tap Fee
Review Annual and Instant Demands
Tap Credits on Cash Paid or Volumetric



## Categorize **$3,200,000** in Operational Costs by Function (No Capital)

| Base / MD / MH | Supply 100% / 0% / 0% | Treatment 62% / 38% / 0% | Storage 33% / 54% / 13% | Transmission 38% / 62% / 0% | Distribution Meter Equivalents | Billing # Bills | Meters Meter Equivalents |
|---|---|---|---|---|---|---|---|
| Ops Budget | $600,000 | $1,800,000 | | $300,000 | $300,000 | $100,000 | $100,000 |

## Allocate to Cost Components of Service

| Base 1.0x | Max Day 2.6x | Max Hour 3.0x | Customer Service & Billing | Distribution & Meters | Public Fire Protection (ISO Ratings) | Non Revenue Water |
|---|---|---|---|---|---|---|
| $1,400,00/yr<br>3.0 MGD<br>1.1 billion gal/yr<br>**$3.00/kgal** | $1,300,000/yr<br>3.5 MGD<br>6.5 MGD<br>**$600/kgal** | $1,300,000/yr<br>4.5 MGD<br>11 MGD<br>**$10/kgal** | $100,000/yr<br>**$1.00/Bill** | $400,000/yr<br>**$8.00/Meter** | $200,000/yr<br>**$2.00/Meter** | $175,000/yr<br>**$1.50/Meter** |
| | | | Service Charges Calculated into Readiness to Serve Charge | | Indirect Charges Calculated into Volume Charges | |

**kgal** = 1,000 gallons

**Meter** on this page means one 3/4" Meter

Volume Charges $/kgal — $3.00 per Base Kgal; $500 per Extra Demand Kgal

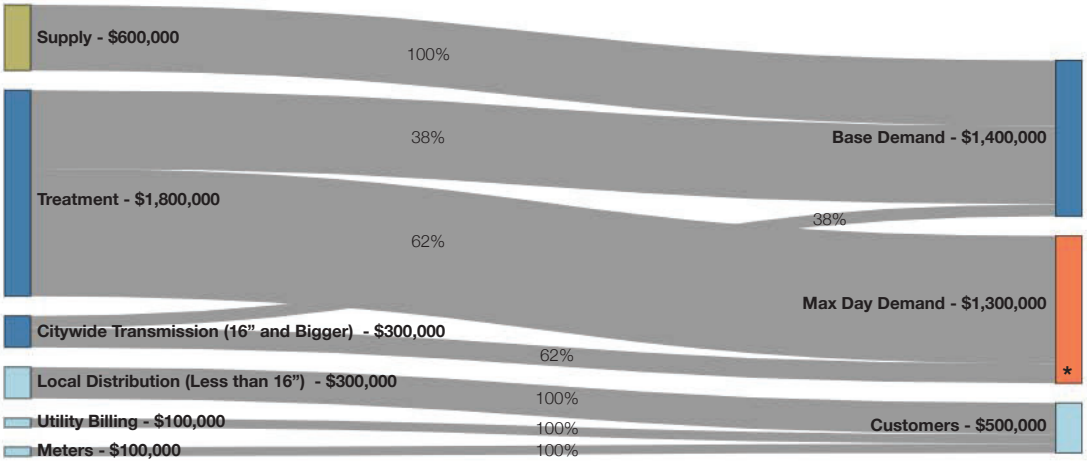
Service Charges $/Bill & Meter — $1.00 per Bill; $8.00 per 3/4" Meter

## Allocate to Customer Classes by Patterns and Peaking Factor

Current Classes

| Single Family | Muti-Family | Commercial | Irrigation | City |
|---|---|---|---|---|
| | | Commercial | | |

# How Operational Costs are Allocated



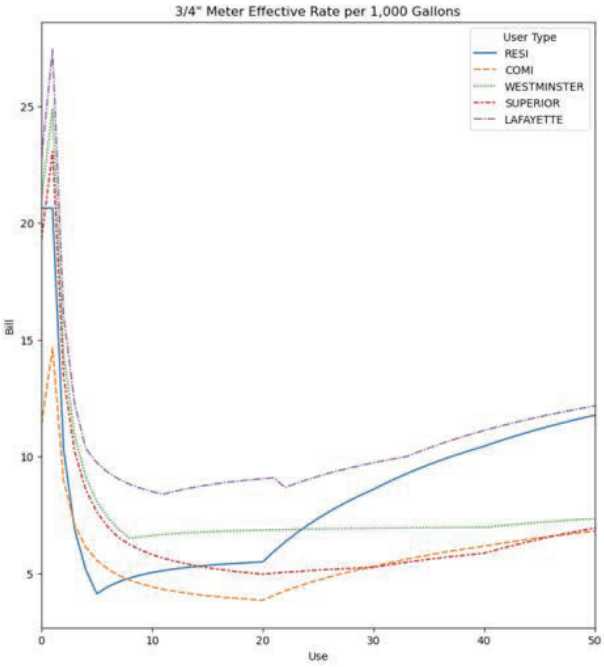

*** Max Hour Demand is served by Max Day Demand. Operationally it doesn't cost extra.**

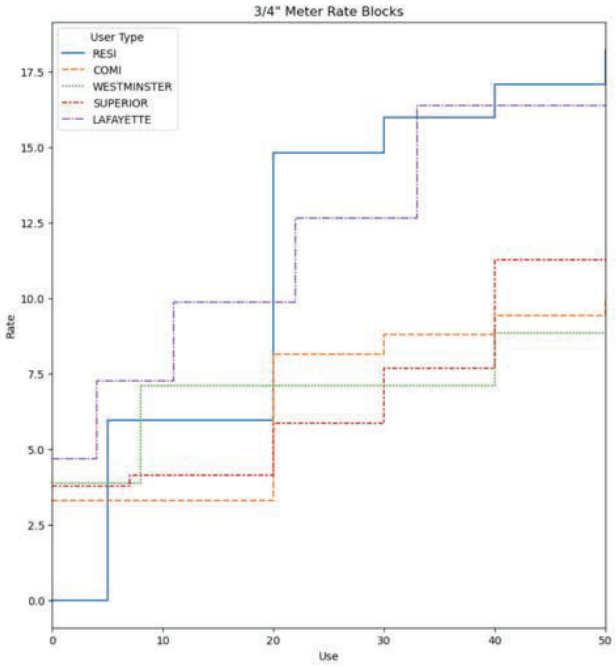
# City Capital Financing Options

- **Pay-As-You-Go** through user rates. (Monthly Bill)
- **Debt Financing** through Revenue Bonds. (Monthly Bill)
- **System Development Charges** (Tap Fees)
- **Up-Front Direct Project** Reimbursement from developers.

# 3/4” Rate Comparison

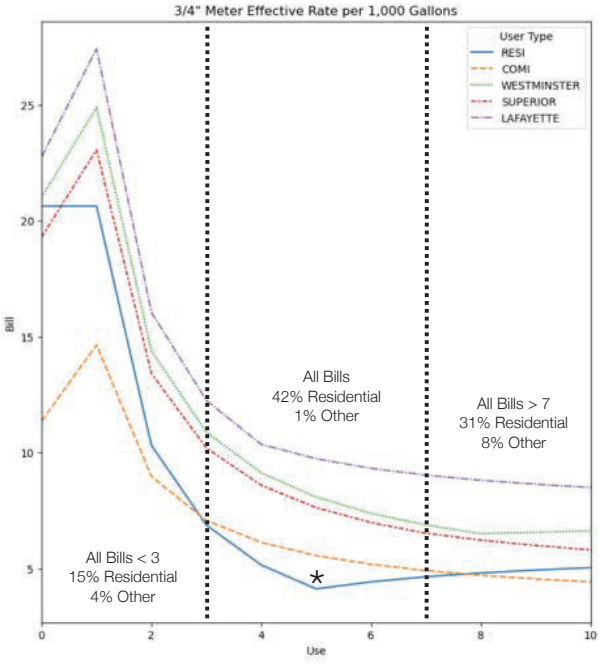
0 to 50,000 gallons

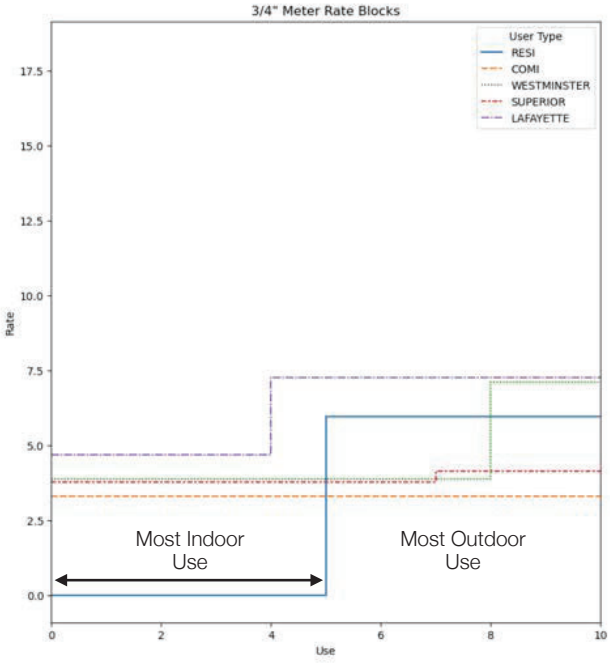



# 3/4” Rate Comparison

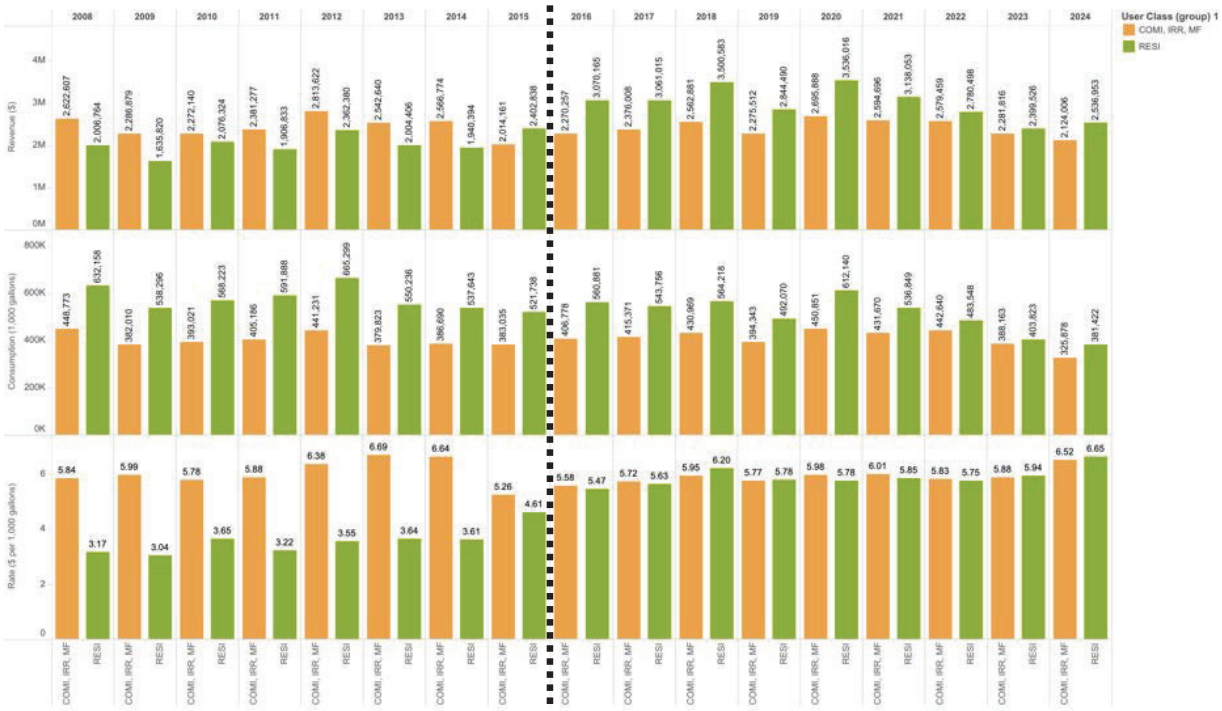
0 to 10,000 gallons



# Annual Total Revenue, Usage, $/Gallon by **Rates**

City Usage Revenue Not in Graphs (~$475,000). Add $1.00/gal to combined Commercial Rate for City Revenue.




Sum of Revenue ($), sum of Consumption (1,000 gallons) and Rate ($ per 1,000 gallons) for each User Class (group) 1 broken down by Year. Color shows details about User Class (group) 1. For pane Sum of Consumption (1,000 gallons): The marks are labeled by sum of Consumption (1,000 gallons). For pane Sum of Revenue ($): The marks are labeled by sum of Revenue ($). For pane Rate ($ per 1,000 gallons): The marks are labeled by Rate ($ per 1,000 gallons). The data is filtered on User Class and location_code. The User Class filter keeps COMI, IRR, MF and RESI. The location_code filter excludes 254062495. The view is filtered on Year, which keeps 17 of 17 members.