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Water Advisory Group

April 2, 2025 • 11 am–1 pm

Hybrid Meeting • MS Teams or Bend Utilities Department Deschutes Conference Room

Lori Faha, PE, Environmental Resources Manager

Dan Denning, Water Conservation Program Manager

Carlos Bustos, Conservation Rate Research Consultant Lead

Austin Somhegyi, PE, Stormwater Master Plan Project Manager

Trista Kobluskie, Stormwater Master Plan Consultant Lead

Aubrie Koenig, Facilitator

Purpose & Agenda

Introduce planned conservation rate research and discuss approaches and benefits of budget-based rates. Introduce feedback request on draft drainage and density policy memo.

Part I: 11am-12:30pm

1. Welcome & Introductions
2. Water Conservation Rate Research
 - o Research overview
 - o Types of budget-based rates
3. Discussion & Feedback

Part II: 12:30-1pm

1. Stormwater Master Plan
 - o Planning update
 - o Drainage and density memo
2. Summary & Closing

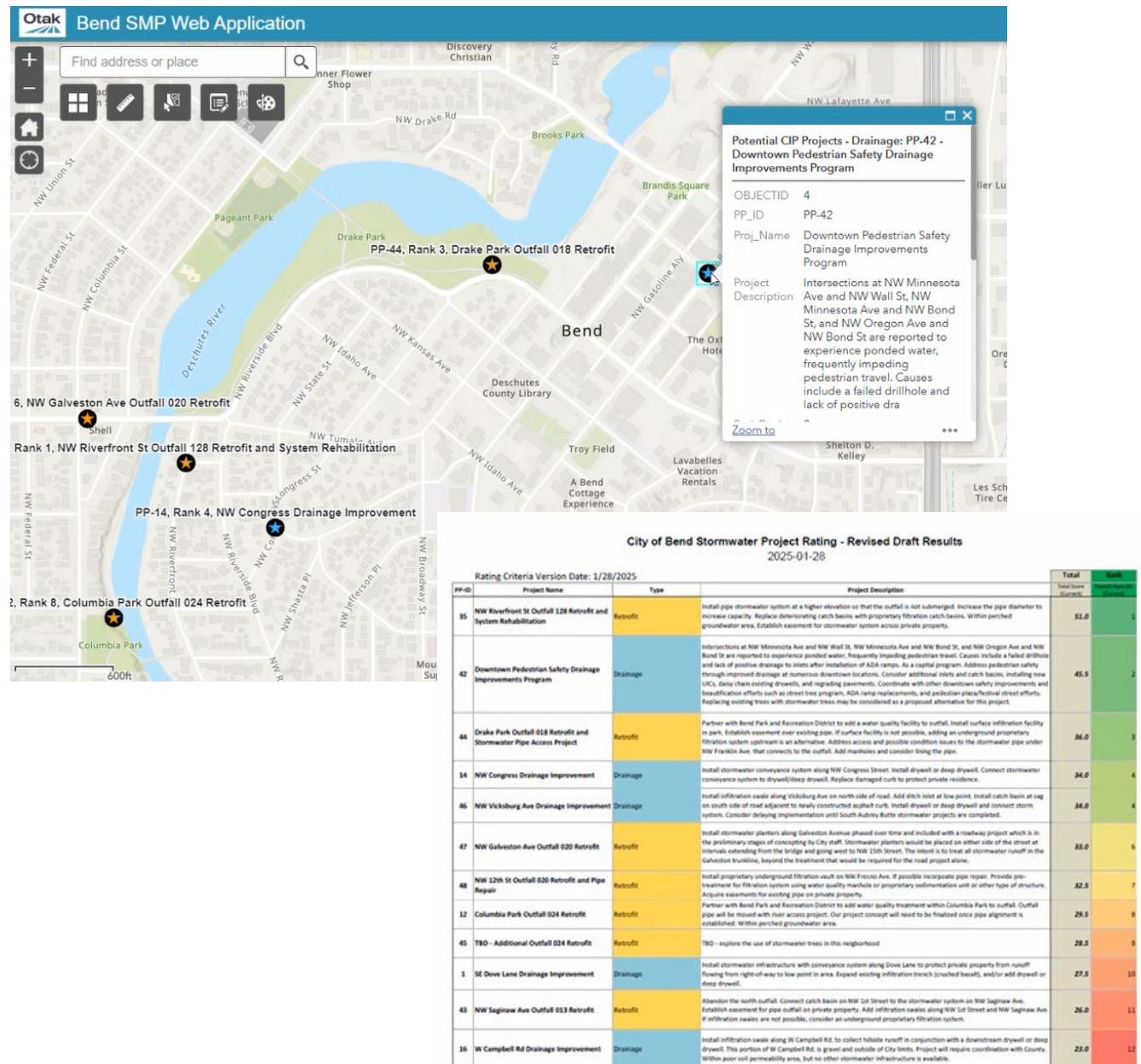


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Meeting reflections

Stormwater priorities feedback:

- Capital project list looks good
- Priorities seem well balanced (water quality and quantity, geographic distribution, range of project types)



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June tour preview

- 11 am tour start at TBD
- Walking tour of TBD
- 12:30 pm return to TBD for lunch

Look for more RSVP info soon!



2024 Newport walking tour with WAG



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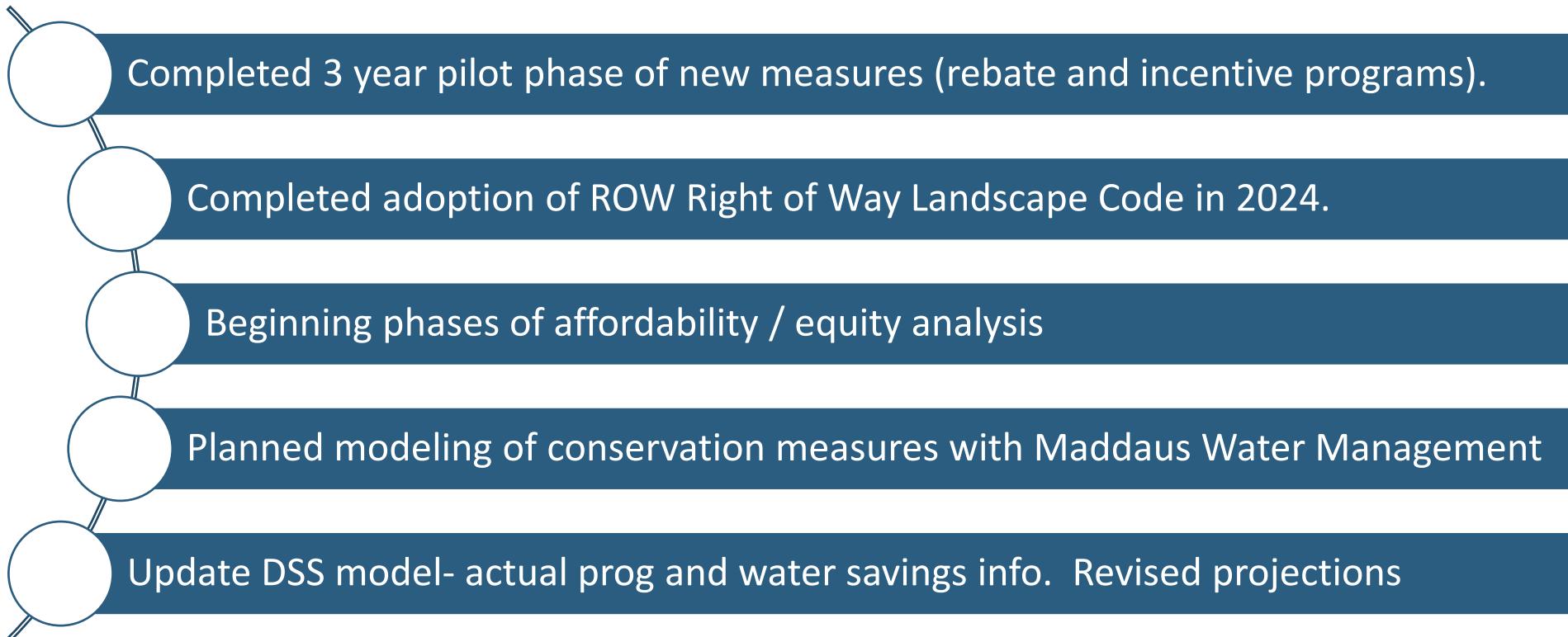
Water Conservation Program Update



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Water Conservation 2024 overview

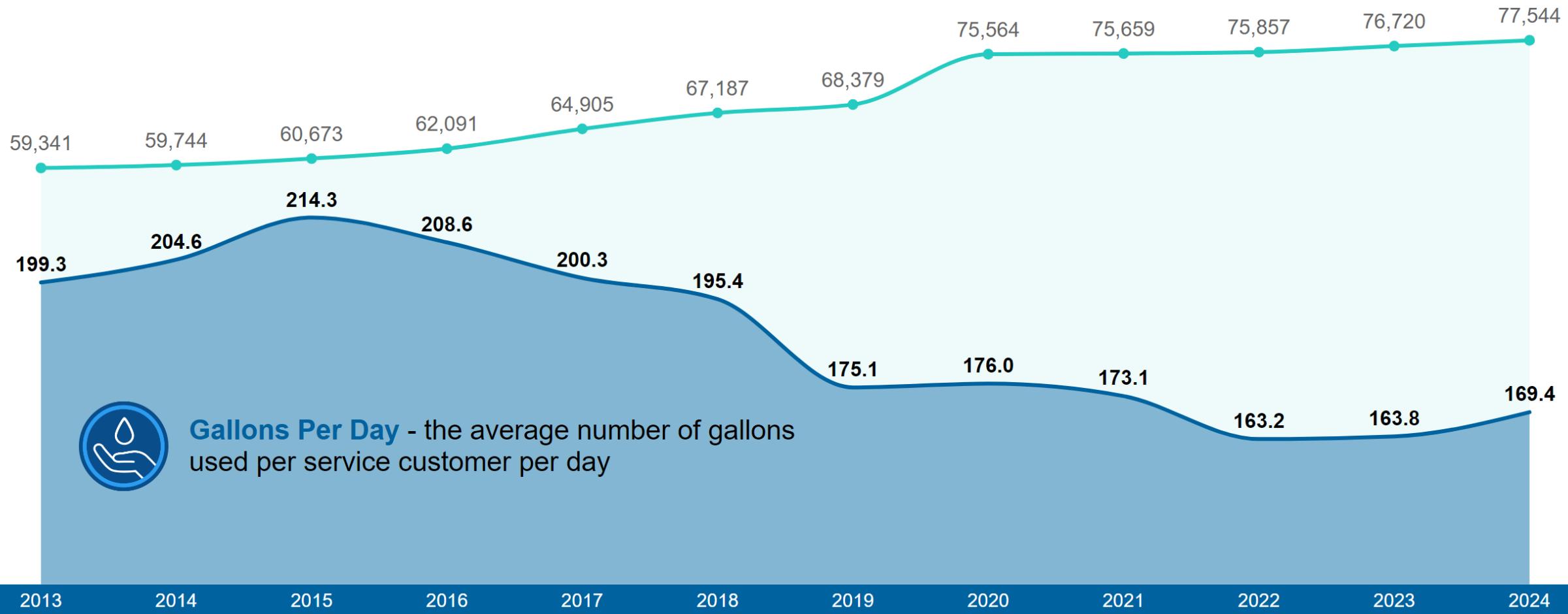
Since adoption of 2021 WMCP and phased roll out starting 2022



City of Bend Water: Gallons Per Capita Per Day (GPCD)

Gallons Per Day
 City of Bend Water Service Area Population

Service Area Population - change in number of people served by City of Bend Water over time

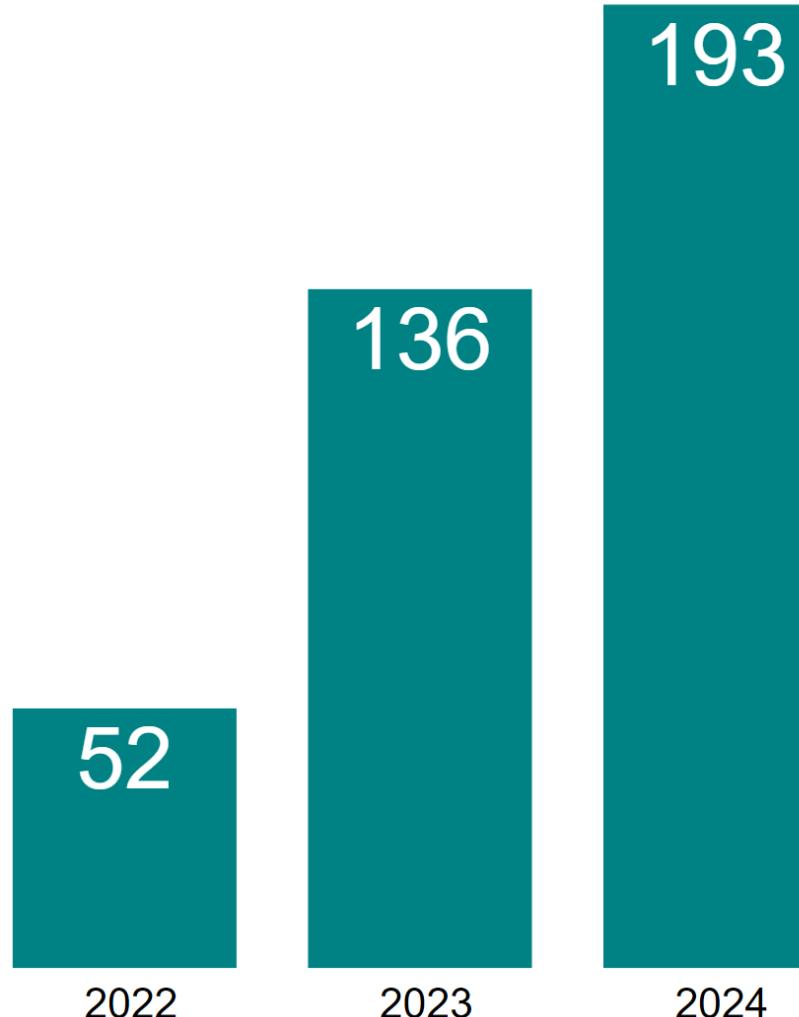


Gallons Per Day - the average number of gallons used per service customer per day

Rebate Incentives

1.23
Million Gallons
Saved

Approved Rebate Applications



Rebate Year

Select all

2022

2023

2024



Indoor Products Installed Since 2022

	Multi-Family Residential	Single Family Residential	Total
High Efficiency Toilet	134	124	258
High Efficiency Washing Machine	0	116	116
Hot Water Recirculator	0	10	10
Total	134	250	384



Outdoor Products Installed Since 2022

	Multi-Family Residential	Single Family Residential	Total
Drip Conversion Kit	0	14	14
High Efficiency Nozzles	91	444	535
Irrigation Submeter	0		0
Pressure Regulating Spray Sprinkler	91	201	292
Weather Based Irrigation Controller	1	154	155
Total	183	813	996

Sprinkler Inspection Program



Total Water Saved

*Since 2018**

3,949,460,884

Gallons Saved



Total Inspections

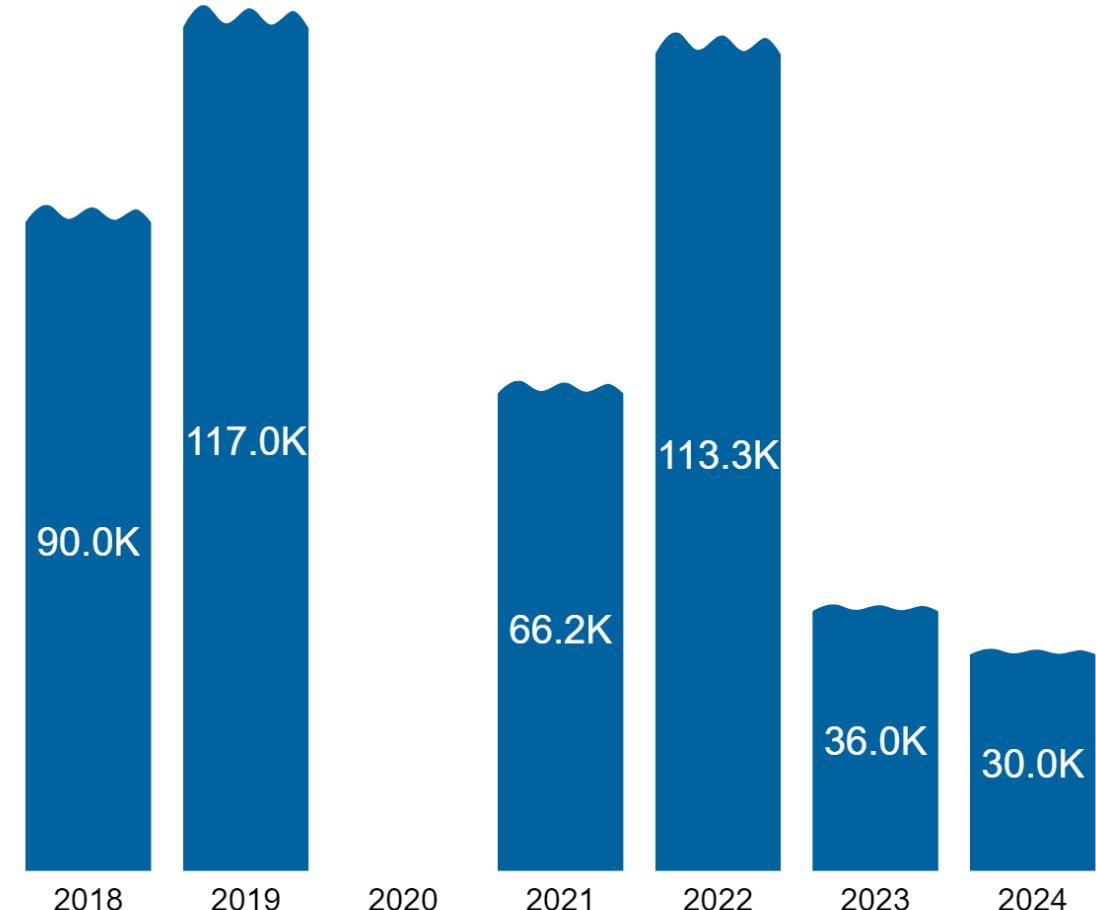
*Since 2018**

987

Customer
Inspections

Average Water Savings Per Customer

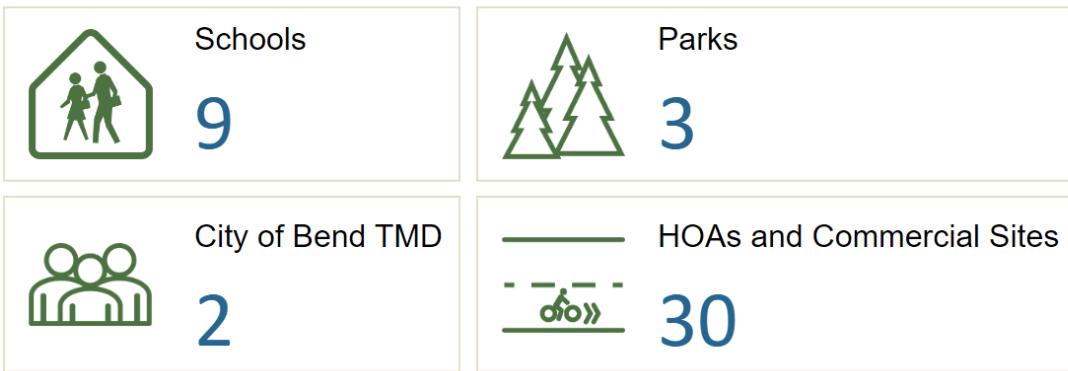
In Gallons



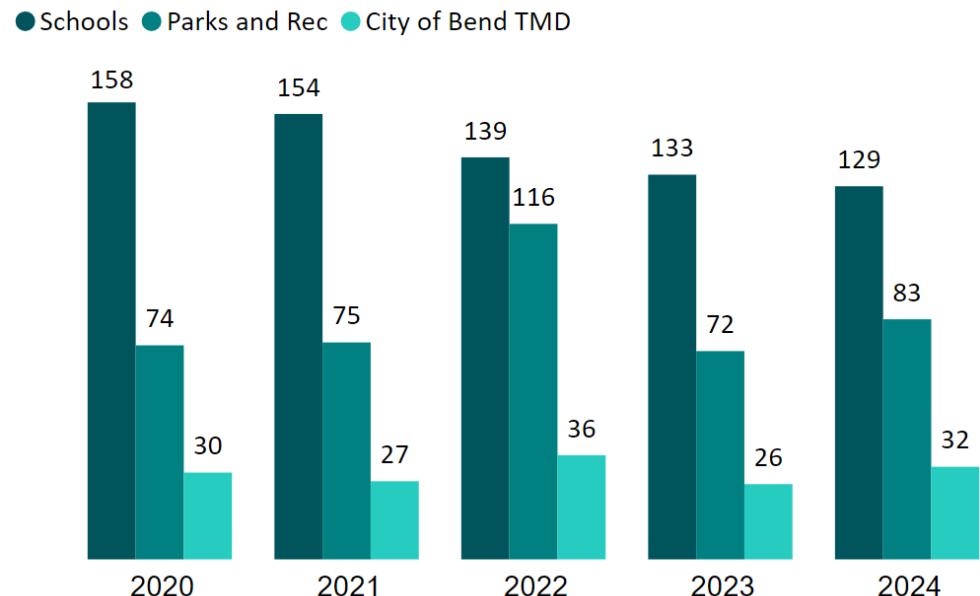
*Data Through 2024

Large Landscapes

Participants by Type

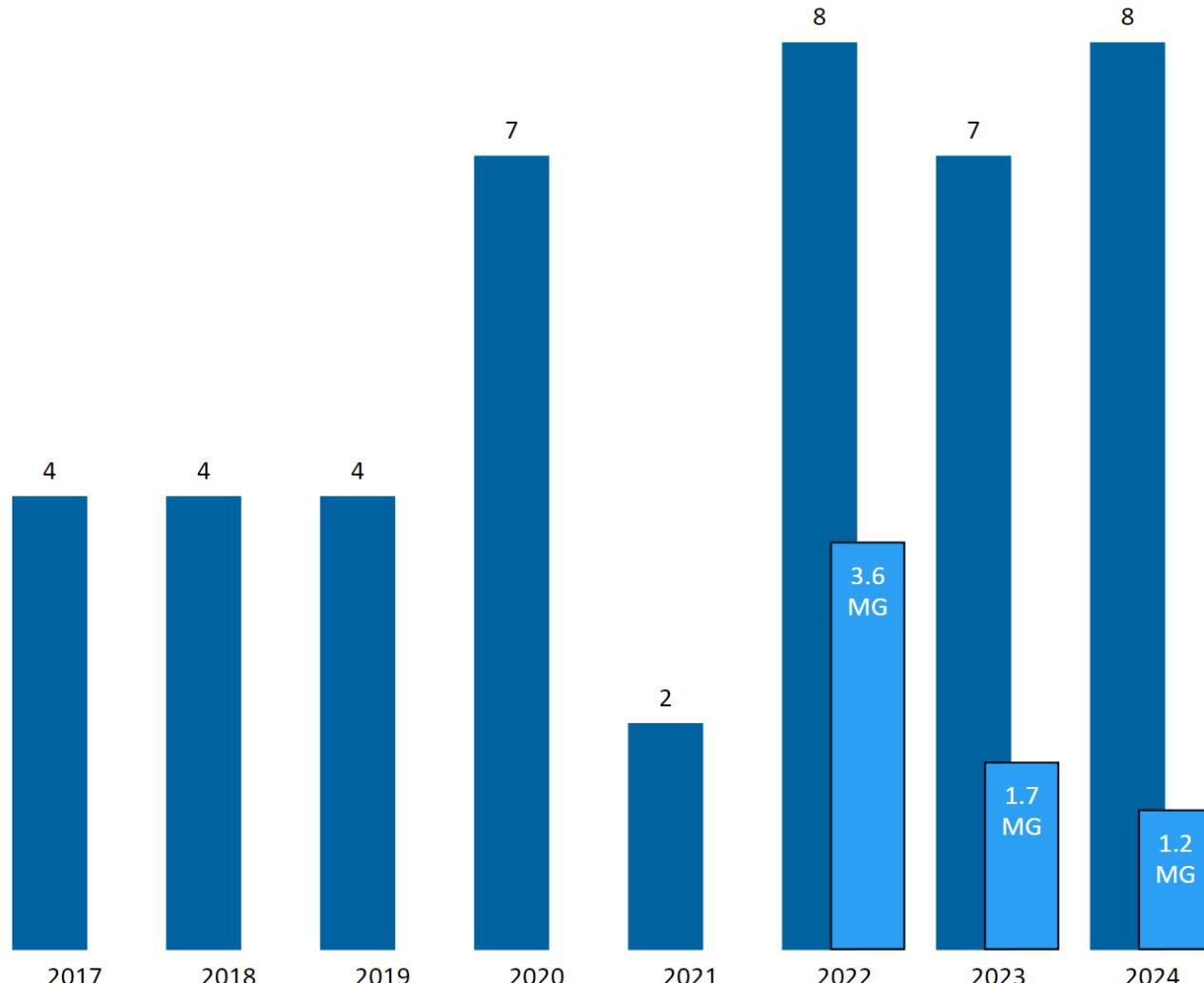


Annual Water Use for Top Three Water Customers (Million Gallons)



Large Landscape Participants and Water Savings

● # of Participating Sites ● Annual aggregate water savings (Million Gallons)



Water Waste

Year

Select all

2021

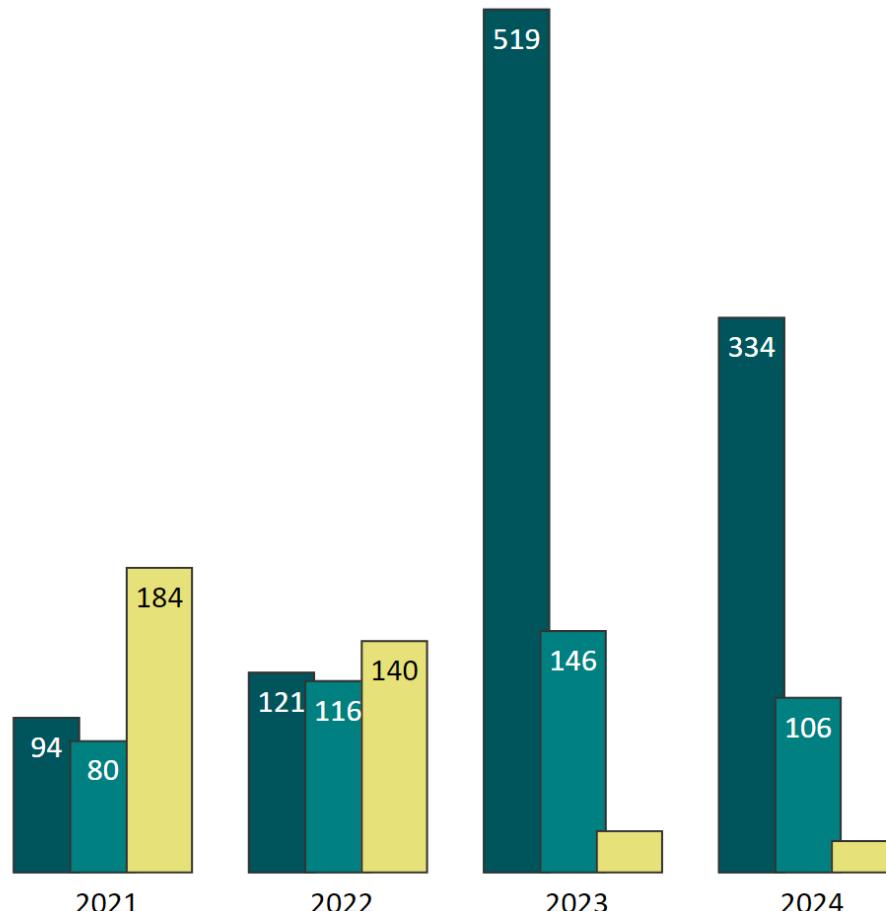
2022

2023

2024

Enforcement Cases Summary

● Inspections ● Resolved Cases ● Average Days to Resolve



Engagement Efforts

Since 2021

2,296 Total Activities



Activities include verification, notification, inspection, re-inspection, and sending educational letters and Notices of Violation

5,832

Educational Letters
Sent

259

Notice Of Violation
Letters Sent

0

Fines Levied



Contacts reflect the total number of people engaged through all enforcement case efforts

1,080 Contacts

Water Conservation Rate Research

Carlos Bustos
Senior Water Resources Project Manager

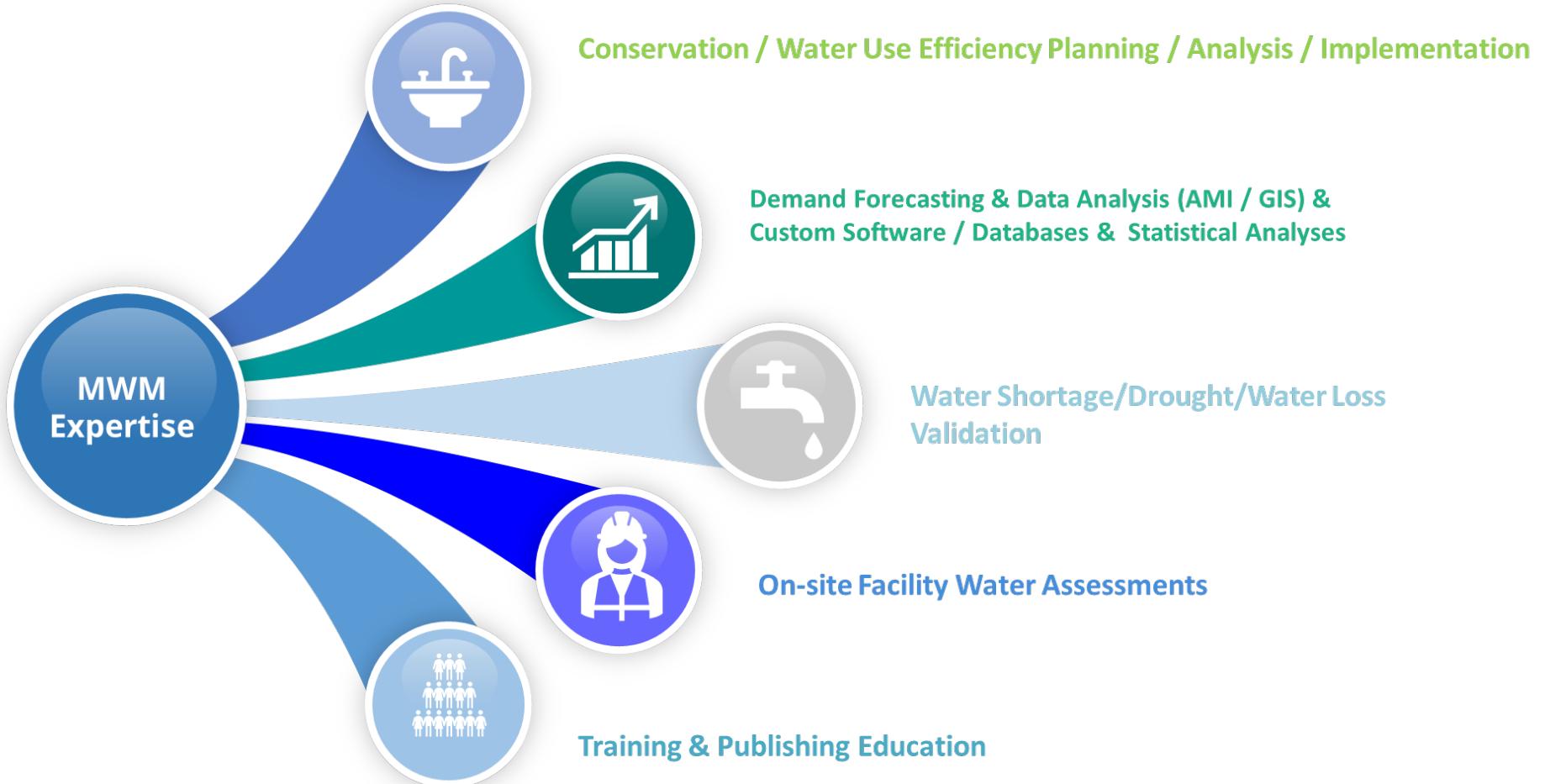


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MADDAUS WATER MANAGEMENT

Making a Difference in the World of Water™



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Agenda

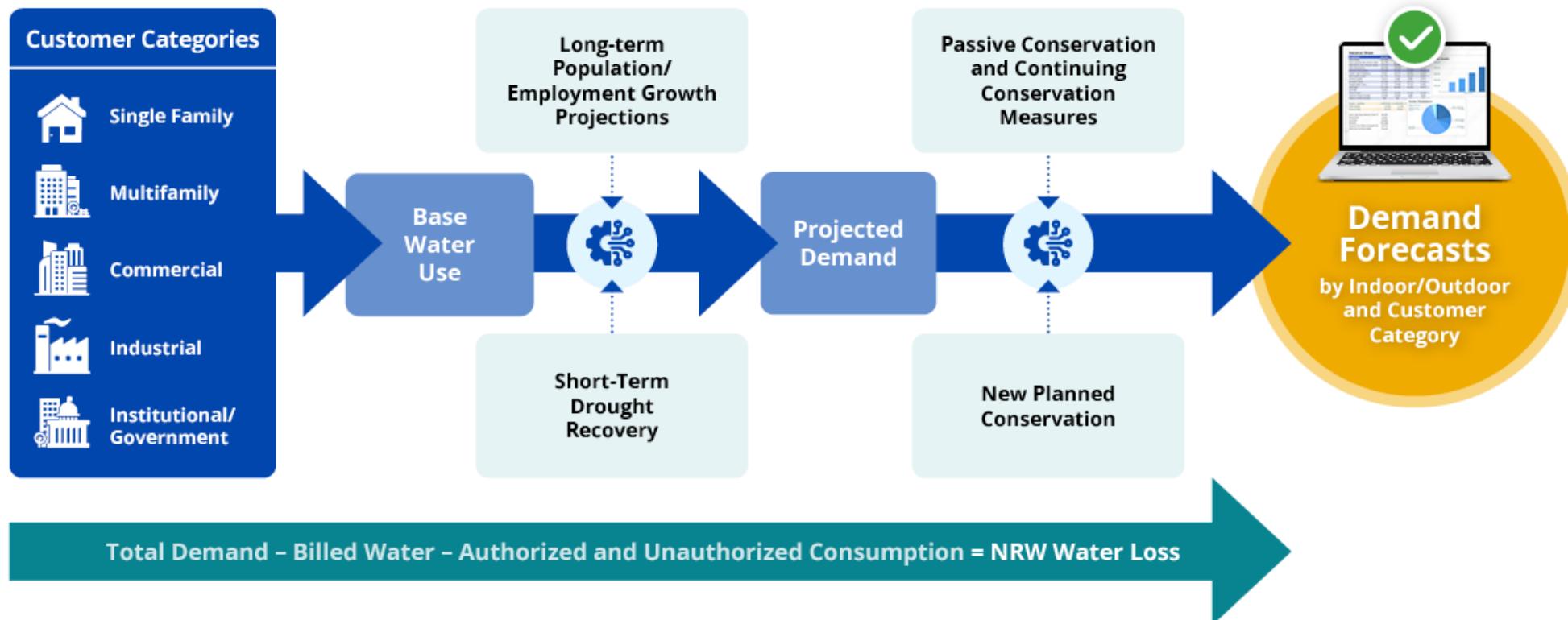
- ◊ Review project scope
- ◊ Related work (scope 2)
- ◊ Purpose of rates
- ◊ Elements of rates
- ◊ Review current rate structure
- ◊ Comparison of common rate types
- ◊ Understanding budget-based rate types
- ◊ Feedback Q&A



Conservation Project Scope of Work

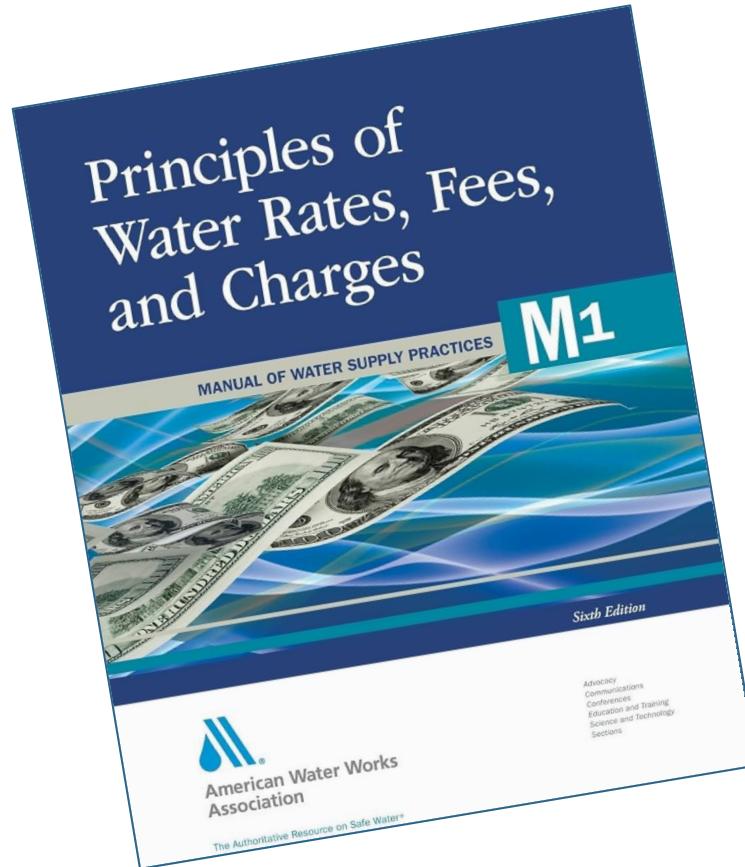
MADDAUS WATER MANAGEMENT

DSS Model Forecast 2025-2050



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Budget-Based Rate Research Overview



Review best practices for conservation-oriented budget rate design



Collect feedback for the research



Collect and analyze rate structures from 10 utilities



Collaborate to pick 3-5 utilities for a deeper dive



Produce final report



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Budget-Based Rates Past Research: MWM Experience

BOZEMAN^{MT}



metrovancouver



Conducted a survey of 18 water utilities to learn more about the process and formulation of current CII rate structures for:

- **Jordan Valley Water Conservancy District, Utah**

Using the Demand Model reviewed rate studies and tiered rate structures for:

- **City of Bozeman**, 2023 Water Customer Survey and Conservation Plan
- **City of Spokane**, 2022 Water Conservation Plan and DSS Model Software
- **Dallas Water Utilities**, 2024 Long Range Water Supply Update
- **Portland Water Bureau**, 2024 Water Conservation Planning Study
- **MetroVancouver**, 2024 Assessment of Water Conservation Potential



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Purpose of Rates

Water utility rates are more than just a bill—
they're a strategic tool to:

- Recover costs
- Promote fairness and affordability
- Encourage conservation
- Fund capital improvements
- Ensure system resiliency
- Communicate the value of water



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Elements of Effective Rates (Things to Consider)

When establishing water rates, utilities must consider:

- ◊ Financial sufficiency
- ◊ Equity and fairness
- ◊ Conservation goals
- ◊ Affordability
- ◊ Regulatory compliance
- ◊ Customer understanding
- ◊ Long-term sustainability



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The City of Bend Water Rate Structure



- One structure applied to all customers
- Monthly charge applied to meter size
- Water use billed volumetrically per 100 cubic feet (HCF) Hundred Cubic Feet = 748 gallons

Customer Type	Meter Charge	Volumetric Rate	Outside City Limits	Base Rate
(SFR-Single Family Residential)	"See base rate"	\$2.25 HCF	\$3.37 CCF	$\frac{3}{4}$ "-\$27.07 1"- \$31.14
(MFR -Multi Family Residential)	" "	\$2.25 HCF	\$3.37 CCF	1.5"- \$61.81 2"- \$80.00 3"- \$128.59
(Comm- Commercial)	" "	\$2.25 HCF	\$3.37 CCF	4"- \$183.18
Bulk (Hydrant)	Set up -\$180 Monthly- \$53.33	\$2.25 HCF		6"- \$334.73 8"- \$516.67 10"- \$729.02 12" \$977.64



Comparison of Rate Types

The “AWWA Manual M1, Principles of Water Rates, Fees, and Charges” outlines several types of rate structures, each designed to balance financial stability, equity, conservation incentives, and customer affordability.

1. Uniform Rate

How it works: A constant price per unit of water (e.g., per 1,000 gallons or cubic feet), no matter how much water a customer uses.

Pros: Simple to understand and administer; predictable revenue.

Cons: Doesn't encourage conservation as strongly as tiered rates.

2. Inclining Block (Tiered) Rate

How it works: The price per unit of water increases as usage increases, typically in "blocks" or tiers.

Pros: Encourages conservation by charging higher rates for higher usage; promotes equity.

Cons: More complex to administer; revenue can fluctuate if usage patterns change significantly.



Comparison of Rate Types

The AWWA Manual M1, Principles of Water Rates, Fees, and Charges, outlines several types of rate structures, each designed to balance financial stability, equity, conservation incentives, and customer affordability.

3. Declining Block Rate

How it works: The price per unit of water decreases as usage increases.

Pros: Encourages large-scale users (like industries or agriculture) to use more water, potentially boosting revenue.

Cons: Discourages conservation; may be viewed as inequitable for smaller users.

4. Seasonal Rate

How it works: Rates change depending on the time of year, typically higher during peak-demand seasons (like summer).

Pros: Encourages conservation during peak periods; aligns pricing with higher supply costs in peak seasons.

Cons: Can be harder for customers to predict bills; requires good communication.



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Comparison of Rate Types

The AWWA Manual M1, Principles of Water Rates, Fees, and Charges, outlines several types of rate structures, each designed to balance financial stability, equity, conservation incentives, and customer affordability.

5. Drought/Shortage Rates

How it works: Temporary rate structures implemented during water shortages or droughts.

Pros: Provides strong price signals to reduce demand during critical times; helps recover costs related to drought management. [Use and Effectiveness of Municipal Irrigation Restrictions During Drought - Alliance for Water Efficiency](#)

Cons: Short-term; may face public resistance if not well explained.

6. Conservation-Oriented Rates

How it works: Provides a basic quantity of water at a low rate, with higher rates applied to additional usage.

Pros: Protects affordability for essential water use; encourages conservation for non-essential use.

Cons: Revenue generation may be a challenge; requires careful balance to maintain financial sustainability.



Comparison of Rate Types

The AWWA Manual M1, Principles of Water Rates, Fees, and Charges, outlines several types of rate structures, each designed to balance financial stability, equity, conservation incentives, and customer affordability.

7. Flat Rate

How it works: Customers are charged a fixed amount regardless of how much water they use.

Pros: Very simple; predictable revenue.

Cons: No incentive for conservation; inequitable because it doesn't reflect actual usage.

8. Minimum Charge or Base Charge

How it works: A fixed charge that typically covers the fixed costs of service, applied in addition to usage rates.

Pros: Helps recover fixed costs reliably; stabilizes revenue.

Cons: Can be viewed as unfair by low-usage customers; doesn't encourage conservation on its own.

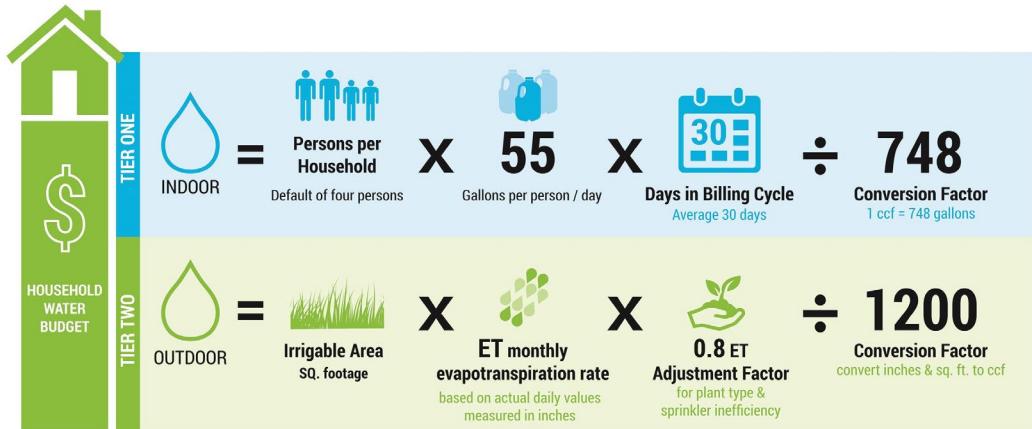


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Understanding Budget-Based Rate Types

What Are Budget-Based Rates?

Also called Water Budget Rates, are a type of **customized rate structure** where a customer is allocated a specific amount of water (their "budget") based on their reasonable water needs.



Budgets are typically tailored to factors like:

- Household size
- Irrigable landscape area
- Evapotranspiration rates
- Seasonal Weather Conditions
- Specific customer types



Understanding Budget-Based Rate Types

Feature	Indoor/Outdoor Accounts	Irrigation-Only Accounts
Use Type	Mixed use (indoor + outdoor)	Outdoor irrigation only
Indoor Allocation	Yes, based on population and GPCD	None
Outdoor Allocation	Yes, based on irrigated area and climate factors	Yes, often larger areas, same principles
Meter Type	Typically one meter for all water use	Dedicated landscape irrigation meter
Purpose of Budgeting	Promote efficient water use indoors and outdoors	Encourage efficient landscape irrigation only



Understanding Budget-Based Rate Types

How do they work?

1. Establish the Budget

- Indoor budget: Based on the **number of people** in a household
- Outdoor budget: Based on the **square footage** of irrigable landscape and **local climate data (ET)**.

2. Rate Tiers Applied to Usage

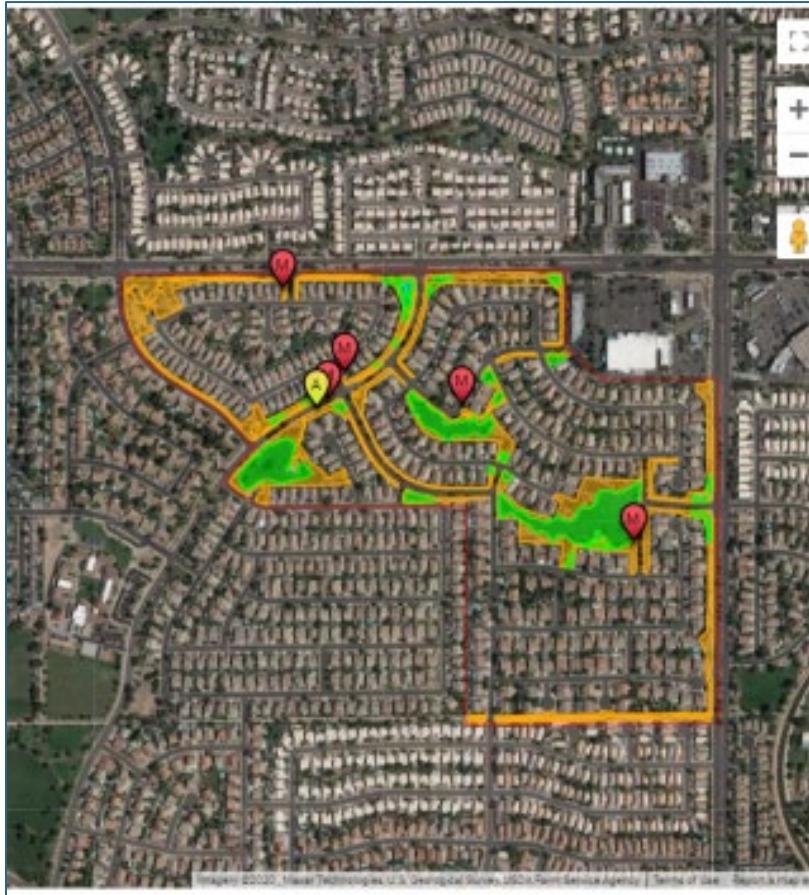
- **Tier 1 (Basic Needs):** Use within the budget is charged the **lowest rate**.
- **Tier 2 (Inefficient Use):** Slightly higher rates for use above the budget.
- **Tier 3 (Excessive Use):** Highest rates for excessive or wasteful use.

3. Customer-Specific Allocations

- Customers can **request adjustments** to their budget (e.g., more people living at home, medical needs, changes in landscaping).



Understanding Budget-Rate Types



Advantages (Pros)

- Promotes Water Use Efficiency
- Equity and Fairness
- Affordability Protection
- Supports Peak Demand Management
- Encourages Sustainable Landscaping

Challenges (Cons)

- Could be Costly and Complex to Implement
- Requires Customer Education
- Appeals and Adjustments
- Costs to Maintain



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Understanding Budget-Rate Types

Effective Implementation

Require	Require agency flexibility
Promote	Promote variances
Leverage	Leverage technology
Base	Base allocations on existing efficiency standards
Consider	Consider timing carefully
Provide	Provide sufficient time for customers to adjust
Implement	Implement a strong education and marketing campaign



Understanding Budget-Rate Types

Impact on Affordability, Capital Improvements, and Peak Demand

Affordability

- 💧 Supports affordability by ensuring basic needs are met at low rates.
- 💧 Helps low-income households if their usage stays within budget.

Capital Improvement Planning

- 💧 Provides demand forecasting data based on how customers use water, helping with long-term capital planning.

Peak Demand Management

- 💧 Effectively reduces peak demand, especially outdoor irrigation during hot seasons.
- 💧 Reduces strain on the system during high-demand periods.



Next Step: Collect and analyze rate structures from 10 utilities

Currently evaluating the following agencies as options to further analyze

- 1. Irvine Ranch Water District
- 2. Rancho Santa Margarita Water District
- 3. Capistrano Valley Water District
- 4. East Bay Municipal Utility District
- 5. City of Santa Barbara
- 6. Fort Collins
- 7. Albuquerque Water System
- 8. Elsinore Valley Municipal Water District
- 9. City of Aurora
- 10. Otay Water District
- 11. San Antonio Water System
- 12. Moulton Niguel Water District
- 13. Centennial Water and Sanitation District
- 14. City of Boulder
- 15. Rancho California Water District
- 16. City of Redmond
- 17. City of Corvallis
- 18. City of Gresham
- 19. Tualatin Valley Water District



Discussion & Feedback



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WAG discussion questions



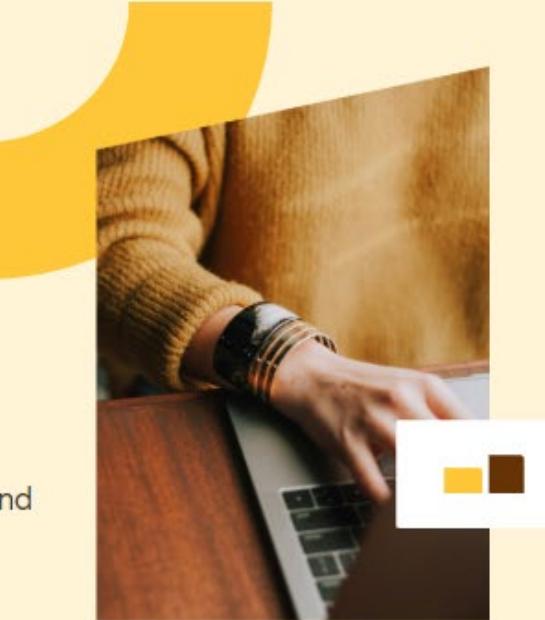
- What challenges and benefits do you see with the various budget-based rate types?
- What objectives do you feel are most important when evaluating budget-based rate options? (e.g., managing peak demand, maintaining affordability, etc.).
- What questions do you feel are important to ask of other utilities using these structures?

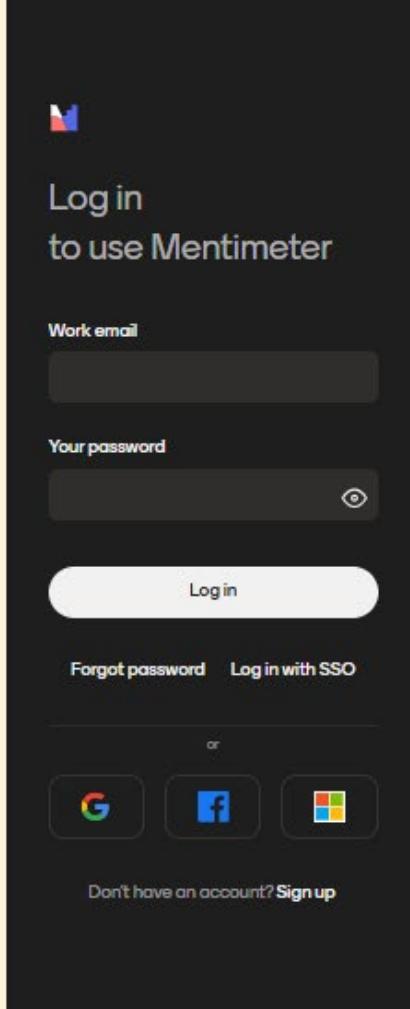


Poll

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The image shows the login screen for the Mentimeter website. It features a dark background with a white 'M' logo at the top. Below it, the text 'Log in to use Mentimeter' is displayed. There are fields for 'Work email' and 'Your password', both with red placeholder text. A 'Log in' button is at the bottom, with 'Forgot password' and 'Log in with SSO' links nearby. Social media login options for Google, Facebook, and Microsoft are shown at the bottom, along with a 'Don't have an account? Sign up' link.



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Stormwater Master Plan Drainage and Density Follow-up Discussion

Draft Findings
Next Steps



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WAG discussion questions



- Do you support eliminating barriers to managing stormwater in a more centralized fashion within subdivisions, rather than on each lot?
- Would the Bend community support allowance for some private runoff to be managed in public streets in facilities owned and operated by the City, especially residential runoff?
- In your experience outside of Bend, are you aware of a regional stormwater facility constructed by a City that is used to meet stormwater requirements for redevelopment projects?



Drainage and Density

Stormwater Management Options for Increasingly Dense Development



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Context

- Rapid growth
- Need for diversity of housing options
- Increasing density of development overall
- Economic development



Bend Stormwater Master Plan

Drainage and Density: Stormwater Management Options for Increasingly Dense Development

Draft – March 2025



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Lot-Scale Stormwater Management (SWM) - Default

Development Type	Location of Stormwater Facility	Who is Draining	Facility Owner
Residential Subdivision	Lot / Homesite	Private	Individual Property Owner
Non-Residential Site Development*	Lot / Parking or Landscaping	Private	Commercial Property Owner
Infill	Lot / Homesite or Commercial	Private	Individual Property Owner or Commercial Property Owner or HOA
Public Projects	ROW	Public	City

*Includes multi-family for purposes of this topic



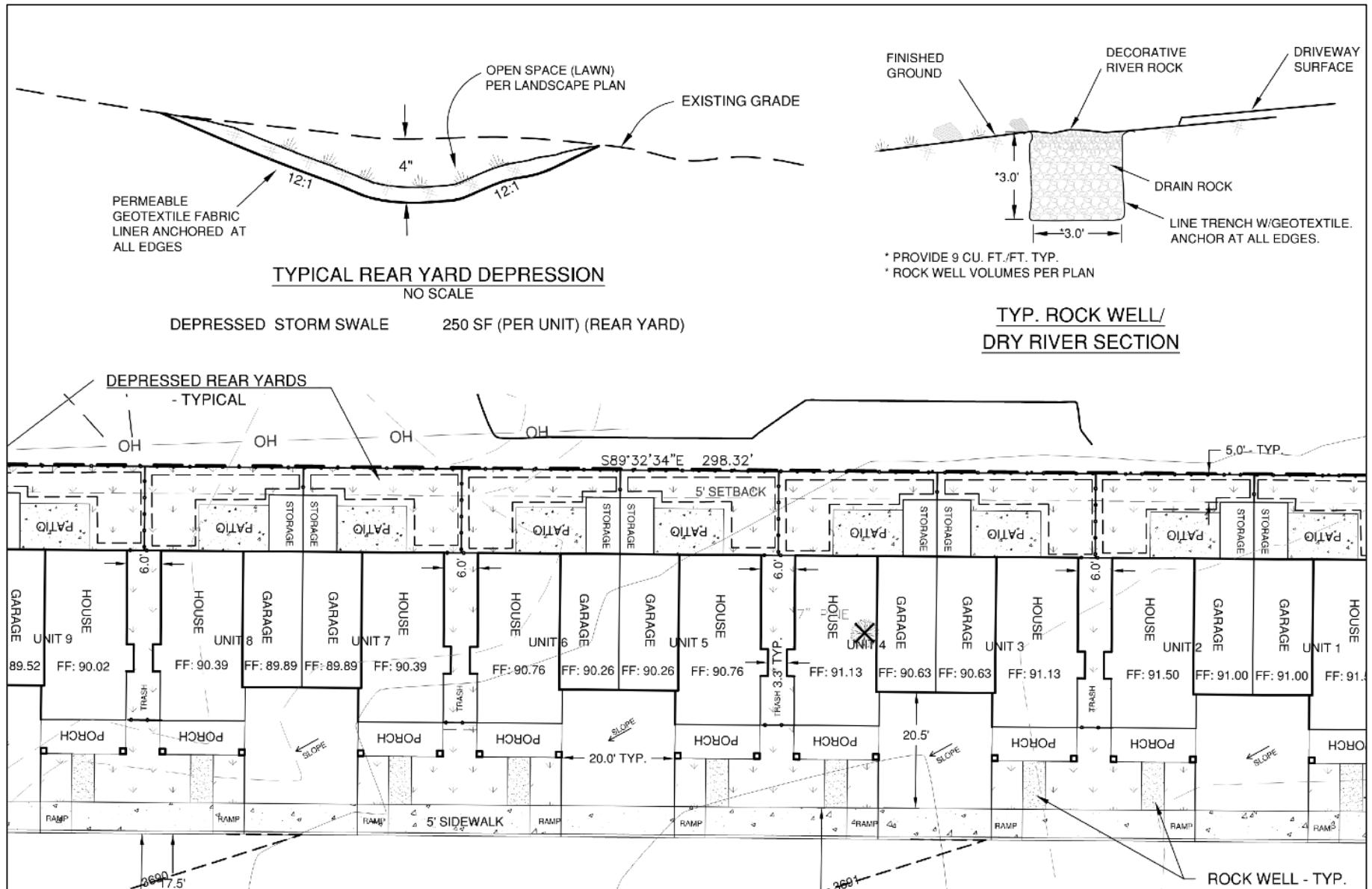
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Limitations of Lot-Scale SWM

- Siting
 - Small residential lots have little room for lot-by-lot stormwater facilities
 - Small residential lots end up with stormwater facilities but no yard
 - Central Core zero lot line development and some infill not compatible
- Permitting
 - Simplified calculations and assumptions used for numerous small facilities
 - Cost of lot-by-lot field tests and inspections could be prohibitive
 - Lot SWM facilities constructed by builders
- Operation
 - Individual homeowners are left in charge of underground stormwater facilities such as drywells and infiltration trenches that are not easy to see, inspect, or clean
 - Individual landowners are left in charge of small surface stormwater facilities that are easily mistaken for landscaping that can be changed or filled in



Example - Woodhaven



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Centralized On-site SWM Options

Development Type	Location of Stormwater Facility	Who is Draining	Facility Owner	Proposed Approval Process
Residential Subdivision	Tract, or individual lot, or combination	Private and Street	HOA	Typically Type II
Non-Residential Site Development	Lot	Lot	Commercial property owner	Typically Type II
Infill	TBD	TBD	TBD	TBD
Public Projects	Negotiated	City and other agency	Negotiated	Negotiated



Examples



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Barriers to Centralized On-site SWM

- Procedures
 - BMC 16.15.040.A.4, 6, and 8 allow stormwater runoff to leave the lot of origin and be managed elsewhere, especially in residential subdivisions, under certain circumstances (BMC 16.15.040.A.4, 6, and 8).
 - We are still studying why these provisions are not used often; there may be procedural barriers.
 - Pre-Application forms do not include mention of stormwater
 - Are WAG members aware of other procedural barriers?
- Funding
 - When the developer sells the lots to builders, there is a financial disincentive to centralize SWM
 - When the developer also builds all the houses, there is no funding barrier



Barriers to Centralized On-site SWM

- Current Code and Standards
 - Title 16 emphasizes that runoff must remain on the lot of origin. It offers other options when circumstances do not allow runoff to remain on lot of origin.
 - Master plans seem to limit comingling of private with public runoff to residential roof runoff, omitting driveways, etc.
 - Possible longer review times for master planned developments than typical residential subdivision
 - When the developer sells the lots to builders, the City may lack code provisions to adequately ensure centralized SWM facilities are protected from sedimentation during construction. We are still studying this.



Public Street Rights-of-Way (ROW) SWM Options

Development Type	Location of Stormwater Facility	Who is Draining	Facility Owner	Approval Process
Infill	Public Street ROW	Lots	City	TBD; not currently approvable
Public Facilities	Public Street ROW	City and other agency	Negotiated	Intergovernmental Agreement



Barriers to ROW SWM

- Current Code and Standards
 - Title 16 emphasizes that runoff must remain on the lot of origin. It offers other options when circumstances do not allow runoff to remain on lot of origin.
 - BMC 16.15.040.A.4 allows drainage from private property to enter the ROW when the City is compensated for constructing and operating SWM facility, BUT City has no mechanism for calculating or collecting such a fee.
- Procedures
 - Pre-Application forms do not include mention of stormwater
- Funding
 - Stormwater fee charged to developed properties is only source of operational funds for public SWM



Regional SWM Study

- Regional stormwater facility
 - Large stormwater management solution
 - Situated and designed to serve multiple properties
 - Optimize stormwater management as part of a multi-phase or large development project or to facilitate redevelopment
- Regional stormwater strategy
 - Plan that addresses conveyance, water quantity control, and water quality treatment through a planned set of public, private, and/or public and private stormwater infrastructure
 - could include several types of solutions to manage runoff in a coordinated manner as opposed to site-by-site



Regional SWM Advantages

- Can support redevelopment and economic development
- Lower design and construction costs
- Reduced operation and maintenance costs
- Visibility
- Higher utilization of developable land
- Integration of stormwater solutions
- Community benefits



Summary

- Centralized on-site stormwater management is allowable under many circumstances, and the policy, procedural, and technical updates needed to support more frequent use of this pattern are relatively minor.
- ROW stormwater management is allowable under limited circumstances, but the City lacks a reimbursement mechanism for managing private runoff in the ROW and may lack procedural mechanisms for approving applications. ROW stormwater management is also complicated by possible utility conflicts and capacity of existing systems.
- Implementing regional SWM requires more study and could be useful in the Central Core and Midtown.
- Adding tools to the toolbox could reduce conflicts of stormwater management with increasing density.



Recommended Next Steps - Draft

- Policies and Procedures
 - Consider adding stormwater to pre-application materials
 - For infill housing, explore establishing a fee in lieu that would allow runoff to be managed in the ROW in a City-owned facility (BMC 16.50.040.A.4). Set a standard for eligibility, set other technical standards such as classification of the street, and research a fair cost.
 - Consider adopting the flexible stormwater options codified in seven master planned developments (BDC 2.7) for residential developments city-wide with a Type II administrative land division.
 - Coordinate with other departments and BURA to explore options for developing regional stormwater strategies for the Central Core, including the ongoing public improvements in Midtown, and other areas of City focus on economic development.

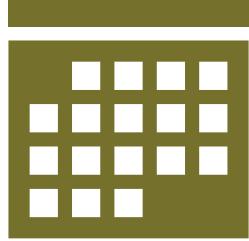


Recommended Next Steps - Draft

- Technical Standards
 - Establish standards for use of deep drywells and stormwater trees on private property and in ROW.
 - Establish criteria for demonstrating compliance with BMC 16.15.040A.4, 16.15.040.A.6, and 16.15.040.A.8 when centralized or ROW stormwater management options are proposed.
- Evaluate Tradeoffs
 - Further evaluate the impacts to funding, operation and maintenance workload, plan review procedures, and staffing if the City wishes to promote the available options for centralized on-site stormwater management and/or increase the options for centralized and ROW stormwater management.



Look ahead



May 7, 2025: Draft Stormwater Master Plan & Stormwater Standards Updates

11am-12:30pm Hybrid Meeting (Boyd Acres or MS Teams)

***Outcome:** Collect feedback on master plan and new standards.*

June 4, 2025: In-person Tour

11am-12:30pm Location TBD

**[bendoregon.gov/government/departments/
utilities/utilities-public-advisory-group](http://bendoregon.gov/government/departments/utilities/utilities-public-advisory-group)**



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Thank you!



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Accommodation Information for People with Disabilities



To obtain this information in an alternate format such as Braille, large print, electronic formats, etc. please contact Lori Faha at lfaha@bendoregon.gov or (541) 317-3025; Relay Users Dial 7-1-1.



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