CITY OF BEND

Water Advisory Group

May 7, 2025 • 11 am–12:30 pm

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

Lori Faha, P.E., Environmental Resources Manager
Austin Somheygi, P.E. Stormwater Master Plan Project Manager
Trista Kobluskie, Stormwater Master Plan Consultant Lead

Purpose & Agenda

Collect feedback on draft Stormwater Master Plan and Level of Service.

1. Welcome & Introductions
2. April Meeting Reflections
3. June Tour Information
4. Stormwater Master Plan Feedback
5. Discussion & Feedback
6. Summary & Closing

April meeting reflections: Water Rates

- Discussed Challenges, Benefits & Key Objectives for Evaluating Water Budget Based Rates
- Financial sufficiency, sustainability, regulatory compliance, affordability, predictability are all important
- Received Input on Questions For Other Utilities:
  - How do other agencies calculate and verify indoor water use, especially in areas with high vacancy rates?
  - What are the implementation and maintenance costs, including staffing needs, for managing water budgets?
  - How do other utilities approach funding reserve policies?
  - How do they find the balance between level of detail vs cost/complexity in the structure?
  - How to incorporate fairness, equity, affordability, simplicity?

- Water Utilities Interview List

1. Irvine Ranch, CA
2. East Bay Municipal District, CA
3. City of Santa Barbara, CA
4. Fort Collins Utilities, CO
5. Albuquerque, NM
6. Otay Water District, CA
7. San Antonio Water System, TX
8. Rancho California Water District, CA
9. Santa Fe, NM
10. Hillsboro, OR

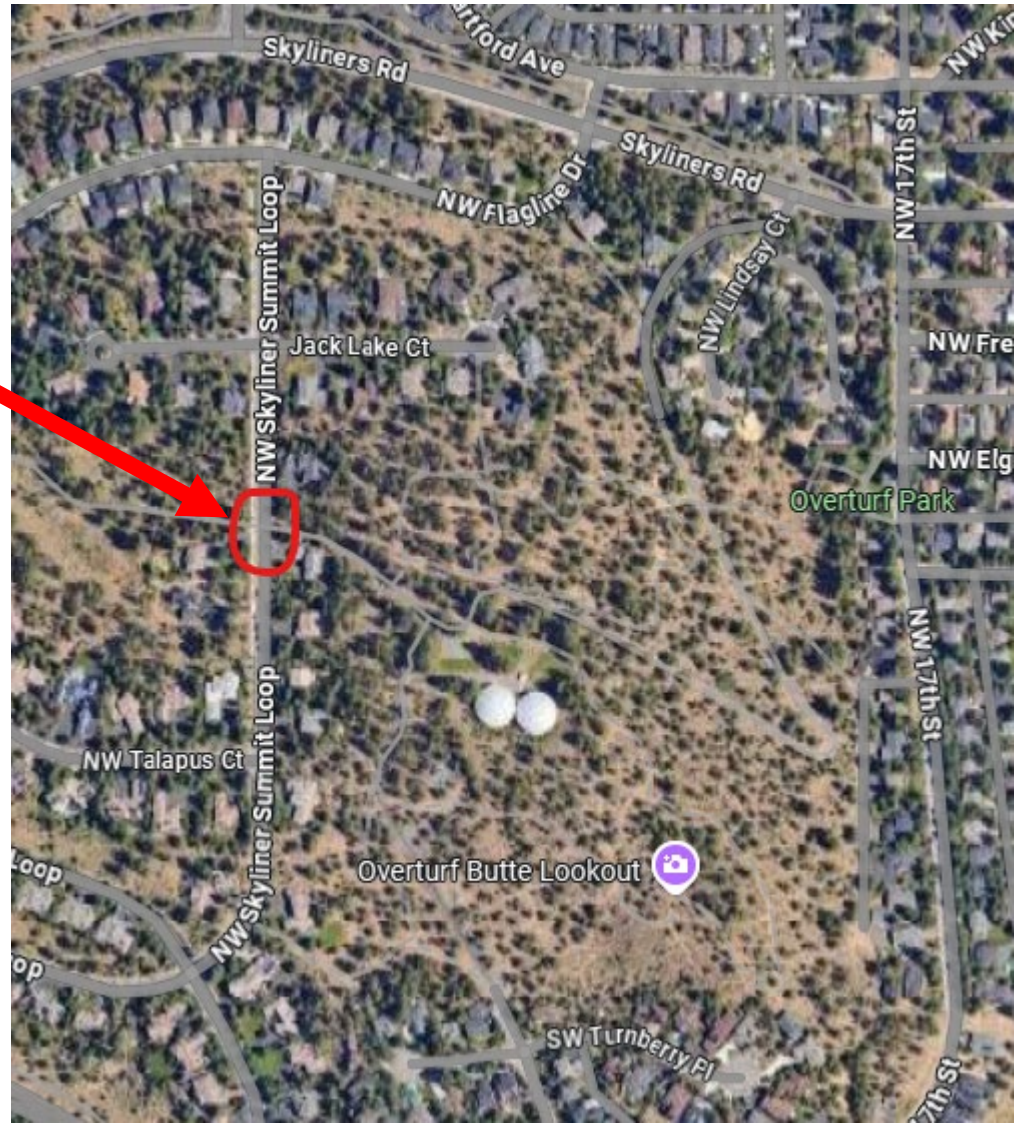
April Meeting Reflections: Drainage & Density

- If some private runoff will be managed in public facilities, consider the equity questions. There should be a technical feasibility reason to allow it.
- Examine impacts on monthly stormwater charge of allowing comingled facilities.
- Could stormwater charges be divided based on flow rate contributions to comingled facilities?

June 4 WAG Tour – Overturf Park

- 11 am tour start at NW Skyliner Summit Loop at the Cascade Highlands Trail
- Walking tour of City of Bend water site
- Topic: How to better integrate Firewise landscape management recommendations with goals for waterwise/native landscapes, erosion control and tree protection
- 12:30 pm lunch at the reservoir tanks

Look for more RSVP info soon!



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Stormwater Master Plan Recommendations and Adoption

Recap Planning Process

SMP Recommendations

Review & Adoption Process

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WAG focus questions

- Overall comments on the CIP projects.
- Does Bend's stormwater "level of service" fall below your expectations, meet your expectations, or exceed your expectations?
  - Key maintenance practices like street sweeping?
  - Addressing nuisance flooding concerns?
  - Thinking about water quality of the river?
  - Erosion control on construction sites?
  - Public education items?
- What is the strongest argument if the City would want to consider raising rates for stormwater?

Stormwater Master Plan Recap

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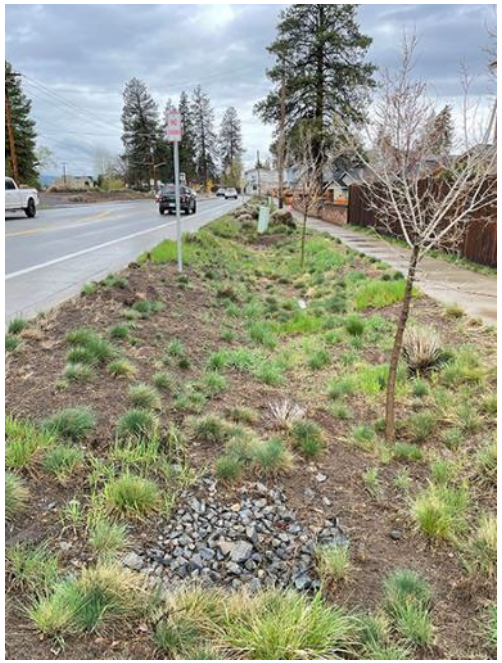
Stormwater Master Plan purpose and overview

- Update conveyance and drainage projects from 2014 Stormwater Master Plan
- Identify and assess new conveyance/drainage issues
- Create a long-term plan for reducing risk to groundwater from drill holes and drywells (UICs)
- Create a plan for improving the quality of runoff discharged to the Deschutes River through the City's outfalls
- Develop a capital program incorporating conveyance/drainage projects, UIC retrofits, and outfall retrofits

Stormwater Master Plan purpose and overview

- Review the state of the practice among stormwater utilities for climate change resilience
- Explore options for facilitating denser development, such as:
  - Allowing stormwater runoff from private properties to be managed in the rights-of-way
  - Considering regional stormwater management facilities – placement and necessary policies to support and fund



Stormwater Master Plan development and areas for WAG input

- Visioning – what is most important to you and the community?
- Visioning – what is the story of stormwater in Bend?
- Solution Priorities – how will we prioritize stormwater capital improvements?
- Policy Solutions – what are the opportunities and impediments to regional facilities?
- Policy Solutions – what are the opportunities and impediments to managing runoff from private properties in the rights-of-way?
- Policy Solutions – how much emphasis on climate change in the next SMP?

Project Timeline - Updated

At-a-glance

PLANNING

Define the project scope, objectives, and deliverables.

Communications planning.

Manage the project over time.

2024

Jan – Closeout

DISCOVERY

Intake data and reports.

Assess existing conditions & identify issues to be solved.

Study outfall retrofits.

Study drywells and drill holes.

Study climate change.

2024

Feb - Sept

VISIONING

Assess and document values surrounding stormwater and goals for plan among various groups, including staff, stakeholders, and community.

Use values and goals to prioritize issues, capital projects, and inform policy recommendations.

2024

Feb - Dec

SOLUTIONS

Select capital improvement projects (CIPs).

Develop CIP fact sheets.

Develop policy white papers.

2024 - 2025

Jun – Jun

IMPLEMENT

Write and deliver Stormwater MP.

Develop content for implementation tracking web page.

Final public review.

City Council adoption.

2025

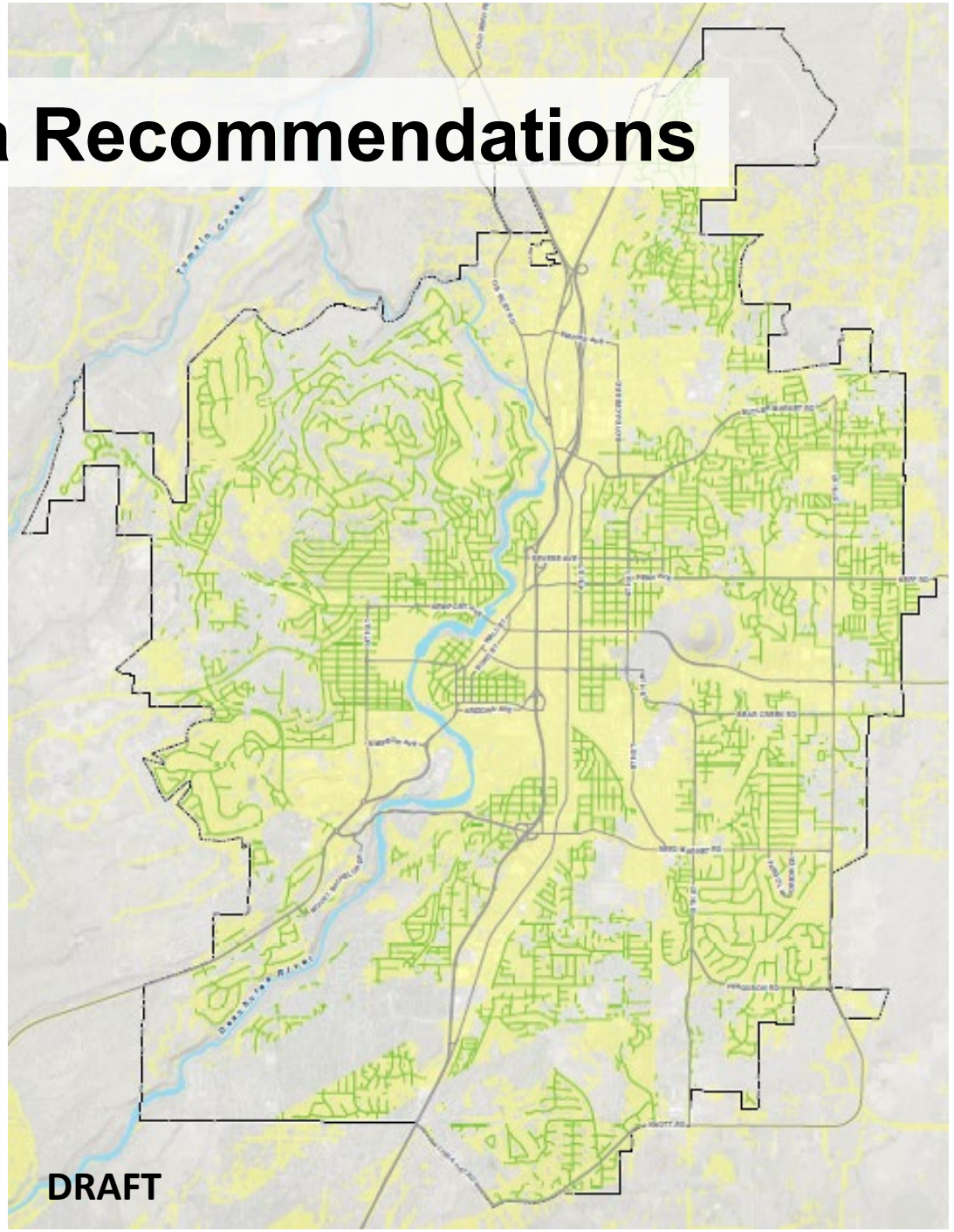
May – Sept

UIC Priorities

Recommendations

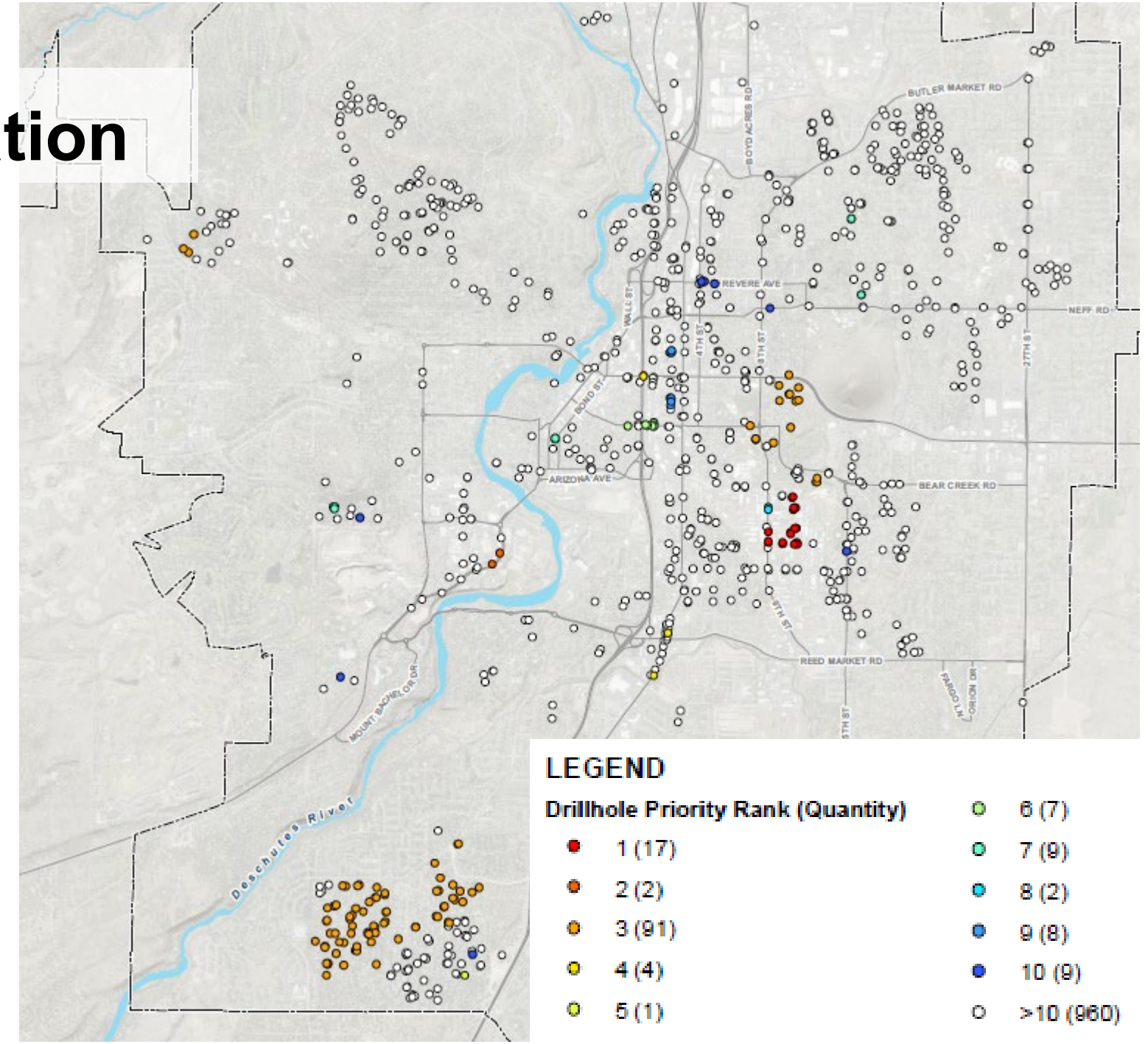
Modified Drywell Siting Criteria Recommendations

- Modified Drywell = Deep Drywell
  - Can reach 100+ feet
- The SMP will recommend allowing deep drywells where there is sufficient vertical separation to groundwater and where likelihood of pollution is low (green)



Drillhole Prioritization

- Drillholes that may pose a risk to groundwater were prioritized
- 17 were identified as highest risk
- The SMP will recommend decommissioning or retrofitting these over a 5 to 10-year period
- Costs are still being developed for this program



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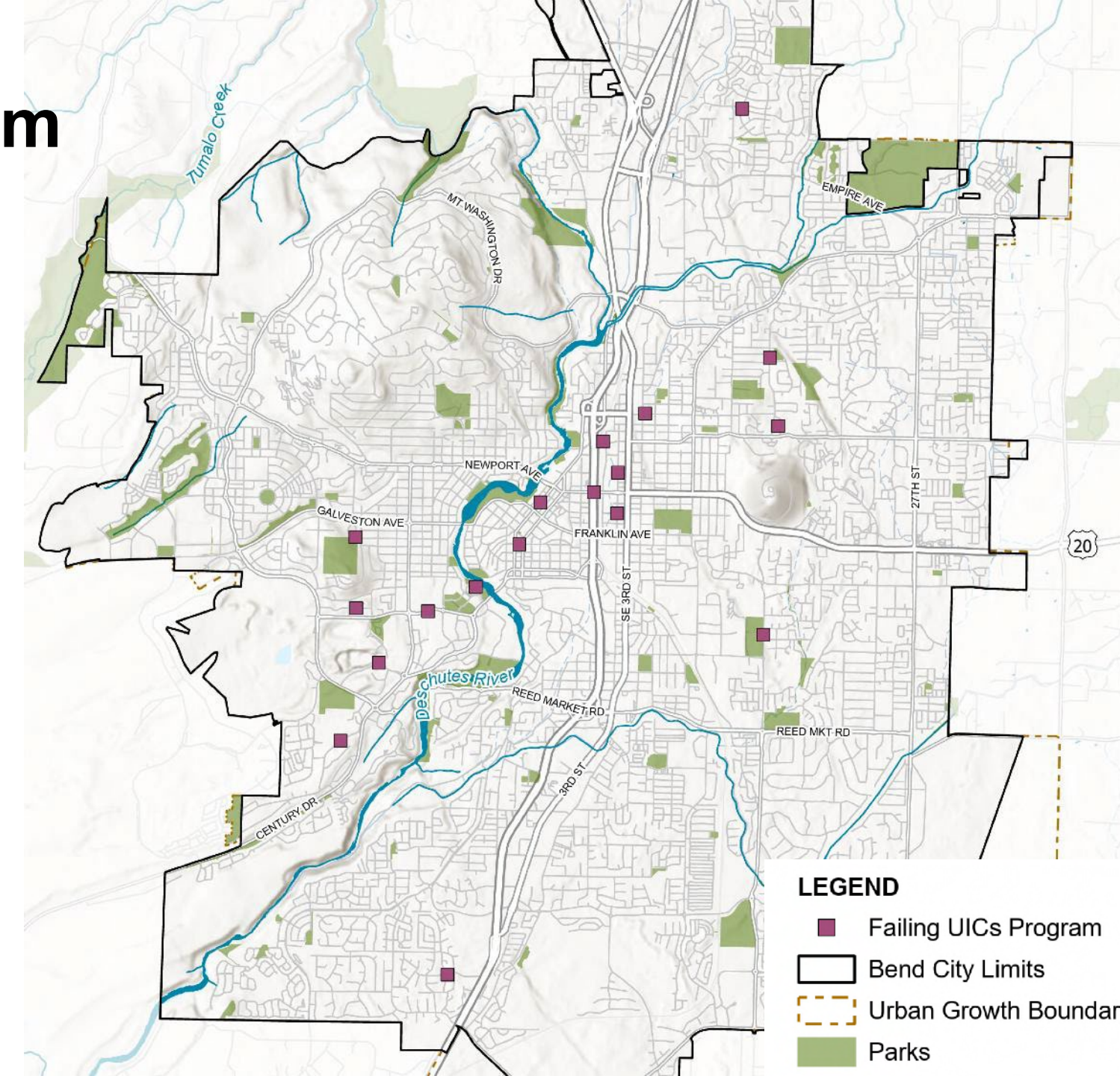
Failing UICs Program

- The City's failing UICs often have a simple solution of replacing the UIC with a new drywell or removing fouled drain rock from a drywell and replacing it.
- The two options cost about the same.
- The SMP identified 18 failing UICs.
- These may be addressed with the existing "Major Maintenance" annual line item.



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Capital Improvement

Recommendations and Costs

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Capital Project Prioritization

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Prioritization Criteria Category Scores

Category	Maximum Score
Conveyance and Flooding	20
Water Quality Improvements	20
Multiple Benefits	20
Recognized Priority Projects	10
Feasibility and Cost	10
Total Points Available	**80**

Ranked Projects

ID	Project Name	Type	Total	Rank
35	Riverfront Street Stormwater Outfall 128 Retrofit and Drainage Improvements	Retrofit	*51.0*	1
42	Downtown Pedestrian Safety Drainage Improvements	Drainage	*45.5*	2
44	Drake Park Stormwater Outfall 018 Retrofit and Pipe Repair	Retrofit	*36.0*	3
14	Congress Street Drainage Improvements	Drainage	*34.0*	4
46	Vicksburg Avenue Drainage Improvements	Drainage	*34.0*	4
47	Galveston Stormwater Outfall 020 Retrofit	Retrofit	*33.0*	6
48	Fresno Ave Stormwater Outfall 020 Retrofit & Drainage	Retrofit	*32.5*	7
12	Columbia Park Outfall 024 Retrofit	Retrofit	*29.5*	8
45	12th Street Stormwater Outfall 024 Retrofit	Retrofit	*28.5*	9
1	Dove Lane Drainage Improvements	Drainage	*27.5*	10
43	Saginaw Avenue Stormwater Outfall 013 Retrofit	Retrofit	*26.0*	11
16	Campbell Road Drainage Improvements	Drainage	*23.0*	12

Example Project Fact Sheet

Outfall 128 Retrofit & NW Riverfront Street Drainage Improvement

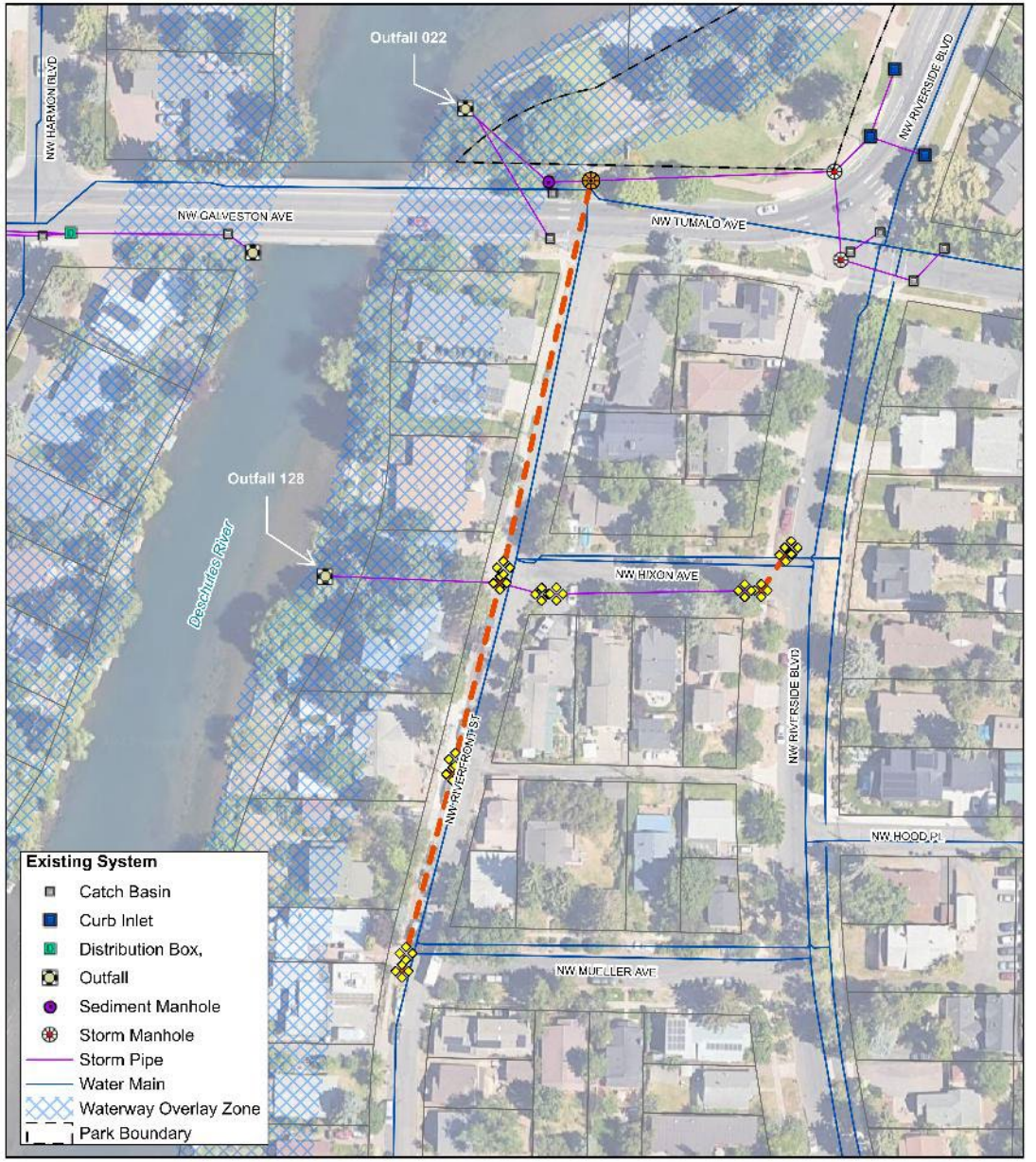
Capital Improvement Project Fact Sheet

Location	**NW Riverfront St & NW Hixon Ave**		
ID	**PP-35**	*Rank*	**1**

Photos of Project Area

NW Riverside looking east down NW Hixon

NW Hixon looking north down NW Riverside



BEND STORMWATER MASTER PLAN

Proposed Improvements

- Proprietary Filter System
- Manhole
- Storm Sewer Pipe

0 50 100 150 Feet

PP-35: Outfall 128 Retrofit and NW Riverfront Street Drainage Improvement

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Example Tool Kit Fact Sheet

Description

Deep Drywell is a subsurface concrete structure with an integrated pre-treatment device and a drilled shaft extending up to 100 feet underground. The purpose of this tool is to prevent localized flooding by collecting runoff from streets and other surfaces. Integrated pre-treatment protects the shaft from sedimentation and protects groundwater quality.

Deep Drywells manage runoff by allowing stormwater to soak into the ground, filtering stormwater through the soil, and recharging groundwater. Deep Drywells are regulated as "Class V Injection Wells" under the federal Safe Drinking Water Act.

Compared to typical drywells, Deep Drywell manages stormwater in a smaller footprint. Because they require drilling equipment and extend deep into the ground, careful siting is necessary to avoid overhead utilities and prevent groundwater contamination.

Uses

Deep Drywells are best used in the following situations:

- Areas with poor infiltration rates at shallow depths, but excellent infiltration capacity at greater depths
- Away from drinking water wells
- Away from areas where pollutants from industry, railroads, and high-traffic roads are present

Benefits

The benefits include:

- Reduce localized flooding
- Integrated pre-treatment is space-efficient
- Groundwater recharge
- Allow development where a municipal storm conveyance system is lacking
- Manage runoff in a smaller footprint than typical drywells

Maintenance needs for Deep Drywells are limited. Periodic inspection is recommended to ensure proper function. Typical maintenance includes removing debris, unclogging inlets, and removing sediment from the sump.

Images (clockwise from top):

1. Drilling deep drywell in Bend
2. Deep drywell installation in progress
3. Completed deep drywell after road surface restoration

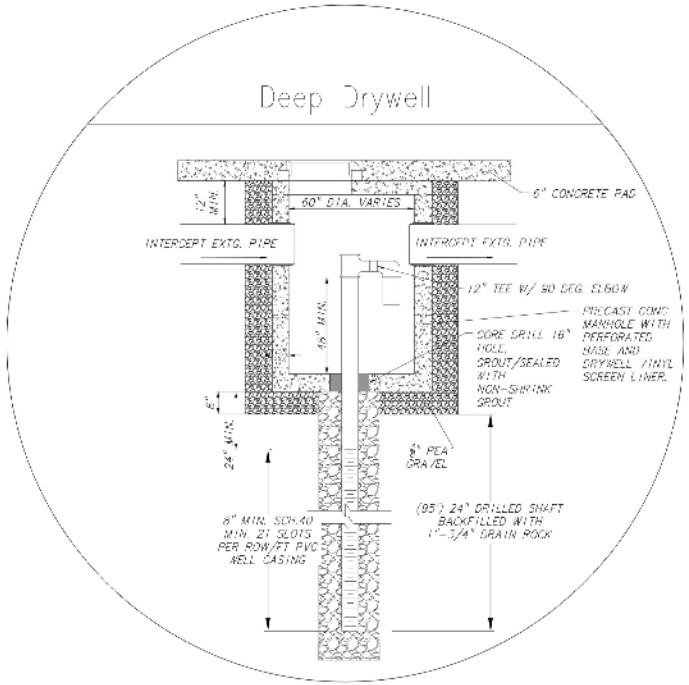
Deep Drywell

Stormwater Tool Kit Fact Sheet

› Drywell is each installed

d for one deep drywell with a 60-ıtegrated pre-treatment, with an deep drilled shaft.

		Unit	Unit Price	Amount
		CY	$150	$4,500
		CY	$120	$1,080
		CY	$120	$1,200
		EA	$14,700	$14,700
		LF	$500	$47,500
12-in Tee with 90 Deg. Elbow	1	EA	$1,050	$1,050
6-in Concrete Pad	1	EA	$2,000	$2,000
Misc. Items	1	EA	$2,500	$2,500
Total				**$74,530**
Per Deep Drywell (Rounded)				**$75,000**



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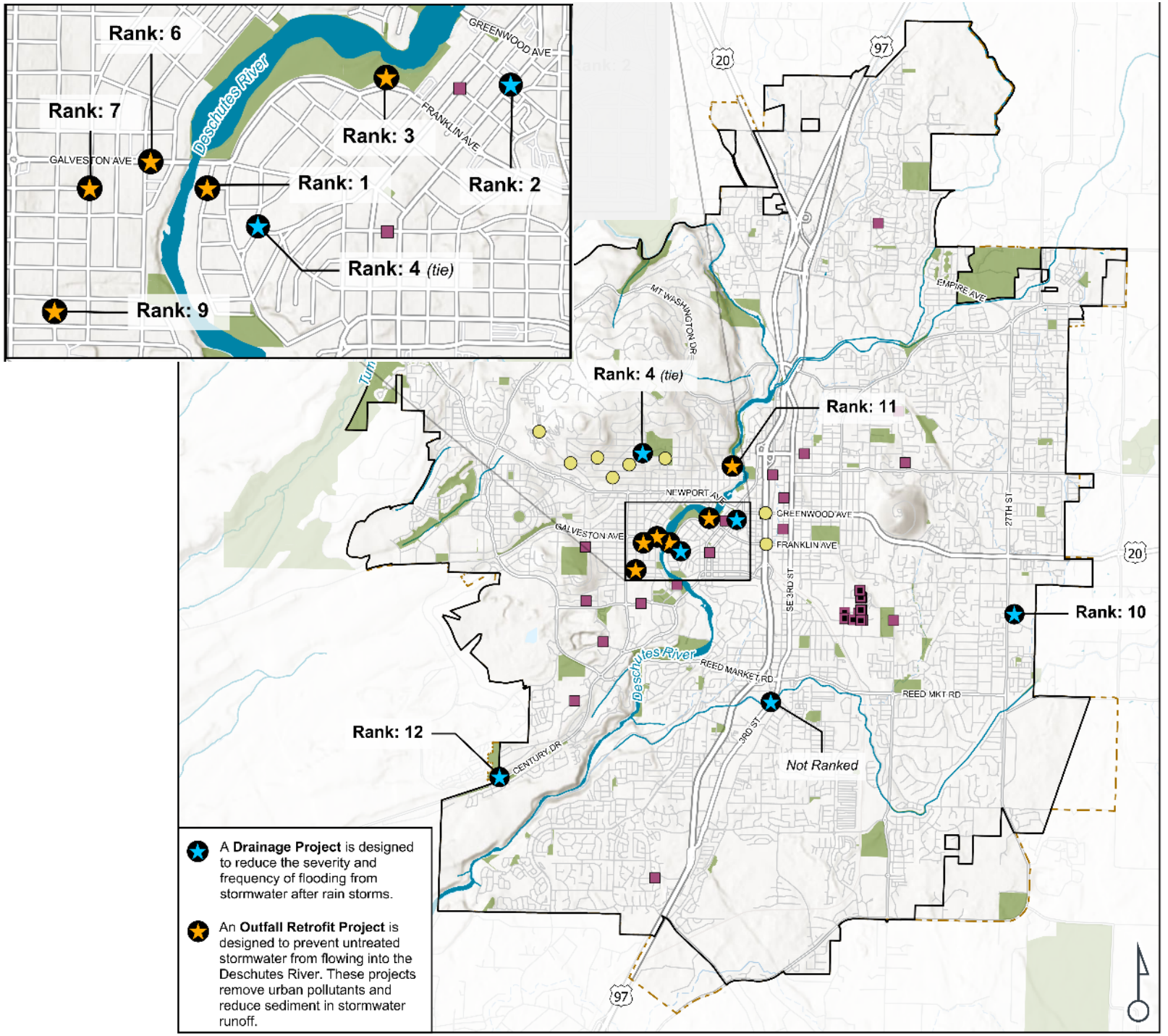
CIP Map

- New Capital Projects
- In Progress Stormwater Capital
- UIC Priorities



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Project Cost Summary – First Draft

Rank	PP-ID	Project Name	Cost (2025 $)
1	PP-35	Riverfront Street Stormwater Outfall 128 Retrofit and Drainage Improvements	$ 930,000
2	PP-42	Downtown Pedestrian Safety Drainage Improvements	$ 800,000
3	PP-44	Drake Park Stormwater Outfall 018 Retrofit and Pipe Repair	$ 4,350,000
4	PP-14	Congress Street Drainage Improvements	$ 1,540,000
4*	PP-46	Vicksburg Drainage Improvements	$ 148,000
6	PP-47	Galveston Stormwater Outfall 020 Retrofit	$ 6,110,000
7	PP-48	Fresno Avenue Outfall 020 Retrofit & Neighborhood Drainage	$ 4,100,000
9**	PP-45	12th Street Stormwater Outfall 024 Retrofit	$ 990,000
10	PP-1	Dove Lane Drainage Improvements	$ 420,000
11	PP-43	Saginaw Avenue Stormwater Outfall 013 Retrofit	$ 2,770,000
12	PP-16	Campbell Road Drainage Improvements	$ 170,000
		Total	**$ 22,328,000**

* There was a tie for 4th place, so there is no 5th place.

** The 8th place project was later removed from consideration because we learned it is infeasible after discussing options with Bend Park and Recreation District.

WAG focus question

- Overall comments on the CIP?

Policy Recommendations

Climate Change

Drainage and Density

Level of Service

Projected Climate Changes in Bend

Increases (~6%) in overall annual precipitation by 2100	Less precipitation: April – October More precipitation: December – March More rain and less snow in winter
Increase in frequency and intensity of storms	Especially during winter months Increased intensity of atmospheric rivers
Decline in snowpack	Decrease in overall mountain snowpack Earlier snowmelt means decreased streamflow in summer
Increased severity and duration of drought	Increased annual number of dry days (from 186 in 1990s to 192 by 2050)

Source: Oregon Watershed Enhancement Board. (September 2023). *Region 4 Observed & Projected Climate Changes.* https://www.oregon.gov/oweb/Documents/climate-R4-variables.pdf

Climate Change Challenges to Bend's Stormwater System

Inappropriately sized design storms for existing conditions

Climate change causing increased intensity and frequency of storm events

Drier summer impacts on water quality

Sedimentation from winter road sanding

Winter precipitation and ice storms clogging drain inlets and causing flooding

Increasing rapid urban development exacerbating impacts

Climate Change – Takeaways & Recommendations

- Build accurate historical rainfall data:
  - Increase data collection with more gauges
  - Build a robust monitoring network.
- Integrate climate change precipitation with downscaled data
- Update design standards; requires time, expertise, and resources.
- An interim approach and prioritization of key projects based on city objectives can help where resources are limited.
- Combine multiple approaches, both quantitative and qualitative.
- Work regionally, across jurisdictions, with universities and Federal agencies to pool resources and coordinate research.
- The science and data is continually evolving and improving. Now is the time to begin!

Drainage & Density Draft Findings 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.

Drainage & Density Examples

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Drainage & 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.

Drainage & Density - 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.

Level of Service

Drainage Response

Maintenance & Repair

Vegetation Management

Inspection

Water Quality

Capital Programs Implementation

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Level of Service

- What is level of service?
- What is Bend's current level of service for stormwater management?
- What are the tradeoffs for higher and lower levels of service?
- Which facilities should be publicly maintained?
- What are the next steps?
- When will funding be reviewed?

WAG focus question - survey

- Does Bend's stormwater "level of service" fall below your expectations, meet your expectations, or exceed your expectations?
  - Key maintenance practices like street sweeping?
  - Addressing nuisance flooding concerns?
  - Thinking about water quality of the river?
  - Erosion control on construction sites?
  - Public education items?

Stormwater Master Plan

Next Steps and Adoption

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Draft Stormwater Master Plan

- Drainage & Density and LOS Recommendations finalized
- Draft plan to be submitted summer 2025
- Will be circulated to WAG
- Available on web site

Adoption and Implementation

- City Council presentation & adoption in fall
- 2026 Fiscal Year EIPD capital budget (draft request) already includes some of the capital priorities to be recommended in the plan
- Begin budgeting for policy recommendations and continued study, where needed
- Begin rate study in late summer
- Permanent SMP web site with implementation tracking

WAG focus question

- What is the strongest argument if the City would want to consider raising rates for stormwater?

Look ahead

June 4, 2025: In-person Tour
11am-12:30pm Overturf Park

Outcome: *See and discuss practices and standards in the field. Discuss how to better integrate Firewise landscape management with goals for water conservation, native landscapes, erosion control, tree protection.*

July-August, 2025: Summer Break

September 3 & October 1, 2025
11am-12:30pm Hybrid Meetings (Boyd Acres or MS Teams)

November 5, 2025

11am-12:30pm New Public Works Building location!!

Thank you!

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.