

working for clean rivers



Stormwater Management with Green Infrastructure



ENVIRONMENTAL SERVICES
CITY OF PORTLAND

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Bureau of Environmental Services

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Follow up to the March PSC Meeting

Staff presented to PSC on March 11, 2014

- Managing stormwater is an essential part of city function and infrastructure
- Primary issues:
 - too much, too fast, too dirty
- Serious problems result if stormwater isn't managed:
 - surface flooding / sewer backups
 - erosion / loss of habitat
 - landslides
 - water quality regulations
- Stormwater management can be challenging!



Purpose of today's presentation

- What is green infrastructure in Portland
- Why it's a valuable tool in the stormwater management toolbox
- How it's integrated into public and private development
- What we know about performance and cost
- Where do we go from here



What is Green Infrastructure?

Natural resources or engineered vegetated facilities – that protect, support, or mimic natural systems to provide stormwater management, water quality, public health and safety, open space, and other complementary ecosystem services.



Why Green Infrastructure?

- Stormwater management – volume, rate, and water quality all at once
- Can provide flexibility
- Lower life cycle costs
- Multiple Benefits:
 - human health: air quality, urban heat island, access to nature
 - habitat, groundwater recharge, extend asset life, ...
 - partnerships: with other City bureaus, agencies



How we use Green Infrastructure

Green Streets



How we use Green Infrastructure

Parking Lots



Oregon Zoo



Holladay Park



RiverEast



Mt. Tabor Middle School



How we use Green Infrastructure

Green Roofs



Ramona Apartments



SW 1st & Main



South Waterfront



How we use Green Infrastructure

Urban Canopy



SE Clay Street



SE Clay Street



SE Sandy & 9th



How we use Green Infrastructure

Natural Systems



Foster Floodplain



How we use Green Infrastructure

Habitat Restoration

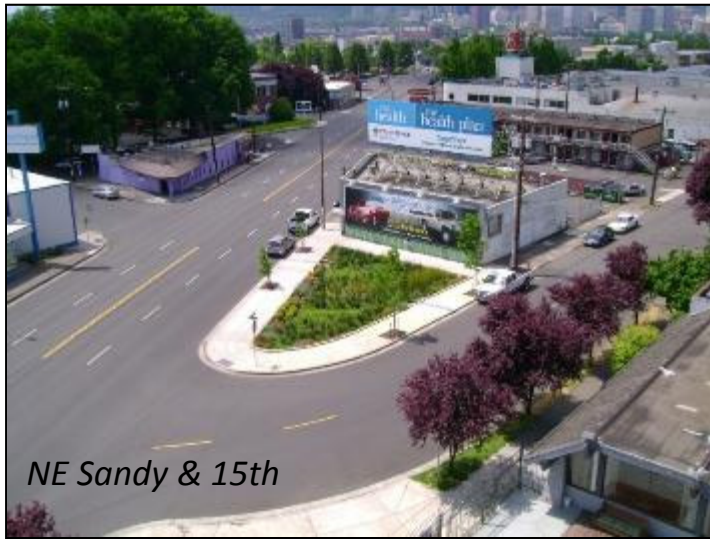


*Crystal Springs,
Tenino Culvert*



How we use Green Infrastructure

Green Streets & Safety



NE Sandy & 15th



SE Spokane & 13th



Laurelhurst Elementary



SE Belmont & 42nd



How we use Green Infrastructure

Space Constraints



SE Caruthers

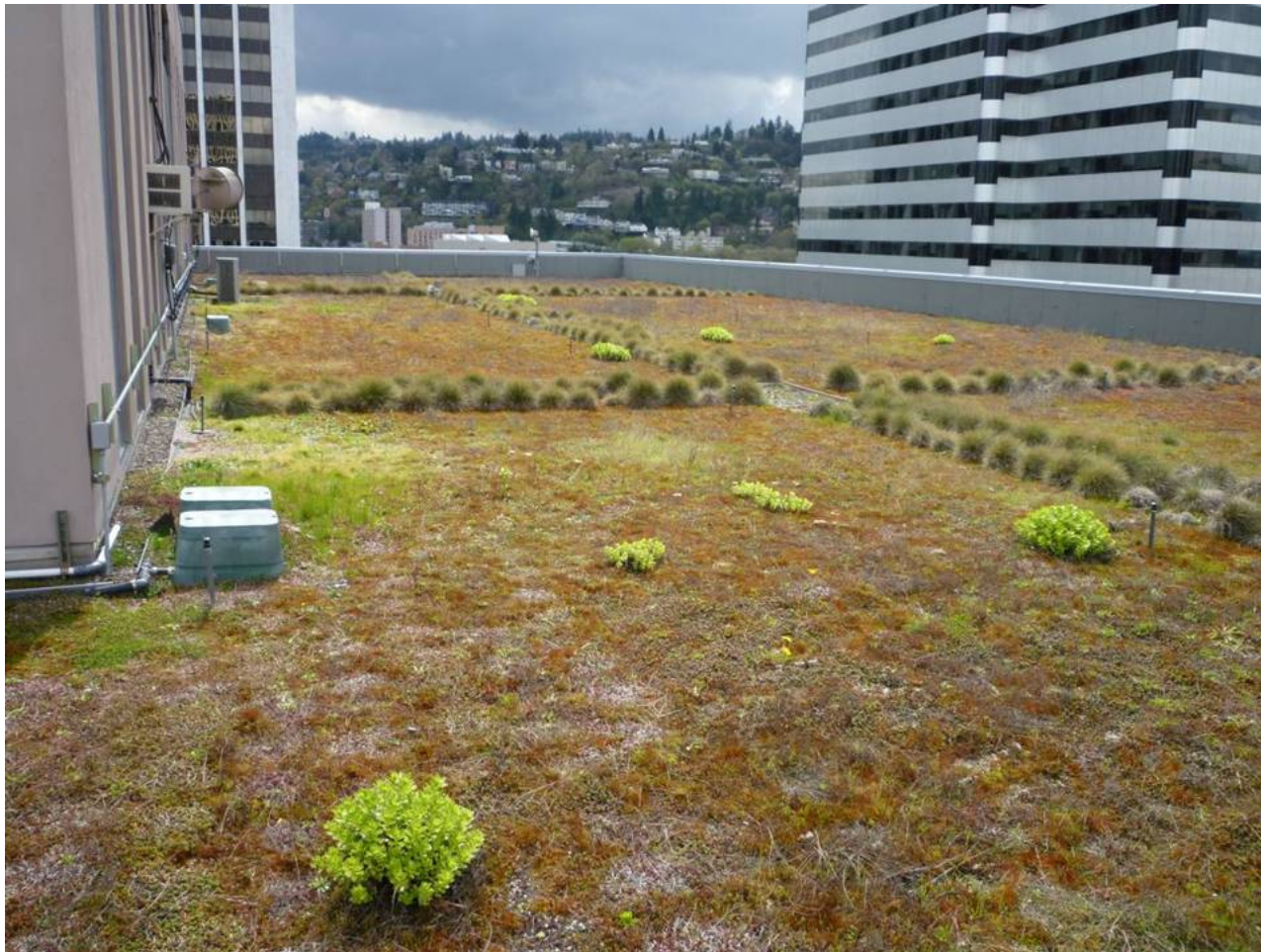


NE Davis



The Impact of Green Infrastructure

Green Roofs



Portland Building



The Impact of Green Infrastructure

Innovation – Stormwater Green Wall



The Impact of Green Infrastructure

Placemaking



Albina Triangle



The Impact of Green Infrastructure

Integrated Stormwater Management



The Impact of Green Infrastructure

Integrated Stormwater Management



RiverEast Center



The Impact of Green Infrastructure

Placemaking



NE Holman Park

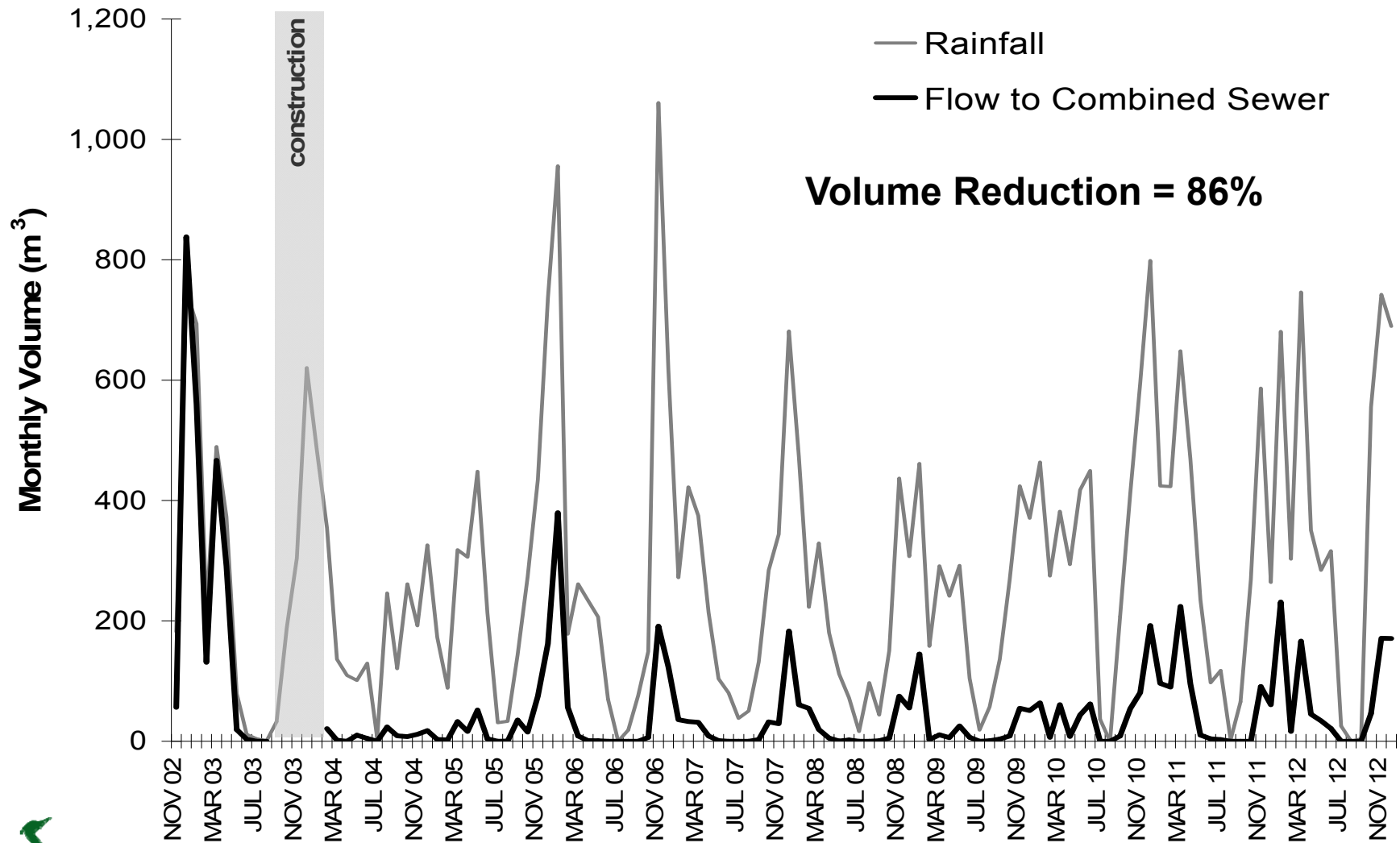


How well does Green Infrastructure work?

Performance Monitoring



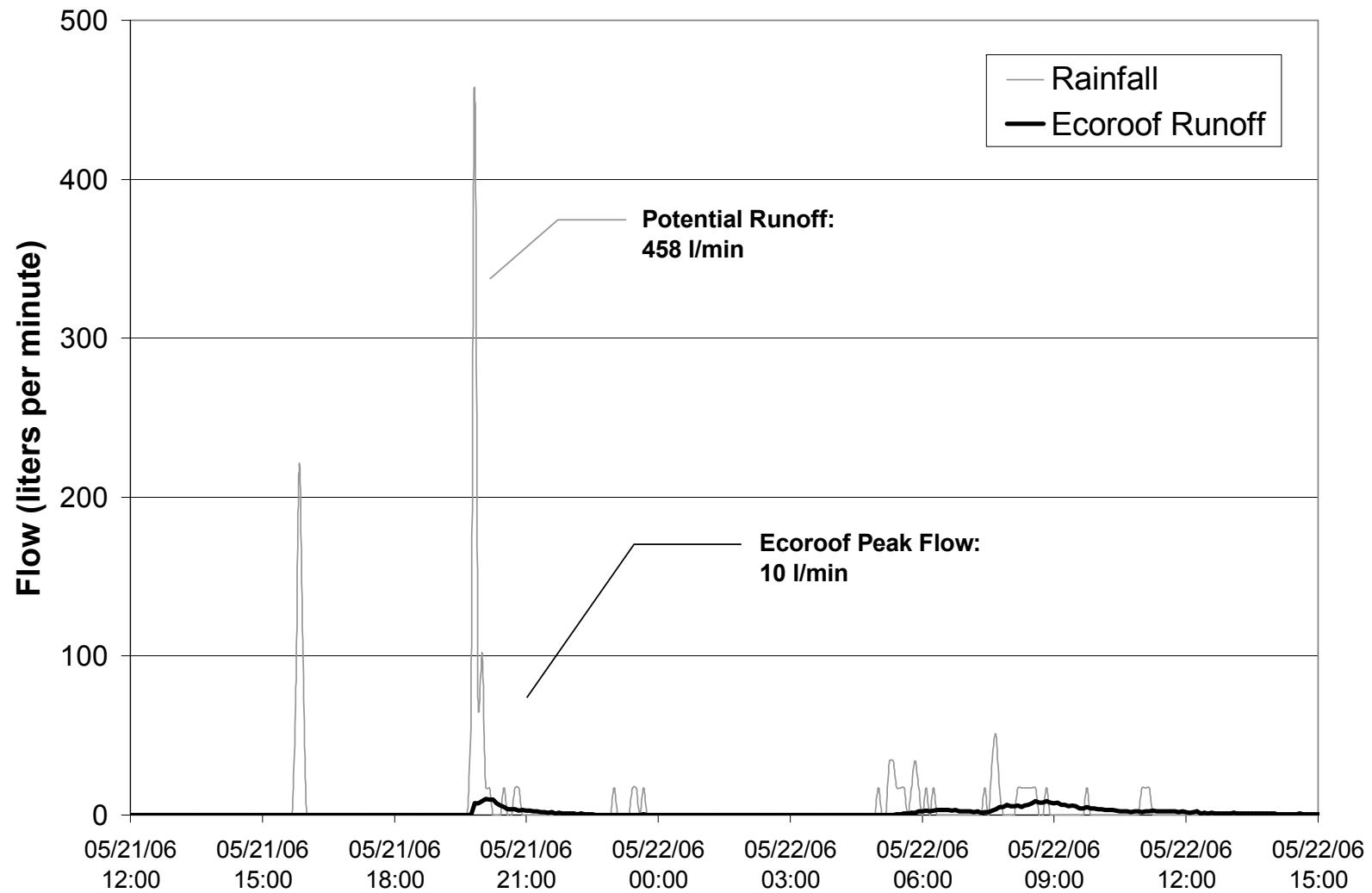
How well does Green Infrastructure work?



Glencoe Elementary Rain Garden



How well does Green Infrastructure work?



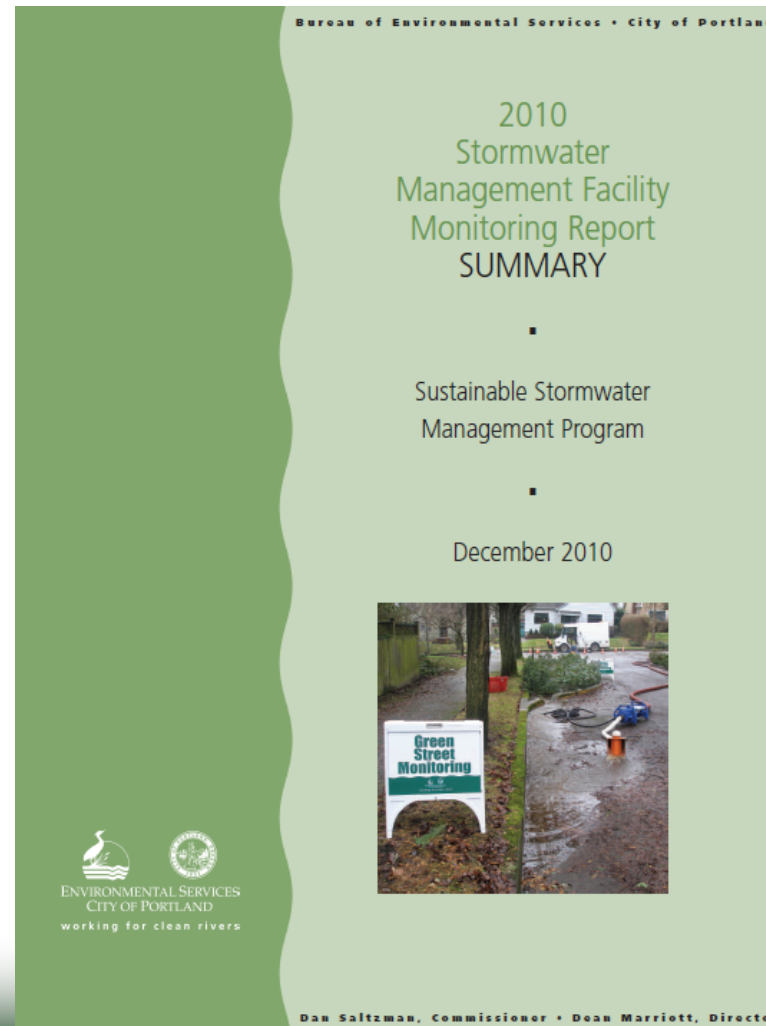
Hamilton Apartments Ecoroof



How well does Green Infrastructure work?

www.portlandoregon.gov/bes/sustainablestormwater

“Monitoring”



Business Case for Green Infrastructure

- OMSI Parking Lots



Swales were \$78,000 cheaper than traditional catch basins and pipes



Business Case for Green Infrastructure

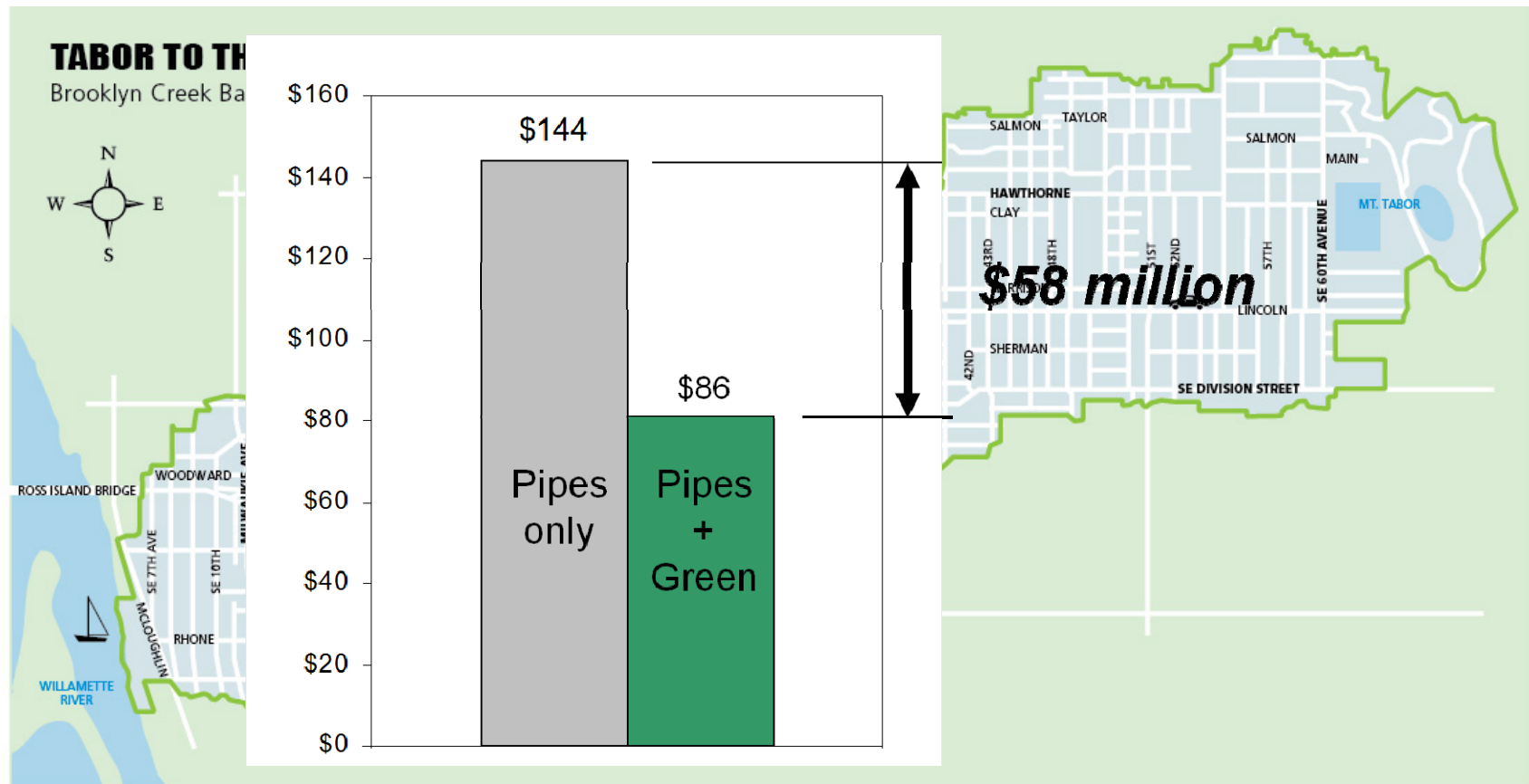
- Downspout Disconnection (CSO Program)

- 1993 – 2011
- \$13M program
- Saved >\$200M in tunnel costs



Business Case for Green Infrastructure

- Tabor to the River



Business Case for Green Infrastructure

- Tryon Headwaters (SW 30th & Dolph)



Looking Forward

Leadership & Opportunities

“Portland was one of the first cities we looked at as models for us. What I saw in Portland made me think about Philadelphia, in that yes, we can do this” (Howard Neukrug, the Philadelphia Water Department commissioner; *Water Blues, Green Solutions*)

We're not done yet

- Continued monitoring / innovation
- Stormwater System Planning
- Central City 2035 / Mixed Use Zoning Project
- Climate Action Plan / Preparation Strategy



Looking Forward

Working together

- Green infrastructure work crosses discipline and Bureau boundaries
- Integrated planning results in better, smarter development and infrastructure





Thank You!