

National Academies Urban Sustainability Workshop

WATER AT THE RIGHT SCALE



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ZGF
ZIMMER GUNSUL FRASCA ARCHITECTS LLP



- Water Systems
- Urban Areas



BICYCLING
自行车



OPEN AIR
STREET CAFES
室外咖啡



SAFE STREETS
FOR CHILDREN
儿童安全的街道



WALKABILITY
易于步行



STRONG
RETAIL BASE
繁华的底商



STORMWATER
MANAGEMENT
雨水收集管理系统



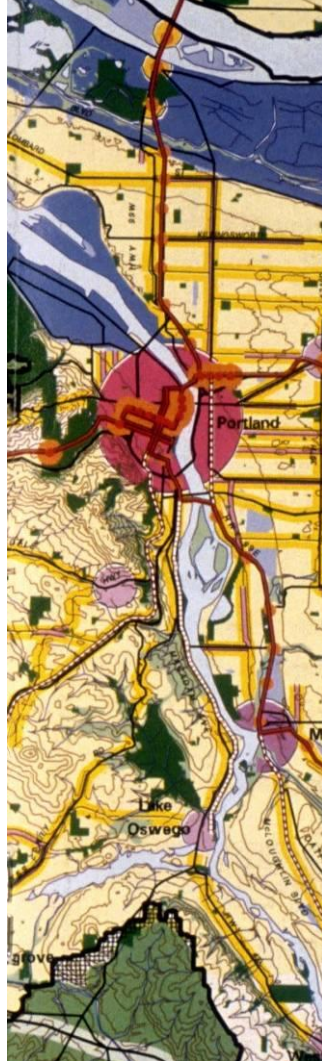
PUBLIC TRANSIT
公交系统

Water

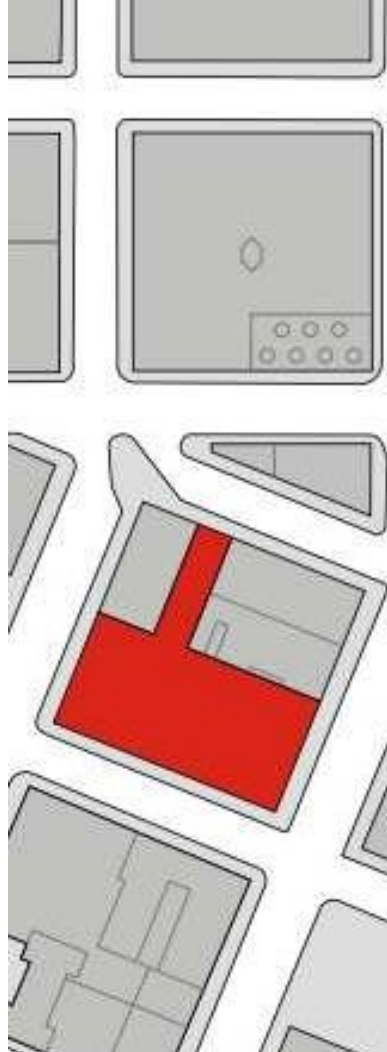
Mega City



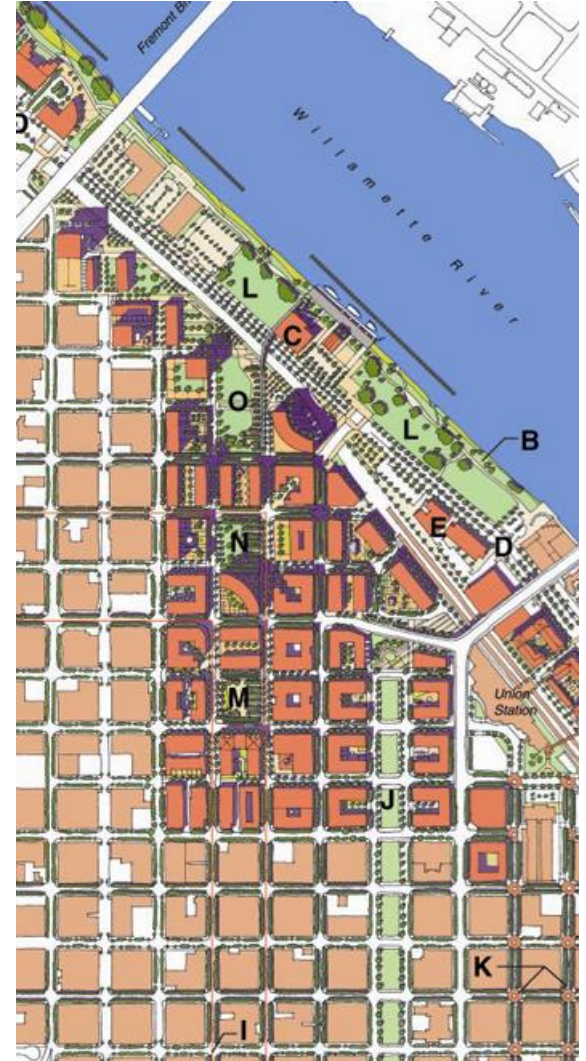
Region



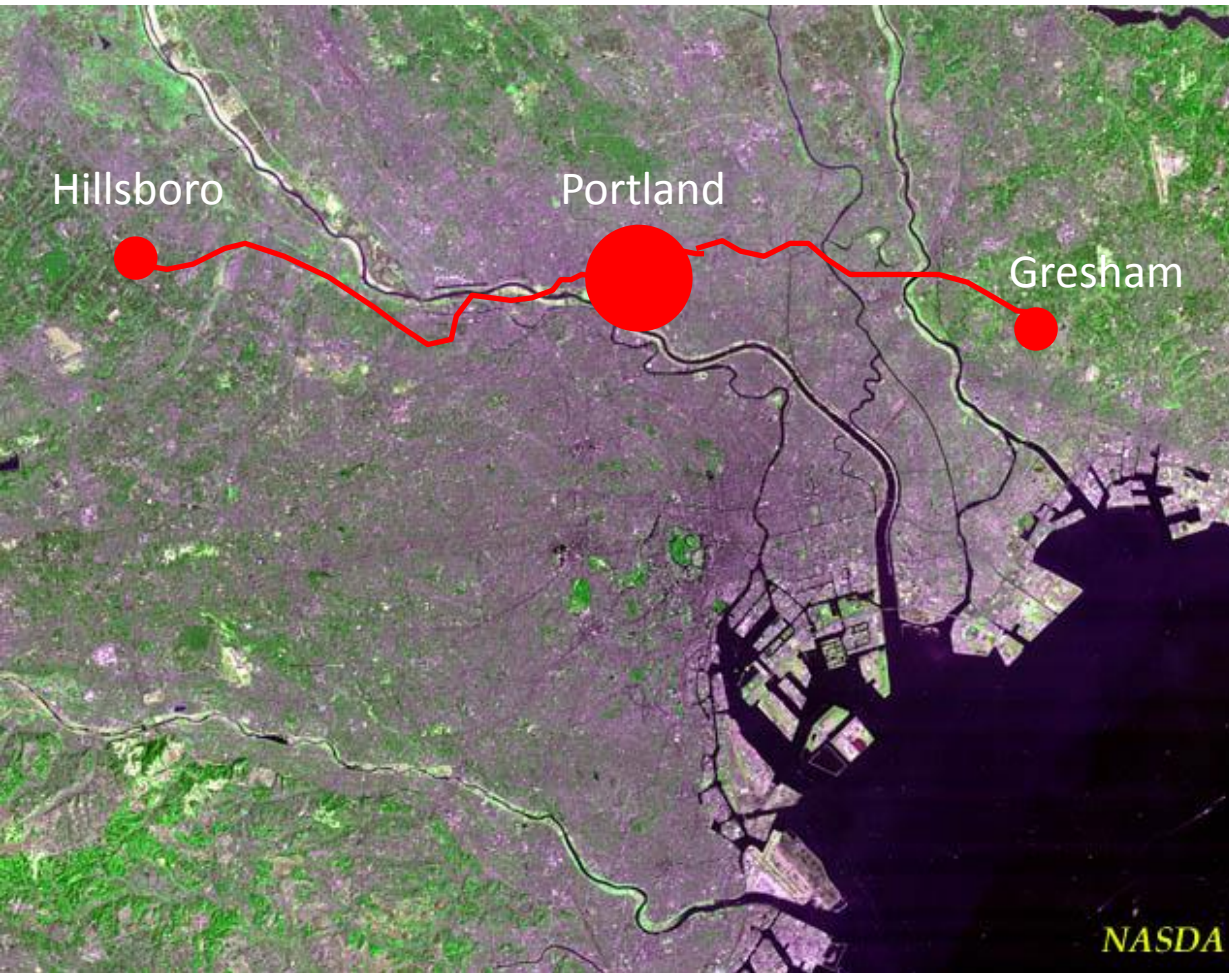
Block



District



Scale Comparison



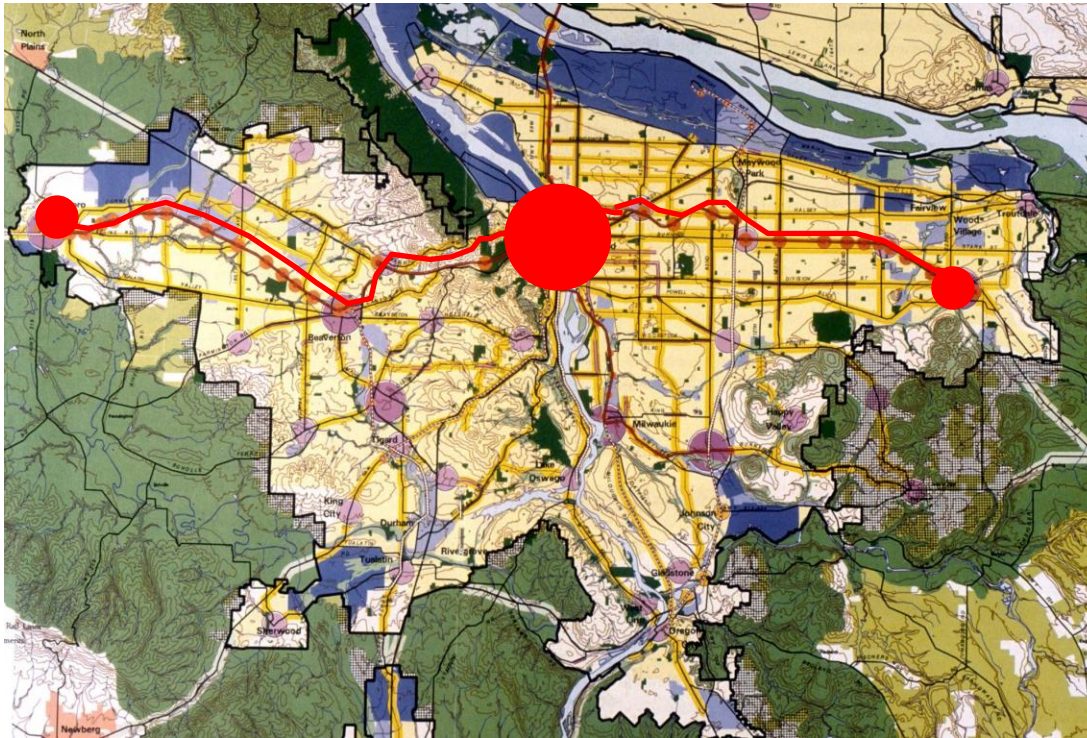
Opportunity

- Multiple Sources
- High Density
- Self Financed
- Resilience

Pathway

- Value of Moving from Grey to Green
- Value of connecting disconnected natural systems.

Mega City Scale: Tokyo



Hillsboro

Portland

Gresham

Opportunity

- Upstream resource conservation
- Coordinated best management practices with bricks and mortar improvements.

Pathway

- Value of municipal compliance with state and federal goals and policies –not regulation focused.
- Value of collective action in and between watersheds.

Regional Scale: Metro



Opportunity

- Stormwater Collection and Reuse
- Leverage Private Investment

Pathway

- Value of avoided utility costs in the future.
- Value of coherent municipal permitting

Block Scale: 12 West



District Scale: Southwest Ecodistrict

Opportunity

- Density and Subscribers
- Stormwater best management practices.
- Maximize Stormwater Collection and Reuse

Pathway

- Value of a micro scaled water utility to a regional Water Utility.
- Value of waste water treatment for potable water use.



**Flow Through
Swale**
20% Reduction



**Flow Through
Planter**
20% Reduction



Roof Intensive
40% Reduction



Roof Extensive
100% Reduction



Tree Reduction
15 cf/year



Impervious
0% Reduction



Compacted
20% Reduction



Natural
40% Reduction

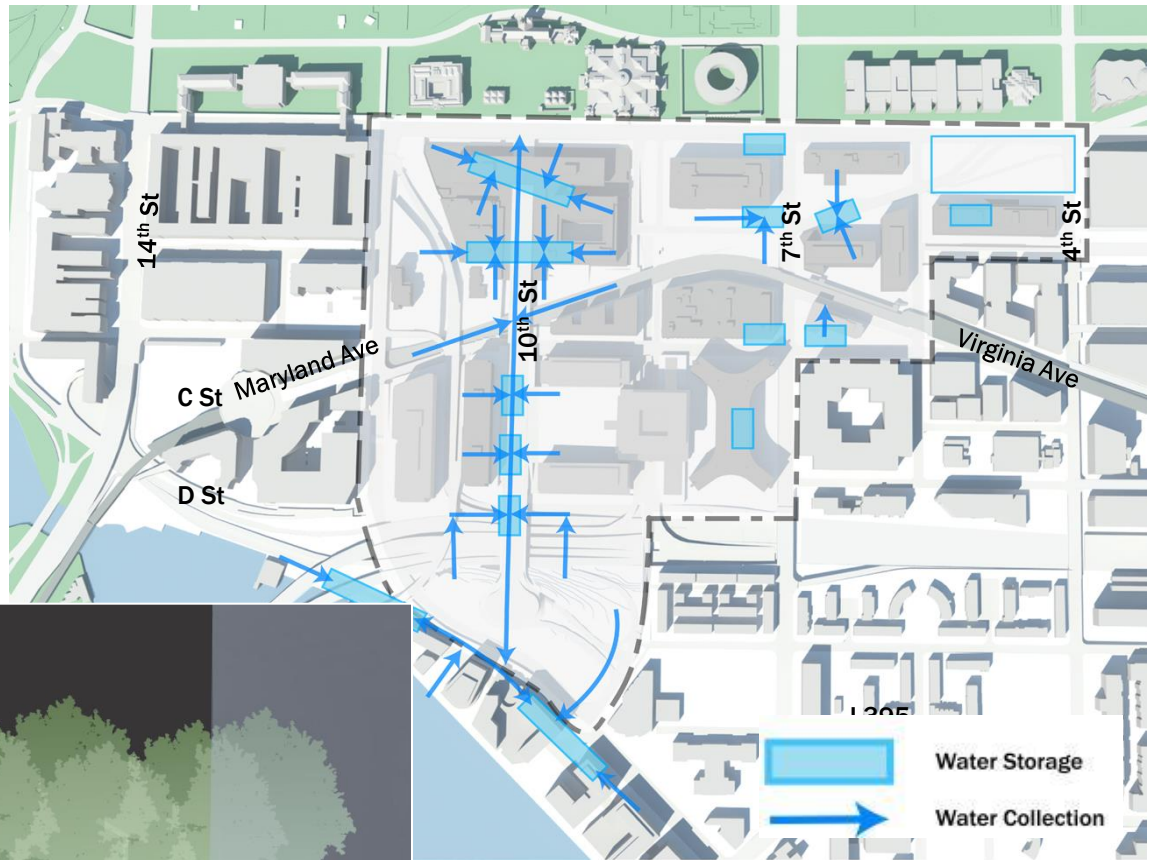


Based on DDOE Stormwater Guidebook

District Scale: Green Infrastructure



Large tanks (under 10th Street) could hold enough reclaimed water to provide 70% of the total water used in the SW Ecodistrict.



10th Street Cross Section with below ground tanks



District Scale: Southwest Ecodistrict

- Civilizing Transit



L'enfant intermodal station

- A High Performance Street



10th Street, SW

RESEARCH NEEDED TO ADVANCE TECHNOLOGY AT DISTRICT SCALE

Research that leads to pathways for implementation

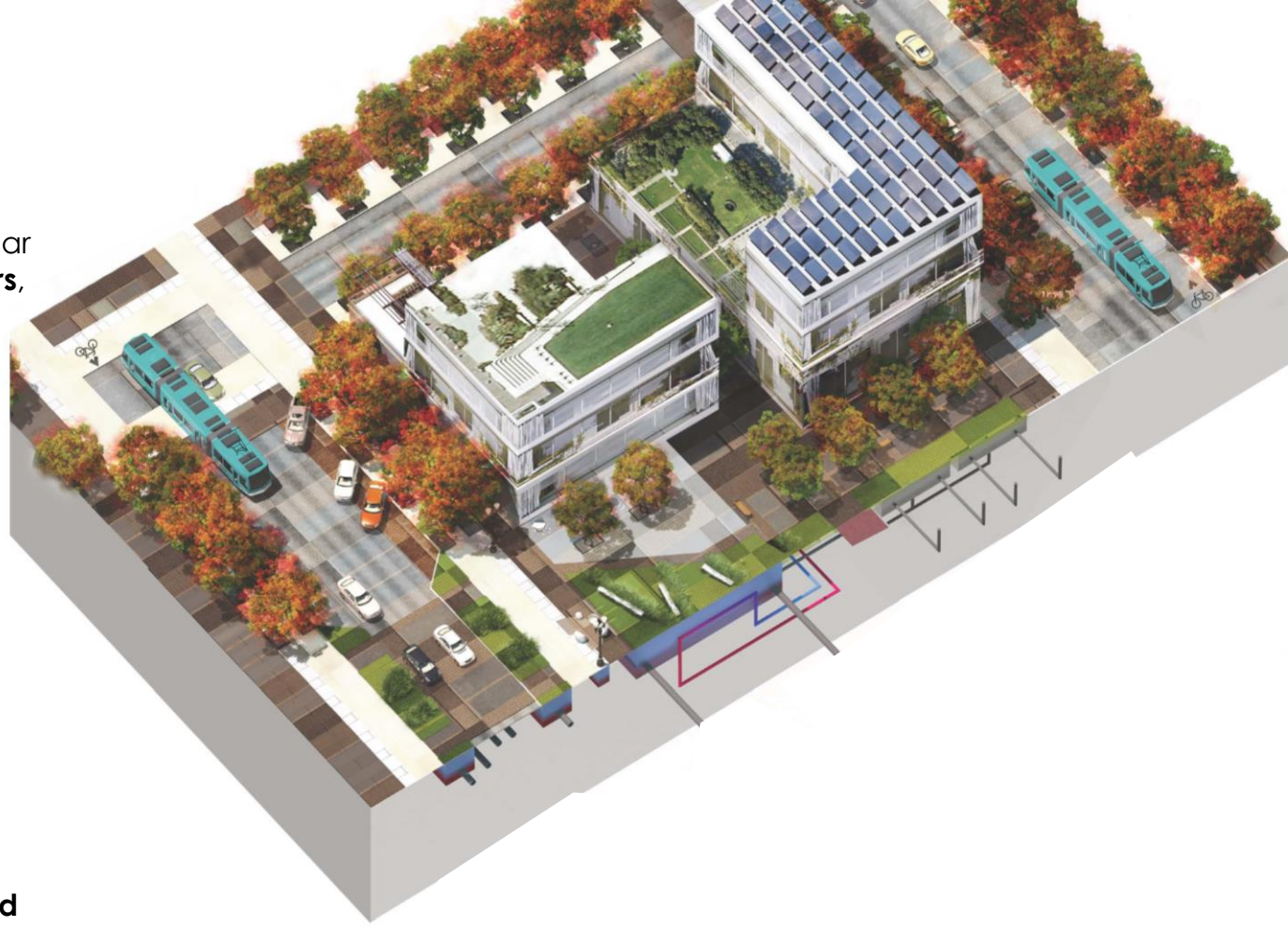
1. Value of policy conformance with available technologies.
 - Adapting policies to new treatment systems.
2. Value of governance
 - Water District inside a Water District.
3. Value of the district scale for resiliency in the provision of water.
 - Investments for disaster that serves ecological values.

ABOVE GROUND STRATEGIES

Building, Sidewalk, Benches, Solar
Street Lights, **Stormwater Planters**,
Family Cycle Track, Rain
Gardens, **Truck, Bus, Car**,
Streetcar, LRT, **Commuter Bike
Lane**, **Commuter Services**,
Thermal Arrays, **PV Arrays**,

BELOW GROUND STRATEGIES

Roof Drain Collection,
Heat Exchange,
Conveyance of Potable Water,
Cleaned Stormwater, **Sewer and
Reclaimed Waste Water**,
Hydronic Thermal Loop,
Micro Energy District,
Elect/DATA.



**SHARED RESOURCES THROUGH
DISTRICT CONNECTIONS FOUND
BELOW AND ABOVE GROUND**

The Right Scale: Thank You