Leveraging Public Spending for Greener Cities

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Are we getting the results we want?
Sustainable infrastructure

- The City of Seattle owns 24 square miles IN the city
Sustainable infrastructure

- We spend much of $650 million each year to maintain and improve it.
The idea: sustainable infrastructure

Manage all public urban lands as an integrated urban ecosystem that
- provides mobility
- open space
- recreation
- habitat
- aesthetic beauty.

Use asset management and triple bottom line accounting to compare alternatives.
What are triple bottom line tools?

Range of feasible alternatives
- Capital-intensive vs. operations and maintenance
- Centralized vs. decentralized
- Department-alone vs. collaboration
- Traditional vs. natural/green
- Supply enhancement vs. demand management
- City staff vs. contracted performance

Alternatives checklist
- Off-ramp: elimination of inferior alternative types and alternatives
Sustainable infrastructure

- We tend to spend that money with a “silo” perspective because of tradition and funding restrictions
Are we missing opportunities for sustainable investments because of we don’t look broadly enough at alternatives?

Can we apply asset management tools to sustainable projects to get more value per dollar spent?

Can we use triple-bottom line accounting?
Test the ideas

- Pilot projects
- Process alternatives
Projects for evaluation

1. Swap polluted stormwater for clean Seattle Center water
2. Compare energy conservation in a district with new demands for shore-to-ship electricity to protect air quality
3. Consider underground voids in historic Seattle for stormwater collection and reuse
4. Evaluate stormwater treatment facilities as a fundamental design element to a new city park
5. Re-imagine mobility strategies for a neighborhood with multi-family growth but no sidewalks
6. Re-purposing water supply reservoir surfaces for urban agriculture or other neighborhood needs
Seattle Center water swap

(to treatment plant)

Denny Way CSO

Seattle Center

Capitol Hill
(stormwater drains to lake)
Seattle Center water swap

13,839,181 liters
Shore to ship + energy conservation

- 2,937 inbound vessels per year to ports of Seattle, Tacoma and Vancouver
- 50,000+ tons per year of CO₂ equivalents released while tied to the dock
- Seattle goal is to reduce greenhouse gas emissions by 680,000 tons
- Port of Seattle and Seattle City Light are exploring use of climate neutral shore power
- Could there be an conservation element linked to new development?
Can we avoid large investment?

- May require expensive substation upgrades
- Redevelopment could shift base load
- Can we avoid costly upgrade with conservation strategy?
Energy conservation

Annual Energy Intensity

- Existing SODO Buildings
- LEED Projects
- International Energy Targets

- Retail
- Office
- Warehouse
- Residential/Hotel
- Other/Unknown
- Seattle Justice Center (Seattle, WA)
- Brewery Blocks (Portland, OR)
- City Operations Center (White Rock, BC)
- US Office Avg for 1990 to 1999 (Bldg EA)
- Western Harbor (Sweden)
- Villa 2000 (Finland)
- Vauban Housing Standard (Germany)
- Automotive Center of Excellence (Australia)

- Steam Consumption
- Gas Consumption
- Elect Consumption
- Energy Targets
Project evaluations

1. Swap polluted stormwater for clean Seattle Center water
2. Compare energy conservation in a district with new demands for shore-to-ship electricity to protect air quality
3. Use underground voids in historic Seattle for stormwater collection and reuse
4. Add stormwater treatment facilities as a fundamental design element to a new city park
5. Re-imagine mobility strategies for a neighborhood with multi-family growth but no sidewalks
6. Re-purposing water supply reservoir surfaces for urban agriculture or other neighborhood needs
Areaways

- Capture runoff from buildings and reuse water
- Could be element of CSO strategy
- Structural issues with ability of areaways to support weight of stored water
Northgate Park n’Ride Park

- Northgate Park N’Ride to become new park
- Ideas from community
- Adjacent stormwater pipes nearby
Linden Av N

- New growth
- Road improvement costs high
- Are there cost effective alternatives?
- Can we leverage city ownership?
Reservoir reuse

- What is long-term function of reservoirs after covering program is completed?
- Evaluate options for green infrastructure, urban agriculture, parks, other
Next steps

- Coordinate capital planning (Silo Buster)
- Conduct deep programmatic review – pick one cross-cutting issue and drill down into it
- Continue pilot projects
- Implement sustainable infrastructure guidelines into budget requests
- Develop long term strategy (10-years plus)
What do we mean “sustainable”?

- Pays for itself over time (the services provided exceed the cost)
- Restores environmental functions (relies upon natural systems/ecologies)
- Benefits the community (provides services, cultural diversity, open space, etc.)
- Benefits the economy (creates jobs, increases opportunity, etc.)
Concepts in sustainable infrastructure

- Multi-media (integrated across resource types or lines of business)
- Full life cycle costs
- Whole city
- Systems thinking
- Public/public – public/private solutions
- “Complete Streets” + 20 feet
- Use existing flows of capital (follow the money)
- Use triple bottom line tools
- Teach and inspire
Seattle Green Factor
Seattle Green Factor

Pre-Settlement Conditions

Historical Urban Development

Urban Greening
Landscapes are more than amenity

- Increase evapo-transpiration due to increase of surface area
- Absorb carbon, release oxygen
- Capture urban dust/ help clean air
- Muffle sound reflectivity
- Provide habitat for birds and bees
- Increase property values
- Cool buildings with shade
- Cool cities – urban heat island affect
- Insulate buildings
- Increase life of roof membrane (green roofs)
- Increase life of building cladding (green walls)
Seattle Green Factor

New requirement in all commercial areas that the equivalent of 30% of the parcel is landscaped

- Allows flexibility
- Encourages landscaping in public areas
- Encourages plant layering
- Encourages vegetated roofs and vegetated walls
- Encourages permeable paving and rain gardens
- Requires maintenance plan