

Considering Green Alternatives

Green Stormwater Infrastructure

Combined
Sewer
Overflow Control

Tiffany McClaskey
KC Engineer II

October 28th, 2010



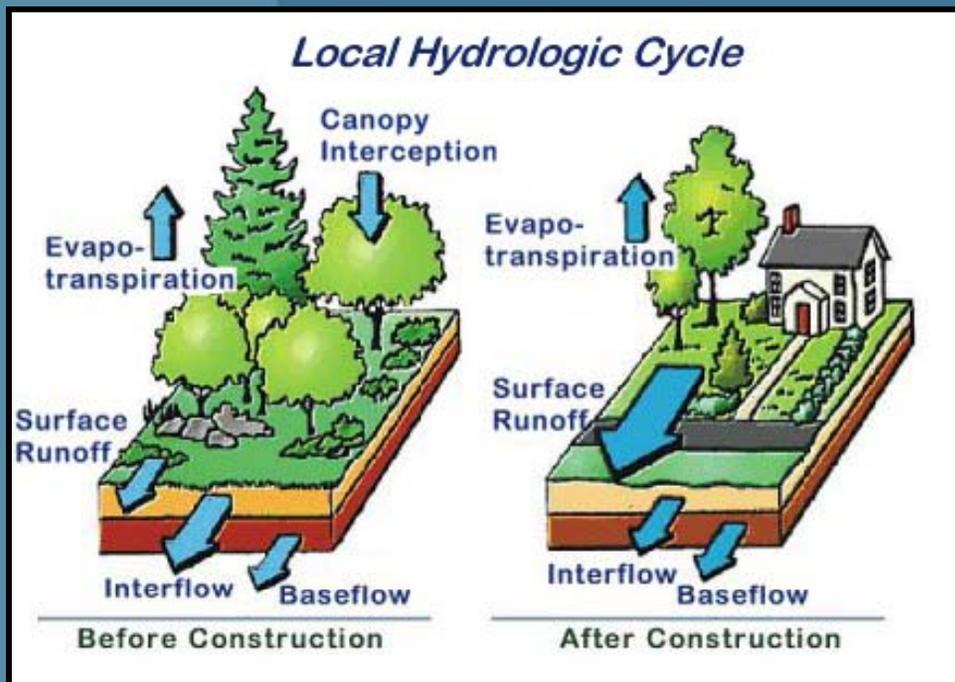
King County

Overview

1. Review of terminology
2. Why a GSI Program
3. KC CSO Program
4. Site Evaluation
5. Case Studies
6. Maintenance
7. Methodology



Terminology



- Low impact development (LID)
- Green [stormwater] infrastructure

- All used to accomplish same goal

Why a GSI Program

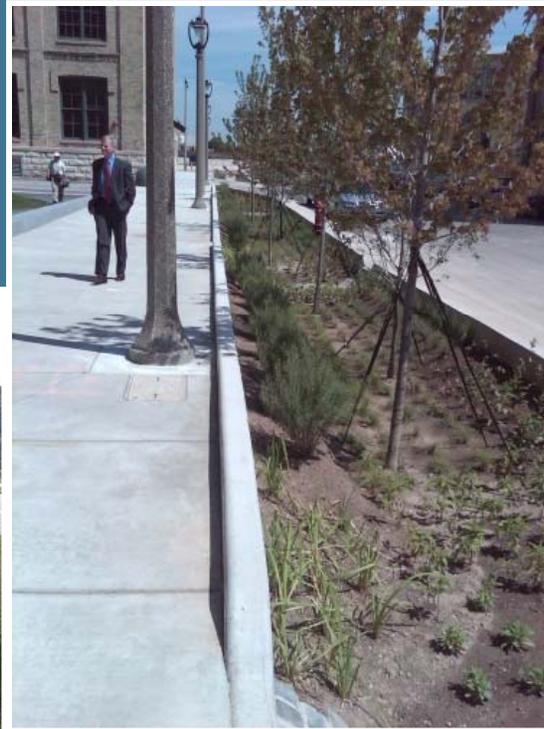
- The EPA now requires green alternative evaluations in long term CSO control plans
- Environmental benefits
- Aesthetics
- Community support

KC CSO Program

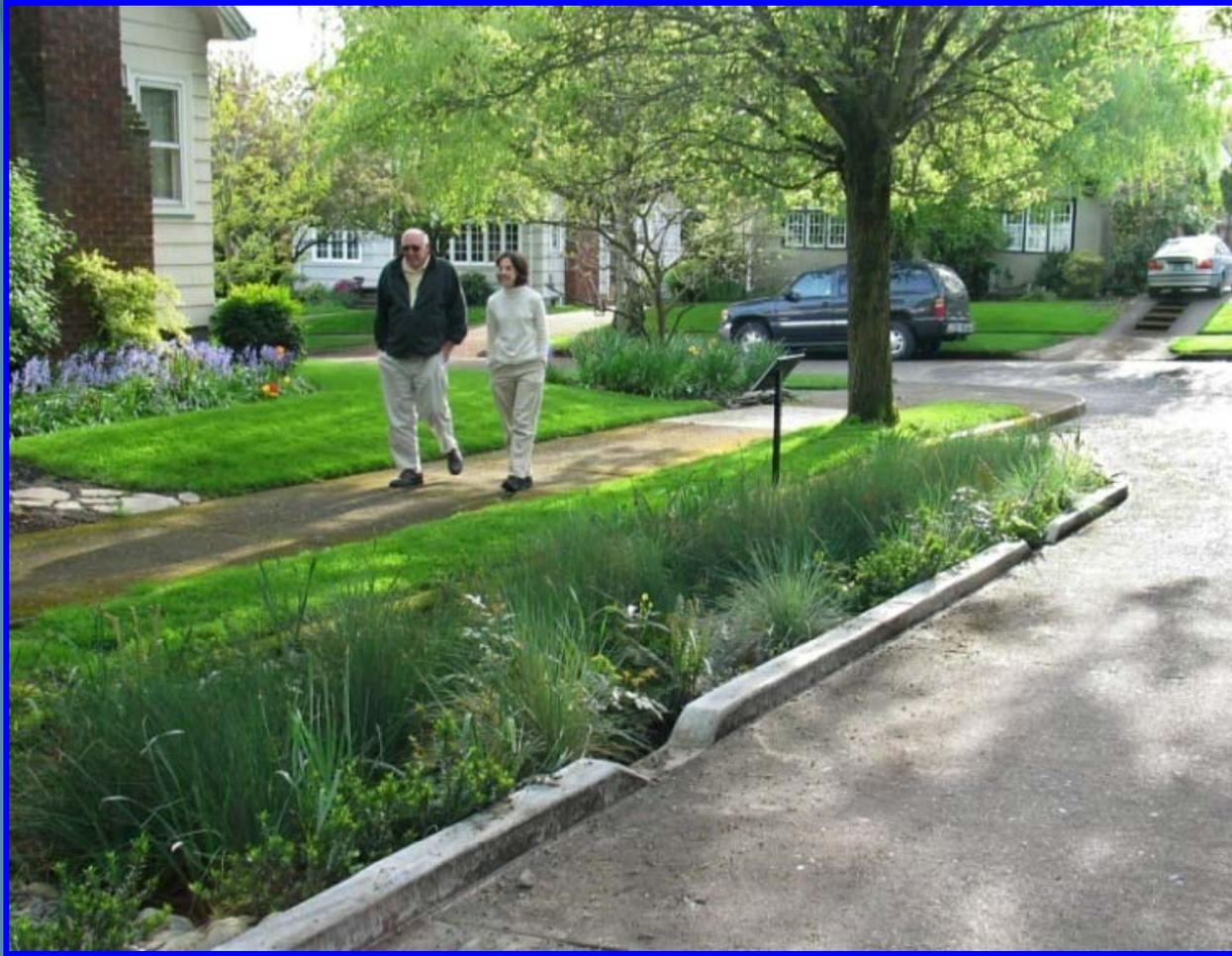
- Evaluate feasibility of green infrastructure
 - Puget Sound Beach Projects
 - Lower Duwamish Waterway
 - Ship Canal
- Continue to research cost effectiveness of grey vs green
- Further develop a green infrastructure program

GSI Is Already Being Used in Various Cities

- Philadelphia
- Kansas City
- Milwaukee
- Portland



Rain Gardens



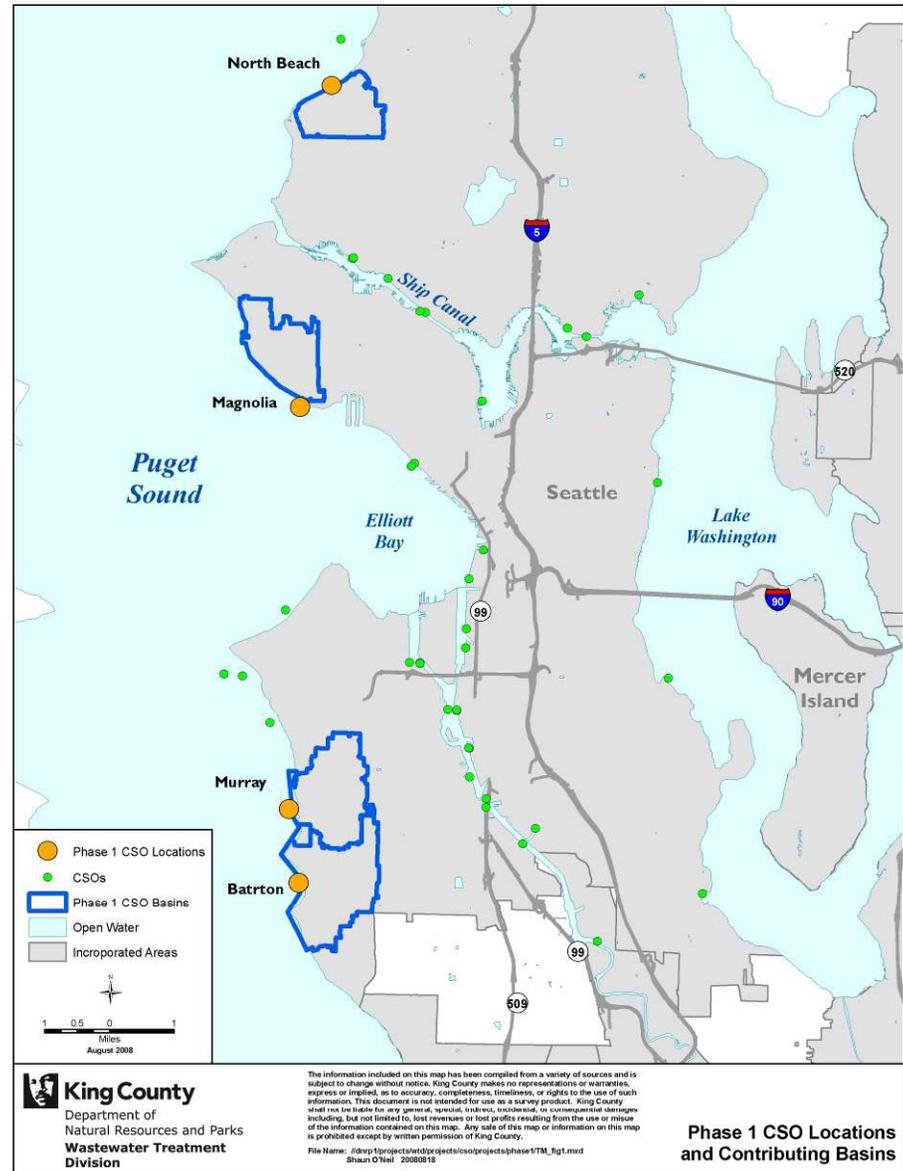
Porous Pavement



Bioswales

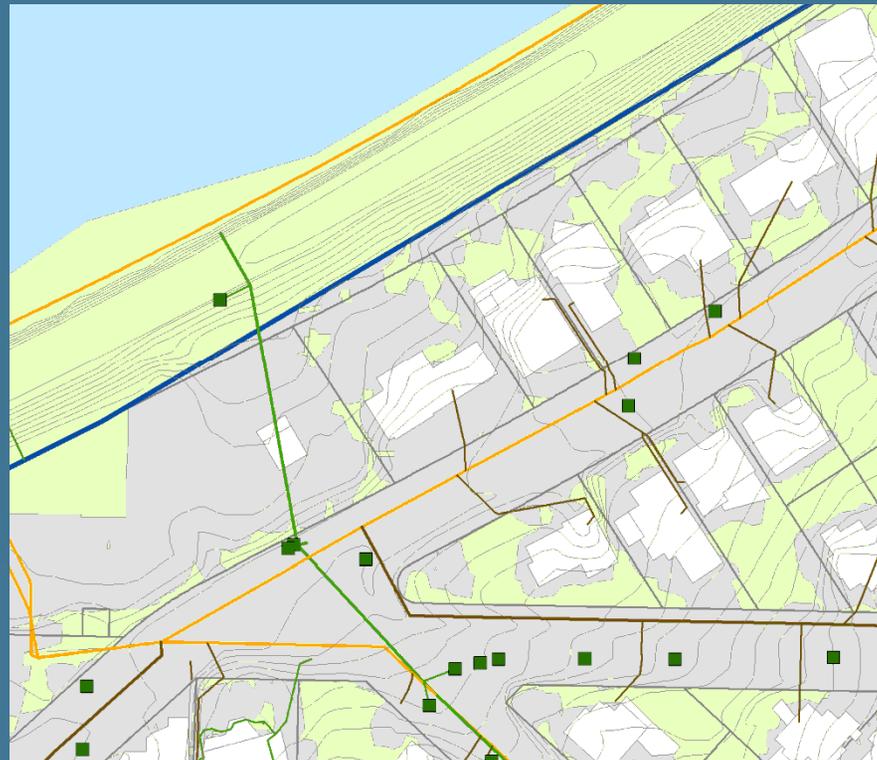


Where
does the
flow come
from and
where is it
going?



Three Destinations

- Combined System (CSS)
- Storm System (MS4)
- Puget Sound



Three Sources

- Roofs
- Impervious Areas
- Pervious Areas

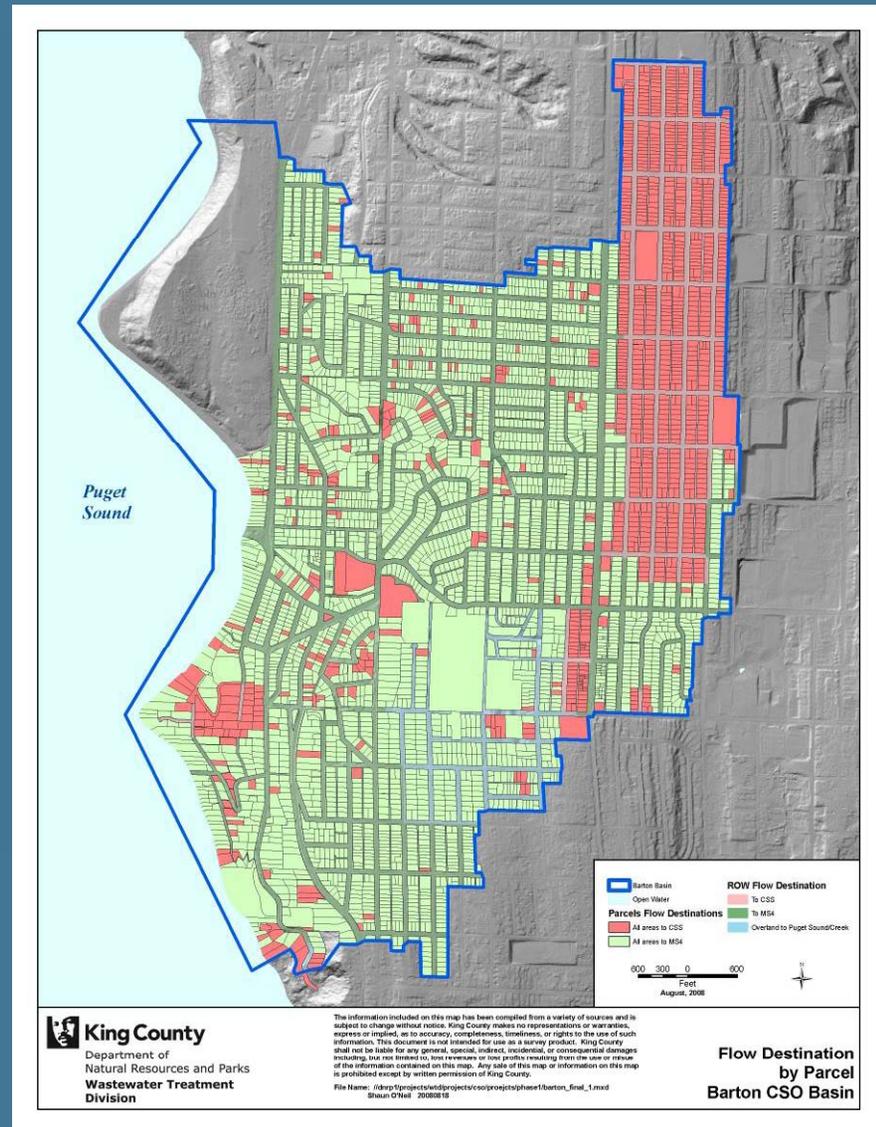


Field Verification



GIS Results

- Maps
- Acreages for each source and destination by sub-basin



GSI Spatial Analysis

- Identify five GSI techniques
 - Ecoroofs
 - Roof Disconnection
 - Street Trees
 - Bioretention
 - Permeable Pavement
- Use a set of criteria to identify suitable locations

ROW Rain Gardens



- Non-rooftop areas in ROW or on private property
- Impervious areas
- Areas connected to the CSS

Results - Barton

	Total acres (impervious /roof)	Ecoroofs		Roof Disconnect		Street Trees		Bioretention		Permeable Pavement	
		A	B	A	B	A	B	A	B	A	B
Barton											
414	234 (135)	0.8	1.2	3.6	7.2	0.1	0.1	0.9	0.4	0.1	0.1
415	115 (38)	1.0	0.8	2.5	2.2	0.0	0.1	1.5	0.8	1.2	0.4
416	314 (217)	5.1	5.4	37.8	48.6	10.0	10.9	40.1	40.1	26.3	26.3
417	200 (100)	1.2	1.6	2.9	18	0.3	0.3	1.4	1.4	2.5	2.9
418	249 (152)	1.2	4.1	5.6	28.2	0.0	0.0	2.8	2.3	2.7	2.7

Next Steps

- Consider GSI in alternatives for Barton
- Model the Basin
- Determine volume controlled by GSI



Questions?

Combined
Sewer
Overflow Control

John Phillips
KC CSO Control Program
Shaun O'Neil
KC GIS



King County