Selecting and Prioritizing Green Infrastructure in Combined Sewer Catchments

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Project Approach

- Overview of 12 case studies
- Compiled spring 2011
- Reviewed summer 2011
- LTCPs approved with GI
- Background
- Methods & strategies
- Application of methods & strategies

City	Service area population	Service area (square miles)	CSS area (square miles)
Cincinnati, OH	855,000	290+	62.6
Cleveland, OH	> 1,000,000	350	81
Detroit, MI	3,000,000 (2008)	1,046	215
Kansas City, MO	653,000	420	58
Louisville, KY	693,000	385	37
Milwaukee, WI	1,100,000	411	24
New York City, NY	8,400,000	337	152
Philadelphia, PA	1,500,000	136	64
Portland, OR	530,000	135	43.8
Seattle, WA	630,000	84	55
King County, WA	1,500,000 (including the city of Seattle)	420 (including the city of Seattle)	55 (including the city of Seattle)
St. Louis, MO	1,400,0000	535	75
Washington, DC	> 500,000 in the District of Columbia plus 1.6 million in the suburbs	725	19.5

Green Infrastructure

- Disconnecting downspouts
- Converting to impervious cover
- Implementing LID
- Retention & detention
- Redirecting stormwater
- Green roofs

Case Study Cities

1. Cincinnati
2. Cleveland
3. Detroit
4. Kansas City
5. Louisville
6. Milwaukee
7. New York City
8. Philadelphia
9. Portland
10. Seattle
11. King County, WA
12. St. Louis
13. Washington, DC

Background

- GI in LTCPs new
- Louisville first submit
- Most driven by cost
- Other benefits later
- Compatible with sustainability goals
- GI at city's risk

Key LTCP Issues

- Proposed level of control
- Implementation schedule
- Ability to meet targets
- Ability to implement

Key GI Challenges

- GI is programmatic
- GI is distributed
- Identification of specific projects problematic
- Performance not well documented
- Implementation requires detailed monitoring
- Institutional constraints

Methods and Strategies

- Programmatic scale
- Watershed scale
- Local scale
- Pilot & demonstration projects
- Modeling

GIS Assessments

- Ownership
- Available space
- Topography
- Utilities
- Trees
- Soil types
- Imperviousness

Methods

- Small scale GIS
- Small scale modeling
- Watershed modeling
- Project identification
- Prioritization
- Plan development

Triple-Bottom Line Evaluation

Institutional Constraints

- Ordinances, codes, & standards
- Inter-governmental cooperation
- Financial issues
- Funding sources

Public Education

- Integral & essential
- Encourages citizen acceptance
- Citizens fee engaged
- Spurs GI on private property
- Increases demand for LID

Three-Step Process

- Basin or CSO prioritization
- GI opportunity assessment
- GI selection

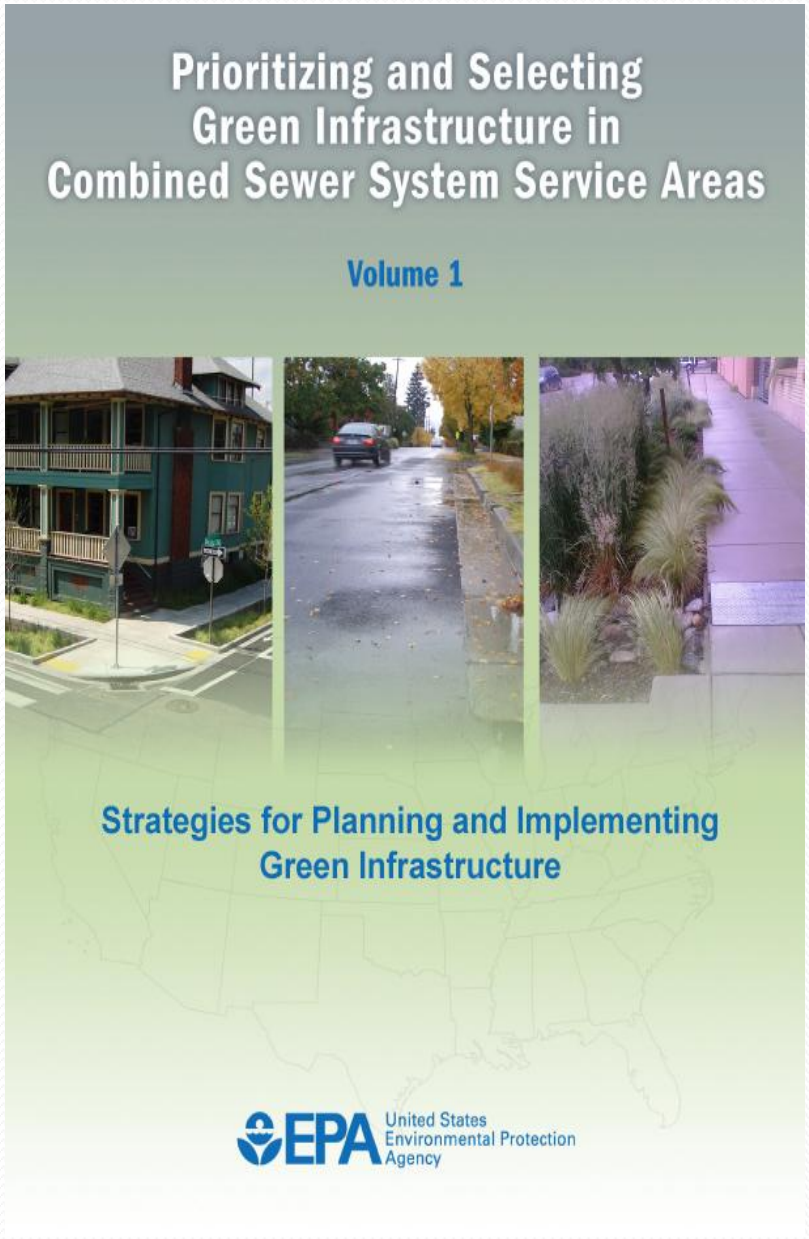
Case Study Summary

City	Lead agency	Agency structure (for CSO planning activities)	Plan financial commitment to GI	Specific location for GI application	Preferred GI approaches
Cincinnati, OH	Cincinnati MSD	Regional authority; operates entirety of combined and sanitary sewer system	Not specified $23 million budgeted 2009 – 2010	Under development; several target areas: Lick Run Watershed Small outfalls	Stream separation, low impact development, regional projects controlling 10 MG or more
Cleveland, OH	Northeast Ohio Regional Sewer District (NEORSD)	Regional authority; operates interceptor system	$44 million, potential to grow to replace gray	Under development; likely focused on areas later in implementation time frame	Larger stormwater practices
Detroit, MI	Detroit Water and Sewer Department	City department	$50 million	Pilot areas in the Rouge River Watershed. Initial focal areas associated with neighborhood stabilization projects	Greening of parcels, downspout disconnection, tree planting, LID practices in rights of way and municipal properties
Kansas City, MO	Kansas City Water Services Department	City department	$28 million GI Pilot Program	Pilot areas identified through cost/benefit analysis include: CSO outfalls 059, 069	Larger stormwater practices, LID practices
Louisville, KY	Louisville MSD	Metropolitan sewer district	$47 million, potential to grow to replace gray	CSOs 130 and 190 based on schedule and size of tributary area	Downspout disconnection, LID practices
Milwaukee, WI	Milwaukee Metropolitan Sewer District	Regional authority; operates interceptor system	not defined	Combined sewer area	LID practices
New York City, NY	New York City Department of Environmental Protection	City department	$2.4 billion (of which $0.9B is from private investment)	The Hutchinson River, Westchester Creek, Flushing Bay, and Jamaica Bay and CSO tributaries watersheds; Newtown Creek; the Bronx River watershed; and the Gowanus Canal watershed	LID practices, larger scale stormwater measures, system optimization, reduced water consumption and separation

Case Study Cities

City	Lead agency	Agency structure (for CSO planning activities)	Plan financial commitment to GI	Specific location for GI application	Preferred GI approaches
Philadelphia, PA	Philadelphia Water Department	City department	$1.67 Billion	GI practices throughout combined area as part of other projects; private incentives. Some focal areas along Delaware River (east of interstate 95)	LID practices; larger stormwater practices; selective separation
Portland, OR	Portland Bureau of Environmental Services	City department	$145 million prior investment $86M - Tabor to the River-Brooklyn Creek Basin Program Future investment not specified	GI practices throughout City as part of other projects; private incentives and redevelopment; target areas include Tabor to the River-Brooklyn Creek Basin Program	LID practices, downspout disconnection
Seattle, WA	Seattle Public Utilities	City Department	not specified	Targeted implementation locations based on specific project study include: Ballard Basin	LID practices in rights of way; private property downspout disconnection
King County, WA	King County Department of Natural Resources and Parks – Wastewater Treatment Division	Regional authority; operates interceptor system	not specified	Targeted implementation locations based on specific project study include: Ballard Basin	LID practices in rights of way private property downspout disconnection
St. Louis, MO	St. Louis Metropolitan Sewer District	Regional authority; operates entirety of combined and sanitary sewer system?	$100 million	Mississippi River tributary areas	Under development
Washington, DC	DC Water	Regional authority; operates combined and sanitary sewer system within DC	$3 million in pilot projects on DC Water sites	Properties owned by DC Water as pilots	Pilot projects, partnerships

Questions?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