Welcome!
Green Infrastructure Curriculum & Training
SIP the Green Juice!

Session 2: Policies, Incentives & Funding
Today’s Speakers

Sheila McKinley  Sarah Hudson  Robin Feller
Three Sessions

1. Overview of Green Infrastructure
2. Policies, Incentives, and Funding for Green Infrastructure
3. Implementation of Green Infrastructure
Overcoming Barriers

1. Technical & Physical Barriers
2. Legal & Regulatory Barriers
3. Community & Institutional Barriers
4. Financial Barriers
1. Technical & Physical Barriers

TRUE OR FALSE...
There is not enough data demonstrating green infrastructure performance.
1. Technical & Physical Barriers

**TRUE OR FALSE**...

There is not enough data demonstrating green infrastructure performance.

http://www.bmpdatabase.org/index.htm
Welcome! The International Stormwater Best Management Practices (BMP) Database project website features a database of over 530 BMP studies, performance analysis results, tools for use in BMP performance studies, monitoring guidance and other study-related publications. New to the site? Start Here

News
- 2014 BMP Database Release
- 2014 BMP Performance Summaries
- 2013 Advanced Analysis
- National Stormwater Quality Database Has A New Home

Related Databases & Research
- National Stormwater Quality Database
- Agricultural BMP Database
- Construction BMP Database
- Chesapeake Bay Research Portal

Urban Stormwater Research Reports
- 2014 BMP Performance Summaries
- 2014 Statistical Appendices
- 2012 Manufactured Device Performance Analysis Summary
- 2012 Volume Reduction in Bioretention
- 2012 Database Overview
- 2012 Chesapeake Bay BMP Performance Summary

Retrieve Urban Stormwater BMP Performance
- BMP Study Retrieval Tool
- BMP Map Tool
- BMP Category Reports
- Online Statistical Analysis Tool
- Download Access Database
<table>
<thead>
<tr>
<th>What Type of User Are You?</th>
<th>Intended Use</th>
<th>Typical Users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low-Intensity</td>
<td>Get Basic Performance Summary Information for BMPs</td>
<td>Public officials, casual users, those seeking quick/fast answers</td>
</tr>
<tr>
<td>Mid-Intensity</td>
<td>Get Detailed Statistical Analysis for Individual BMPs</td>
<td>Consultants, public works staff, designers</td>
</tr>
<tr>
<td>Researcher</td>
<td>Download the Master Database to Conduct Independent Analysis</td>
<td>University researchers</td>
</tr>
<tr>
<td>Data Provider</td>
<td>Obtain Data Entry Spreadsheets</td>
<td>Public agencies, consulting firms, university researchers</td>
</tr>
<tr>
<td>New to BMP Monitoring</td>
<td>Obtain Monitoring Guidance</td>
<td>Public agencies, consulting firms, university researchers, graduate students</td>
</tr>
</tbody>
</table>
BMP Fact Sheet

PLANTER BOXES

Planters boxes receive runoff from multiple impervious surfaces, which is used for irrigation of the vegetation in the planter boxes preventing stormwater from directly draining into nearby sewers. They also play an important role in urban areas by minimizing stormwater runoff, reducing water pollution, and creating a greener and healthier appearance of the built environment by providing space for plants and trees near buildings and along streets. There are three main types of planter boxes which can be used on sidewalks, plazas, rooftop, and other impervious areas: contained, infiltration, and flow-through.

Figure 1: Streetside planter, Portland, OR (city of Portland, Bureau of Environmental Services)

Variations
- Contained
- Infiltration
- Flow-through

Key Design Features
- May be designed as pretreatment
- May be designed to infiltrate
- Captures runoff to drain out in three to four hours after a storm event
- Receives less than 15,000 ft² of impervious area runoff
- Planters should be made of stone, concrete, brick, or pressure-treated wood

Benefits
- Enhances the area where they are placed
- Potential air quality and climate benefits
- Can be used in a wide range of areas, including ultra-urban

Limitations
- Limited stormwater quantity/quality benefits
- Relatively high cost due to structural components

### Potential Applications

<table>
<thead>
<tr>
<th>Potential Applications</th>
<th>Stormwater Quantity Functions</th>
<th>Stormwater Quality Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>Yes</td>
<td>Volume, Groundwater Recharge, Peak Rate</td>
</tr>
<tr>
<td>Commercial</td>
<td>Yes</td>
<td>Low/Med</td>
</tr>
<tr>
<td>Ultra Urban</td>
<td>Yes</td>
<td>Low/Med</td>
</tr>
<tr>
<td>Industrial</td>
<td>Limited</td>
<td>Low/Med</td>
</tr>
<tr>
<td>Retrofit</td>
<td>Yes</td>
<td>TSS, Medium</td>
</tr>
<tr>
<td>Highway/Road</td>
<td>No</td>
<td>TP, Medium</td>
</tr>
<tr>
<td>Recreational</td>
<td>Yes</td>
<td>TN, Low/Med</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Temperature, Low/Med</td>
</tr>
</tbody>
</table>

### Additional Considerations

<table>
<thead>
<tr>
<th>Additional Considerations</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost</td>
<td>High</td>
</tr>
<tr>
<td>Maintenance</td>
<td>Medium</td>
</tr>
<tr>
<td>Winter Performance</td>
<td>Medium</td>
</tr>
</tbody>
</table>
Download the Rain Garden App first. "Rain Garden" is a FREE app designed to help you properly install a rain garden at your home, office, or job site. Through video tutorials, diagrams, text, and tools, the App guides you through determining the size and placement of your garden, selecting plants, digging and planting your garden, and maintaining your garden. It also includes tools for determining your soil type, measuring the size of the area that will drain to your garden, and managing multiple rain garden projects.

Available in 13 states (so far) including Ohio, hopefully soon in Indiana...

http://nemo.uconn.edu/tools/app/raingarden.htm
2. Legal & Regulatory Barriers

TRUE OR FALSE...

Local development codes don’t allow for green infrastructure
2. Legal & Regulatory Barriers

TRUE OR FALSE...

Local development codes don’t allow for green infrastructure.
Review Development Codes

155.44 Design of Streets & Alleys

“Portland cement concrete or permeable pavement shall be of comparable design.”

155.47 Curbs and Gutters

“The Plan Commission shall require curb and gutter to be installed on each side of the street in every subdivision. As an alternate to continuous curb, strategic breaks in the barrier curb shall be provided in order to allow for drainage into stormwater management BMPs.”
Review Development Codes

1. **Street Width**
   
   What is the minimum pavement width allowed for streets in low density residential developments that have less than 500 daily trips (ADT)?
   
   *If your answer is between 18-22 feet, give yourself 4 points*  
   
   At higher densities are parking lanes allowed to also serve as traffic lanes (i.e., queuing streets)?
   
   *If your answer is YES, give yourself 3 points*  
   
   Notes on Street Width (include source documentation such as name of document, section and page #):

2. **Street Length**
   
   Do street standards promote the most efficient street layouts that reduce overall street length?  
   
   *If your answer is YES, give yourself 1 point*  
   
   Notes on Street Length (include source documentation such as name of document, section and page #):

3. **Right-of-Way Width**
   
   What is the minimum right of way (ROW) width for a residential street?  
   
   *If your answer is less than 45 feet, give yourself 3 points*  
   
   Does the code allow utilities to be placed under the paved section of the ROW?

OCRA Green Infrastructure Curriculum & Training
Technical Review Committee
3. Community & Institutional Barriers

TRUE OR FALSE...
Nobody gets it. I’m the only one who understands green infrastructure.
3. Community & Institutional Barriers

TRUE OR FALSE...

Nobody gets it. I’m the only one who understands green infrastructure.
4. Financial Barriers

TRUE OR FALSE...
Green infrastructure is more expensive than grey infrastructure
4. Financial Barriers

TRUE OR FALSE...

Green infrastructure is more expensive than grey infrastructure

http://water.epa.gov/infrastructure/greeninfrastructure/gi_costbenefits.cfm
EPA Case Study Example

- 70 lot residential development
- Using green reduced cost from $2.4 M to $1.6 M
- 56% overall savings in stormwater

<table>
<thead>
<tr>
<th>ITEM</th>
<th>COST SAVINGS (Green vs Grey)</th>
<th>PERCENT SAVINGS (Green vs Grey)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Preparation</td>
<td>$166,000</td>
<td>24%</td>
</tr>
<tr>
<td>Stormwater Management</td>
<td>$422,779</td>
<td>64%</td>
</tr>
<tr>
<td>Site Paving &amp; Sidewalks</td>
<td>$187,617</td>
<td>24%</td>
</tr>
<tr>
<td>Landscaping</td>
<td>-$15,000</td>
<td>-7%</td>
</tr>
</tbody>
</table>
Indiana Case Studies

• 12 selected case studies for this training
• Examples for CSO, street flooding, localized flooding, and sustainable site design
• Cost savings using green infrastructure
What are the options to fund green infrastructure projects?
Your Project

- OCRA
- SRF
- Stormwater Utility/Local Funds
- Public Private Partnership
- Grants
- Borrowing
- Incentives
- Rural Development

OCRA Green Infrastructure Curriculum & Training
Program List

- Stormwater Improvements Program (SIP)
- Wastewater and Drinking Water Program (WDW)
- Public Facilities Program (PFP)
- Main Street Revitalization Program (MSRP)
- Downtown Enhancement Grant (DEG)
- Place Based Investment Fund (PBIF)
- (Disaster Recovery Appropriation 2 (DR2))
Case Study: West Elementary School Drainage Improvements Project

• Located in Mount Vernon, IN
• Owned by City of Mount Vernon
• Construction completed December 2012
West Elementary School - Description

- Flooding at school and surrounding neighborhood
- Safety hazard for children walking to school
- Negative impacts to homeowners
- Shallow pipes caused limitations
- Basins caused liability concerns
West Elementary School - Solution

• Bioretention areas and berms
• $524,287 OCRA grant from the Stormwater Improvements Program ("SIP")
• Local Match from the City Sewer Fund and Mount Vernon School Corporation
West Elementary School-Benefits

• Safe Routes to School
• Solved flooding problems
• Most cost-effective
• Only viable option
Indiana State Revolving Fund (SRF) Loan Program

• Green Project Reserve Sustainability Incentive
• Higher ranking on Project Priority List
• Interest rate break up to 0.5% (applied to entire loan amount) or cost of “green” component
Case Study: Washington (CSO) Wetland System Project

- Located in Washington, IN
- Owned by City of Washington
- Construction completed July 2012
CSO Wetland System - Description

- City operated a combined sewer and stormwater system
- “Grey” cost to fix separate >$50 Million
- City’s main waterway that received CSO discharge supported no aquatic life
Washington CSO Wetland System

• “Grey” infrastructure to separate systems and store CSO effluent
• “Green” infrastructure (27 acre constructed wetland) to treat and store effluent from large rain events
# Washington CSO Wetland System

Table 1. Green Infrastructure Benefits- Cost Comparison

<table>
<thead>
<tr>
<th>Description</th>
<th>Capital Cost</th>
<th>Annual O&amp;M</th>
<th>Total Present Worth Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grey Only Solution</td>
<td>$52.8</td>
<td>$1.6</td>
<td>$80.0</td>
</tr>
<tr>
<td>Grey and Green Solution (includes Constructed Wetland)</td>
<td>$25.9</td>
<td>$0.03</td>
<td>$26.2</td>
</tr>
<tr>
<td><em>Wetland Construction Only</em></td>
<td>$3.9 M</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Washington CSO Wetland System

- Reduced CSO discharges
- Above average effluent
- Aquatic life has returned to Hawkins Creek
- Less energy and chemicals
- Cost effective solution
Washington CSO Wetland System

Funded by:

• $9 M grant from OCRA DR2
• $16.9 M loan from Indiana State Revolving Fund Loan Program (2.81% interest rate)
• $1 M savings from 0.5% interest rate break
Local Funds

- Stormwater Utility fees
- Wastewater Utility fees
- Transportation funds
- General Revenue
- Taxes: COIT, CAGIT, CEDIT, TIF
Stormwater Utility Formation

- Develop feasibility and rate study
- Create a billing system, policy and procedures
- Stakeholder engagement
- Adopt ordinances
- Implementation and public outreach
Case Study: North Street Reconstruction

• Located in Lafayette, IN
• Owned by City of Lafayette
• Construction completed October 2013
North Street Reconstruction - Description

- City operated a combined sewer and stormwater system
- City needed to reduce stormwater
- Deteriorated roads in historic downtown not ADA compliant
North Street Reconstruction - Solution

- Porous pavers
- Rain gardens
- Reused historic brick
- Project cost $1.68 M and was paid from city transportation and stormwater funds
North Street Reconstruction-Benefits

- Removal of ~6.6 MG from combined sewer
- Eliminates $44,000 in WW treatment costs
- Street reconstructed
- Neighborhood revitalization
- Meets ADA accessibility needs
Case Study: Mackey Athletic Facility

- Located in West Lafayette, IN
- Owned by Purdue University
- Construction completed March 2009
Mackey Athletic Facility - Description

• Large parking lot generated a significant volume of stormwater, which went to traditional stormwater system
• Area was subject to frequent, localized flooding
Mackey Athletic Facility- Solution

• Bioswales throughout the parking lots
• Large stone infiltration beds below practice fields
• During very high flow events, the infiltration beds discharge back to stormwater system
• Project cost $1.78 M and was paid for by the university
Mackey Athletic Facility- Benefits

- Reduces campus flooding
- Meets parking needs
- Promotes campus greening
- Eliminates the need and cost to construct a large expensive detention basin
Green Infrastructure Incentives

- Homeowners
- Rate payers
- Developers
Case Study: “Catching Rain Fort Wayne”

- Fort Wayne City Utilities
- Residential Rain Garden Incentive Program
- Application, workshop, agreement, register
- Cash incentive $2.00 per sq. ft. of rain garden installed, up to $250.00 (125 sq. ft.)
Case Study: “Catching Rain Fort Wayne”

http://www.catchingrainfw.org/
Incentive Program

Fort Wayne City Utilities has developed a program to help you build and maintain a rain garden at home. A direct cash payment is available to help you with some of the costs of plants or other rain garden needs. Incentives are only available to residential properties inside the City of Fort Wayne.

There are four general requirements for the incentive program. Home owners must:

1. Complete an Application and submit it to the City
2. Attend a free instructional workshop-- click here for dates. Following the workshops, technical assistance will be provided by City staff members and the Allen County Master Gardeners if requested.
3. Sign an Agreement to install and maintain a rain garden -- these will be available at the workshops and may be signed then. Plant match certificates will be given at the workshop. Cash payments will be mailed following the workshops.
4. Register the garden
4206 Arlington Avenue
4206 Arlington Avenue
46807 - Fort Wayne

Partial Sun

Chuck had originally planned a rain garden of about 315 sq ft, but is expanding it to just over 460. He is directing water from all 5 downspouts into rain gardens and other gardens around the property and plans to eliminate all turf grass. Chuck's property drains extremely well with a 12 inch column of water soaking into the ground in 15 minutes. He has tilled the topsoil into 14 inches of sandy loam and simply raked the loose grass away. He plans to plant hostas and ornamental grasses in the front of his property.
134 square foot garden with full sun exposure. Located in the SW corner of backyard 10.5 feet from the downspout feeding it.
Kidney shaped garden with 215 square feet. Receives water from 3 down spouts. Full sun exposure. Garden contains 7 Blue Flag Iris, 14 Crested Sedge, 11 Fox Sedge, 38 Wild Bergamont, 38 Swamp Rose Mallow, 4 spirea bushes, and 2 Forsythia bushes.
Case Study: Stormwater User Fee Credits

- City of Seymour, IN
- Stormwater Utility Policy and Procedures Manual
- Adopted February 2014
Stormwater User Fee Credits

- Low-Impact Development Credit
- Education Credit
- Open Space Credit
- Conservation Area Credit
- Over-Detention Credit
- One-Time Credit
Case Study: Expedited Permit Reviews

- City of Indianapolis, IN
- Developers who are applying for permits for projects that contain green infrastructure components are afforded an expedited permit review
Incorporating Green Infrastructure into your SIP Application
SIP Overview

- Applicant Eligibility
- Program/Project Eligibility
- Funding Overview
- Application Process
SIP Application

- Incorporated towns, small cities, and counties that are Non Entitlement areas
SIP Application

- Meet National objective of the federal Community Development Block Grant Program
  - Benefit low to moderate income persons (at least 51% of beneficiaries)

- Be an eligible activity
  - Specifically, must include storm drainage infrastructure improvements only

Program/Project Eligibility
SIP Application

- Generally, $2 million available each year
- Maximum award is $500,000
- 2015 awarded ~$3.5 million or 7 grants at ~$500,000
- Required Local Match of 10%
SIP Application

• One competitive round per year
• Process:
  1. Proposal
  2. Site visit with OCRA liaison
  3. Final application
OCRA SIP
Green Incentives

Today

April 2016 Consolidated Plan issued

July 2016 Changes to SIP go into effect (e.g. addition of specific green incentives)
Tips from Successful Grant Administrators

• Meet deadlines
• Coordinate with OCRA Liaison
• Don’t assume – ask questions
• Tell your story in a thorough and clear way
• Describe all your efforts
• Understand and maximize points
SIP Application

Current Grant Evaluation Criteria (750 points)

- National Objective Score: 40%
- Community Distress Factors: 23%
- Local Match Contribution: 13%
- Project Description Factors: 10%
- Project Sustainability: 7%
- Points Reduction Policy: 7%
SIP Application

Current Project Description Factors (300 Points Total)

- National Objective Score: 40%
- Community Distress Factors: 23%
- Local Match Contribution: 13%
- Project Sustainability: 10%
- Points Reduction Policy: 7%
- Project Description Narrative: 7%
- Project Need Narrative: 6%
- Financial Impact Narrative: 17%
- OCRA Green Infrastructure Curriculum & Training
SIP Application

*Current* Project Description Narrative (50 Points)

- Describe the proposed green infrastructure project
- Previous Planning Efforts
  - Rate study
  - Stormwater utility, instituting a stormwater fee
  - Revised existing manual to give green infrastructure credits/expedited permit review
SIP Application

Current Project Need Narrative (125 Points)

- Describe the problem
- Pictures
- Letters of support from residents, agencies, and organizations
- Violation letters or enforcement actions
SIP Application

*Current* Financial Impact Narrative (125 Points)

- Financial options investigated
- Local match package
- Previous efforts (including funds and man hours)
- “Explain the sustainability and maintenance for the project”
SIP Application

*Current* Project Sustainability (50 points)

Establishment of, or documentation of, existing sustainability plan for the ongoing O&M of the stormwater utility

- 0 points - under $3 monthly stormwater utility user rate
- 25 points - $3-$5 monthly stormwater utility user rate
- 50 points - $5 or higher monthly stormwater utility user rate
Call To Action

• Allow Green Infrastructure
• Promote Green Infrastructure
• Implement Green Infrastructure