SEMCOG Green Infrastructure Activities

- Regional Green Infrastructure Vision
- GLRI Green Streets
- MDOT Grants
- EPA Technical Assistance
Green Infrastructure Vision for Southeast Michigan

• Benchmark
• Stakeholder Visioning
• Recommendations
GI Vision: Benchmark What We Have
### Southeast Michigan Land Cover

<table>
<thead>
<tr>
<th>Leaf On</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impervious</td>
<td>14%</td>
</tr>
<tr>
<td>Tree</td>
<td>33%</td>
</tr>
<tr>
<td>Open</td>
<td>49%</td>
</tr>
<tr>
<td>Bare</td>
<td>1%</td>
</tr>
<tr>
<td>Water</td>
<td>3%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>
GI Vision: Where We Want To Go

Recommendations...
Visioning & Pulse of the Region Survey: Green Infrastructure Priorities

1) Most Important GI Benefits
   - Improve Water Quality
   - Economic Benefits
   - Improved Aesthetics
2) Most Important GI Elements
- Natural Areas
- Bike/Hike Trails
- Trees & Rain Gardens along Roads, Downtowns & Parking Lots
Visioning & Pulse of the Region
Survey: Green Infrastructure
Priorities

3) Top Places for More GI
   - Along Rivers & Lakes
   - Near Parks
   - Along Major Roadways
   - Vacant Property

Source: FTC&H
Priority Areas: Roads

- SEMCOG Region Impervious Cover
  - 35% Roads
  - 25% Buildings
  - 40% Other
    » Parking Lots
    » Driveways

Source: City of Chicago
Green Streets & Multiple Outcomes

- Watershed Goals
  - Runoff Reduction
- Water Quality
- Air Quality

Source: City of Chicago
Green Streets & Multiple Outcomes

- Transportation & Infrastructure Goals
  - 5-Year TIP
  - Regional Long Range Trans Plan
  - Capital Improvement Plans
  - Pedestrian-Friendly
  - Traffic Calming

Source: City of Chicago
Green Streets & Multiple Outcomes

- Community Goals
- Streetscapes
- Connect Neighborhoods, Parks

Source: City of Chicago
Local & Regional Planning Efforts

- Incorporate into multiple community plans
- Conceptual Planning Stage
- Transportation Alternatives Program

Source: HRC
EPA Technical Assistance

- Runoff Reduction Targets
- Biological Basis
- 3 Subareas in Region
- Template for Replicating

Partners: MDEQ; MDNR; MDOT; DWSD
MDOT Transportation & Watershed Planning

- Watershed Approach
- 5-Year Transportation Plan
- Rouge Watershed
MDOT: I-75 Corridor Regional Ecosystem Framework

- Ecological conceptual planning for 20-year reconstruct
- MNFI & SEMCOG partners
- Wetland mitigation and stormwater management opportunities (what and where)
- Online GIS tool
  Template for ecological planning with long-range transportation planning
City of Ann Arbor Green Streets Policy

- Environmental Commission
- Public Streets
- Infiltration Standard
- Collaboration w/ City Staff
City of Ann Arbor Green Streets Policy

- Rules of Washtenaw County Water Resources Commissioner
- LID Manual
Public Street ROW in City of Ann Arbor

- Public 3 sq. mi.
- 10% of City area
- 26% of City impervious area
Site Conditions

Within the floodplain

Slope > 20%

Infiltration rate < 0.6 in/hr

Infiltration rate 0.6 in/hr - 2.0 in/hr

Infiltration rate > 2.0 in/hr

Yes

Yes

Yes

Yes

No

No

No

No

First 1 inch

50% annual chance 24 hr event (2.35"")

10% annual chance 24 hr event (3.26"")

Yes

Yes

Yes

Yes

No

No

No

No
Green Streets GLRI Grant

- **Wayne County**: Grow Zones within ROW
- **Oakland County Campus**
- **Macomb County** Metropolitan parkway grow zone
- **Monroe County & City of Luna Pier – Luna Pier Blvd**
- **Great Lakes Green Streets Guidebook**

Source: Robert W. Domm
Great Lakes Green Streets Guidebook

- Why Green Streets
- Local & Regional Planning Considerations
- Technical Challenges
- Funding Challenges
- Types of GI Techniques
- Case Studies – Great Lakes Watershed

Source: Village of Pinckney
Bioretention or Bioswale: Local Road
Michigan Avenue, Lansing, MI

The Michigan Avenue Streetscape Bioretention Facilities project consists of landscape planters and sidewalk paving improvements including new concrete sidewalks and acorn tree planters, ornamental fences, rain garden planters, and site furnishings. In addition, a series of bioretention facilities were designed as part of a Michigan Avenue corridor enhancement project. Bioretention was developed in conjunction with the city's controlled sewer overflow work as a means to control, clean, and disperse stormwater in an urban environment. The rain garden is designed to remove sediment, nutrients, heavy metals, and other pollutants, as well as reduce water temperature, promote infiltration, evaporation, and transpiration of the stormwater runoff, thereby reducing the overall impact to the Grand River.

(Above) Michigan Avenue bioretention and (right) curbside to bioretention.

Project benefits
Water quality • Runoff reduction • Community aesthetics • Traffic calming
Pedestrian safety • Community education through interpretive signage

Project challenges
High material costs (decorative fence, retaining wall & metal plates were significant cost increase) • High maintenance needs due to litter

Post-construction monitoring
75% average annual runoff volume reduction • 55% to 85% reduction of peak flow rates

Lessons learned
In this urban setting, litter comes from wind-blown trash, washes down the gutter pan, and is thrown directly into the rain gardens. It consists of cigarette butts, cups, fast food wrappers, pet waste, bottles, etc. While the bioretention areas keep the litter out of the river, a high level of regular maintenance is necessary to keep the rain gardens visually appealing. Design alternatives could include trash basket collection systems along with sediment traps. Additional maintenance would be required to empty the trash collection basket, however the trash would be concentrated to key locations. Maintenance challenges with litter of this type and quantity are common with bioretention systems in ultra-urban settings.

Project sponsor
City of Lansing

Project designer
TerraTech, C2AE, Wildtype Design, Native Plants & Seed, Ltd.

Project contractor
Aggregate Industries/Eastland Concrete, Inc.

Construction costs
$2,593,000 total costs
$1,000,000 green infrastructure costs

Key design features
- Ultra-urban application
- Extends over 4 city blocks
- 30 planter box bioretention gardens
- Designed for approximately 1-inch of runoff
- 4.1 acre tributary area
- Adaptable design to meet community needs

Contact information
Dan Christian, PE
Dan.Christian@tetratech.com
Case Study: Michigan Avenue, Lansing Bioretention

- Ultra-urban application
- 4 city blocks
- 30 planter box bioretention gardens
- 1-inch of runoff
- 4 acre tributary area
- CSO reduction
- Traffic calming
- Pedestrian Friendly
Case Study: Maywood Avenue, Toledo Bioswales

- Work towards CSO reduction
- Reduced street flooding & basement backups
- Low maintenance with turf design
- >60% runoff reduction
- 60-70% peak flow reduction

Source: Dan Christian
Case Study: Wayne County Grow Zones

- 47-acres of grow zones in Wayne County
- Water quality & habitat improvements
- Ecorse Boulevard
- Morton Taylor Road

Source: Wayne County
Case Study: Macomb County

- Grow Zone
- Metropolitan Parkway
- Tributary to Lake St. Clair

Source: Macomb County
Case Study: Luna Pier Blvd, Luna Pier Bioretention

- Volume reduction
- Streetscape enhancements
- Community development
Case Study: Oakland County

- Grow Zones
- Oakland County Planning & Economic Development Services
- Oakland County Facilities Management
- 27,000 lbs sediment

Source: Oakland County
THANK YOU!

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GLRI Green Streets Grant

“Restoring the Lake Erie Corridor through Green Streets”
1) Background & Project Design
Jim Keglovitz, Planner

3) Project Reality
Phil Goulding, Grounds Division Chief
Southeast Michigan
20 miles northwest of Detroit

Consists of 910 square miles

Population of 1.2 million

More than 1,400 lakes

Headwaters of five major rivers

Nearly 96 miles of regional trails

And 60,000 acres of parkland
Background

Oakland County’s
Green Infrastructure Vision
Completed in 2009
County Campus Opportunity:
• 260 acres actively managed
• 100 acres irrigated
• 5 miles of road

County Campus Issues:
• Ponding Water - Heavy Clay Soil With Almost no Soil Absorption
• Road Runoff
• Large unused mowed areas
Native Revegetation

Native revegetation includes the restoration of forest cover (natural forest among prairie plants), and/or prairie. Revegetation is done primarily on native vegetation due to the numerous benefits, which include: reduced maintenance needs.
North Focus Area

- Ponding Water/Flooding
- Large unused mowed areas
- Road Runoff
- High visibility
  (Over 27,000 vehicles a day)

South Focus Area
Identified:

- 15 individual native plant grow zones areas...
- About 16 acres...
- Areas that receive a majority of the county campus roadway runoff...
Planting Plans

- Wildflower & Grass Seed
- Wildflower Plugs
- Trees (white Cedar & Tamarack)
- Shrubs

Drainage Area Calculations
When choosing our vendors, we wanted to:

1 - Use plants that are truly native to the area

2 - Support our local businesses

3 - Work with and learn from experts in the field
Soil consideration
Poor/wet/dry

Bids
Native Plant Availability

Weather
Unpredictable

Maintenance
Ongoing
Soil consideration
Weather
Maintenance
Treated Grass Ready for seed
No Till Seeder
White Cedar & Tamarack Plantings
Project Pictures
Thank You

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Phil Goulding, Grounds Division Chief
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