Integrating Green Infrastructure into the DWSD CSO Program
We know the problems
The past is the past...
It’s time to move on.
Our shared outcomes

Access to Jobs, Markets, Services, and Amenities

Reliable, Quality Infrastructure

Economic Prosperity

Desirable Communities

Fiscally Sustainable Public Services

Healthy Attractive Environmental Assets

Green Infrastructure
Who has a role in Green Infrastructure?

Who Doesn’t!
Project Redesign

- Original tunnel terminated
- Met EPA financial hardship criteria
- New project includes grey & green infrastructure
- Green infrastructure expected to be incorporated as a regulatory requirement in the new NPDES permit
**DWSD’s Financial Commitment**

- $50 M over 20 years
- Operating expense, not capitalized
- $3 M per year operating expense is roughly equivalent to $50 M investment in conventional CSO control facilities
Project Area

- West side of Detroit
- Over 107,000 Parcels
- 24,000 Acres
- 37.5 Square Miles
- Three freeway systems
- Rouge Park and Eliza Howell Park
Green Infrastructure Analysis Outcomes

• **Estimate Benefits**
  - Stormwater runoff volume
  - Air quality
  - Economic value
  - Urban temperatures
  - Energy efficiency
CITYgreen© Green Infrastructure Analysis

- Land cover analysis not GI BMP analysis
- Focus on stormwater runoff volume
- Utilize changes in land cover to estimate volume reduction
CITYgreen© Green Infrastructure Analysis

- Stormwater runoff analysis
  - TR-55 Curve Number Method
  - Analysis of existing vs. future scenario
  - 2-year; 24-hour event
city of Detroit rainfall data (2.25 inches)
  - Local topography
  - Hydrologic soil group
Data Sources

- City of Detroit Parcel Data
- Estimated Abandoned Lots – City Data
- 2005 Land Cover
- Land Cover Classifications
  - Tree Canopy
  - Open Space
  - Urban
  - Water
  - Bare
Land Cover

- 44% Impervious surface (roads largest source)
- Residential is largest contributing area
- Good tree canopy in many areas
City of Detroit Parcel Data

- City of Detroit Properties
  - Parks
  - Municipal Buildings
  - Vacant Tax Exempt
- Commercial
- Industrial
- Residential
- Institutional

- Roads
- Schools
- State Land
- Wayne County Land
- Vacant Non-Tax Exempt
- Other (Fed, Hospital, Civic)
# Parcel + Land Cover Data Results

<table>
<thead>
<tr>
<th>Parcel Type</th>
<th>Total Area (Acres)</th>
<th>Impervious (Acres)</th>
<th>Open Space-Grass Scattered Trees (Acres)</th>
<th>Trees (Acres)</th>
<th>Urban-Bare (Acres)</th>
<th>Water (Acres)</th>
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<tbody>
<tr>
<td>City of Detroit Parks</td>
<td>2,032</td>
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<td>938.5</td>
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CITYgreen© GI Analysis

- Parcel/land cover combination
- Future scenarios by percent change
- Model results - existing vs. future scenario
- Results based on CN reduction and stormwater runoff volume reduction for 2-year; 24-hour event (2.25 in)
- Air Pollution (CO, NO₂, O₃, PM10, SO₂) Reduction
- Carbon Benefits
- Carbon Sequestration (rate carbon removed)
Example - Roads

• **Existing**
  - 3,407 Acres Impervious
  - 853 Acres Open Space- Grass/Scattered Trees
  - 2,426 Acres Tree Canopy: Grass/Turf Understory
  - 57 Acres Urban: Bare

• **Future Scenario**
  - Convert 33% of Impervious Area to Tree Canopy w/ Impervious Understory
  - Convert 50% of Open Space Grass to Tree Canopy w/ Grass Understory
Roads Analysis Results

- **Stormwater Runoff Volume**
  - Approximately 7.5 million CF reduction
  - Curve number change from 89 to 84

- **Air Pollution**
  - 308,000 lbs/year removed

- **Carbon Storage**
  - 171,000 tons

- **Carbon Sequestered**
  - 1332 tons/yr
Other Scenarios

• Residential: Disconnect Downspouts

• Parks: Increase tree canopy and grow zones

• Municipal properties: Manage parking lot runoff
Overall Analysis Results

- Approximately 22% reduction (180 MG)
- 2-year; 24-hour event (2.25 inches)
Green Infrastructure Activities

- Tree Planting
- Demolitions and Greening Vacant Properties
- Greening Roadways
- Municipal Properties
- Downspout Disconnection
Implementation Strategy

- Reduce inflow to combined sewers 10% - 20%
  - Goals include volume reduction, as well as quality of life issues.
- Acknowledges demographic and population changes
- Works towards City goals of removing abandoned homes and dealing with urban blight
- Coordinating with Detroit Works efforts
- Utilizing various departments expertise and established processes, including partnering w/ Greening of Detroit
- Reflects national Green Infrastructure strategies
- Consistent with CSO approaches across country (Philadelphia, Portland, Cincinnati, Washington D.C.)
Collaboration is Key
Implementation Strategy

• **Early Focus:** Two pilot areas focusing on techniques consistent with stabilization efforts.

• **Evolving Focus:** In coordination with Detroit Works, implement larger-scale greening efforts.
Implementation Strategy

- **Pilot Areas**
  - Focus on stabilization green techniques
  - Support Detroit efforts
  - In concert with NSP 3 stabilization areas

- Rosedale Park
- Rouge/Cody
Rosedale Park

- Grandmont/Rosedale Development Corporation
- GI Techniques
  - Street trees, pilot stormwater forest, downspout disconnection, small number demolitions/greening vacant
Rouge Cody

- Joy-Southfield Community Development Corporation
- Rouge Park
- Support Cody High School/Stein Playfield reinvestment
- GI Techniques
  - Street trees, road retrofit, road reconstruction, downspout disconnection, demolitions/ greenling vacant
Tree Planting

• **Short Term**
  – Focus on Pilot Areas
  – Street Trees
  – Pilot Stormwater Forests

• **FY 2010/2011:** 1000 trees
• **FY 2011/2012:** 2000 trees
Tree Planting

- **Long Term**
  - Forested Lots
  - Stormwater Forests in under utilized parks
Demolition and Greening
Vacant Parcels

• Demolition Short-Term
  – City-Owned Residential Units
  – Private-Owned in Pilot Areas
  – Setting up for larger greening opportunities

• FY 2010/2011: 6-7 City Owned

• FY 2011/2012: 165 Private
Demolition and Greening Vacant Parcels

- **Greening Short-Term**
  - Determining techniques
  - Pilot Greening individual lots
  - Discussions on multiple lot greening
• Long Term
  – Large Scale Greening of City Owned Vacant parcels
  – Over 2,800 parcels
Downspout Disconnection

• **Short Term**
  – Homeowner program
  – Free workshops/materials

• **After June 30, 2012**
  – Building and Safety inspection process
DWSD CSO Green Infrastructure Program

Draft 2011 Major Road Projects
Combined Sewer Overflow Project Area
DWSD CSO Green Infrastructure Program

Draft 2011 Major Road Projects
Combined Sewer Overflow Project Area

2011 Road Project
DWSO CSO Boundary
Greening Roads

- **Long Term**
  - Integrate into annual reconstruction and/or resurfacing projects
  - Standard specifications
Municipal Property

• **Short Term**
  – Assess pilot area opportunities
  – Public Works yard

• **Long Term**
  – Dependent on assessments
Other Important Implementation Aspects: Tracking Progress

- Modeling programs being evaluated
- Integrated GIS
- Tracking began in 2010
Other Important Implementation Aspects: Long Term Strategy

- Internal process for selecting & prioritizing
- Long-term estimated goals/benefits
Other Important Implementation Aspects: Public Messaging

- Developing Brand/Messaging
  - Detroit Residents
  - Region
  - Nation
The Big Picture
Questions?

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