

Save the Rain's Balanced Green-Gray Approach Pays Dividends for Onondaga County

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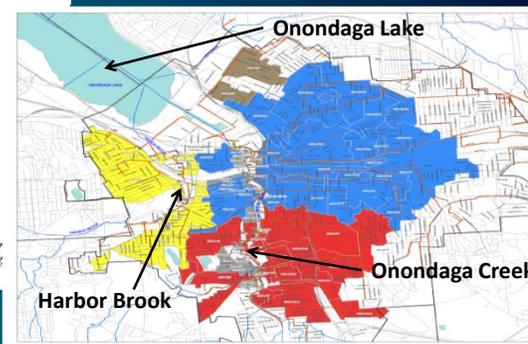
Presenting to the Capital District
Regional Planning Commission
October 15, 2015



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America's First Green Infrastructure Consent Order



- 7,660 acres
- 6.1 Billion Gallons Total Annual Combined Sewage Generated by the Metro Combined Sewer Service Area



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History

Onondaga Lake Facts

Watershed: 285 Square Miles

1 Mile Wide – 4.6 Miles Long

Average Depth: 35 feet

Max Depth: 63 feet

1940 – Swimming Banned

1970 – Fishing Banned

- 1988 – Atlantic States Legal Foundation files lawsuit against County
- 1998 – METRO consent judgment replaced with Amended Consent Judgment (ACJ)
- 2009 ACJ amended to authorize use of Gray and Green infrastructure



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1998-2008 CSO Abatement Accomplishments

- Developed System Model (SWMM)
- Separated and closed 12 CSO's
- Completed 1 storage facility (Erie Blvd)
- Constructed 4 Floatables Control Facilities (HB, Franklin, Teall, Maltbie)
- Completed 2 Regional Treatment Facilities (Midland, Hiawatha)
- At least 35 projects investing over \$350 million



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Previous Consent Judgment

Original Consent Order planned to build four (4) Regional Treatment Facilities (RTFs) in neighborhoods and business districts (1 of the 4 was built costing \$80 million; budget and schedule challenges)

Initial Projects Opposed by Community Residents and Businesses



RTFs required large conveyance pipelines with significant community disruption (budget and schedule challenges)



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Fourth Stipulation to the ACJ (2009)

- Agreed to by all parties (State, ASLF, County)
- Authorized use of Gray and Green infrastructure
- Requires Storage Facilities in place of RTFs
- Includes time extension for Construction, and Metro phosphorus effluent limit
- Balanced program provides additional water quality and community benefits
 - Improve Quality of Life (civic infrastructure investments), Promote Sustainability (beyond stormwater), Cost Benefit/Efficiency



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National and Regional Recognition

- US EPA Green Infrastructure Community Summit
- U.S. Water Prize
- NYS Environmental Excellence Award
- APWA Environmental Project of the Year (West Onondaga St.)
- StormWater Solutions Magazine Top Stormwater Project (Rosamond Gifford Zoo)
- American Academy of Environmental Engineers Honor Award (Water Street Gateway)



2013 US Water Prize Ceremony
Washington DC



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Multiple Community Benefits

- CSO Reductions
- Water Quality Improvements
- Regulatory Compliance
- Sewer Infrastructure Rehabilitation
- Civic Infrastructure Rehabilitation
- Community Interest and Support
- Voluntary Community Infrastructure Contributions (Rain Barrels, Rain Gardens, Tree Planting)
- Integrated planning process consistent with EPA vision
- Saving Money



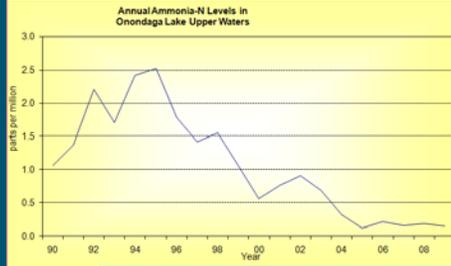
Harbor Brook CSO Treatment Wetland



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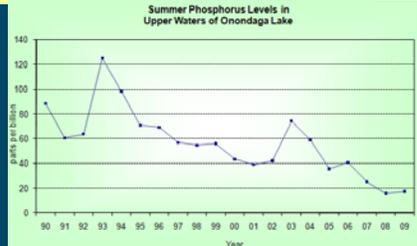
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Gray Infrastructure Program Builds on 10 Years of System Improvements



Ammonia decreased from 8,000 pounds per day (ppd) to less than 50 ppd

Phosphorus decreased from 300 ppd to 50 ppd



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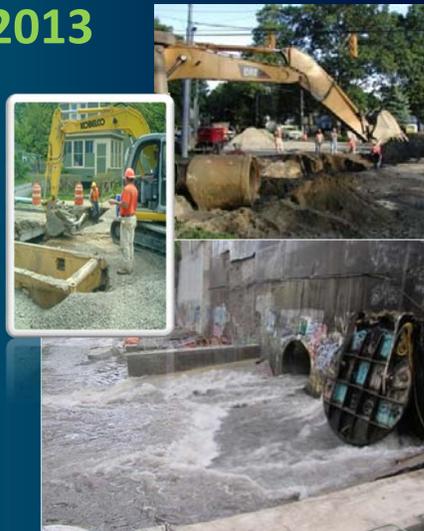
Gray Infrastructure Program Summary 2009-2013

Gray Projects

- Harbor Brook Interceptor (ARRA)
- Midland Conveyance (CSO 044)
- Clinton Storage Facility
- Harbor Brook Storage Facility and Conveyances
- Erie Boulevard Storage System (EBSS) Gate Chamber #3 Improvement
- Sewer separation projects

Facilities Planning

- Floatable Controls



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Gray Infrastructure – CSO Storage Facilities

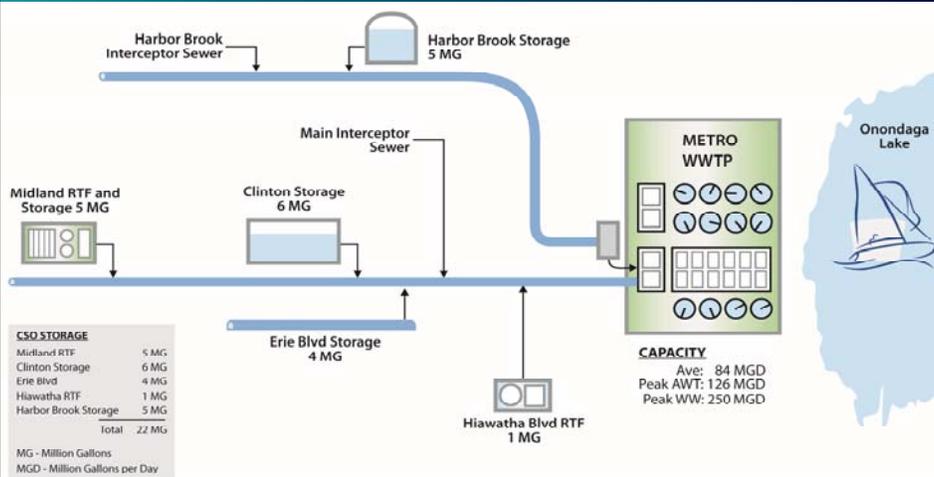
- Clinton (6.5 MG)
- Lower Harbor Brook (4.9 MG)



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Managing Storage and Treatment



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Balanced Program Brings Benefits to Gray Infrastructure

- **GI removes SW at source**
 - Avoids cost of conveyance, pumping and treating - \$2 per 1000 gallons avoided
 - Capacity in system and WWTP can be used to increase CSO capture and treatment with gray infrastructure
- **Expands and Improves Gray Infrastructure Options**
- **Green/Gray Projects focus on best of both**



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Gray Infrastructure Opportunities with Balanced Program

- **CSO Storage becomes More Feasible When combined with Green**
 - ✓ Storage Can be sized to fit the Space Available and balanced with Green Infrastructure to capture design storm
 - ✓ Storage Volume can be managed
- **Partial Sewer Separation can be combined with GI**
- **Smart use of existing infrastructure with Balanced Program**
- **Gray projects incorporate green components to enhance sustainability and community acceptance**



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Green Infrastructure Program Summary

2009 - 2018

- 169 projects throughout CSS
- Compliments Gray Program
- Total Gray + Green annual volume wet weather capture requirements:
 - 89.5% by Dec 2013
 - 91.4% by 2015
 - 93.0% by 2016
 - 95.0% by Dec 2018
- Extensive monitoring & reporting required

Before/After



Nicholas J. Pirro Convention Center
66,000 sq.ft. Green Roof (Completed 2011)



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County Executive Mahoney Announces "Project 50!"

"Onondaga County will construct fifty distinct green infrastructure projects to return rain water and snow melt to the ground instead of our sewer system."

Joanne M. Mahoney, State of the County Address,
March 1, 2011

Syracuse
recognized as one
of EPA's ten Green
Cities



Paradigm shifts from planning
to construction

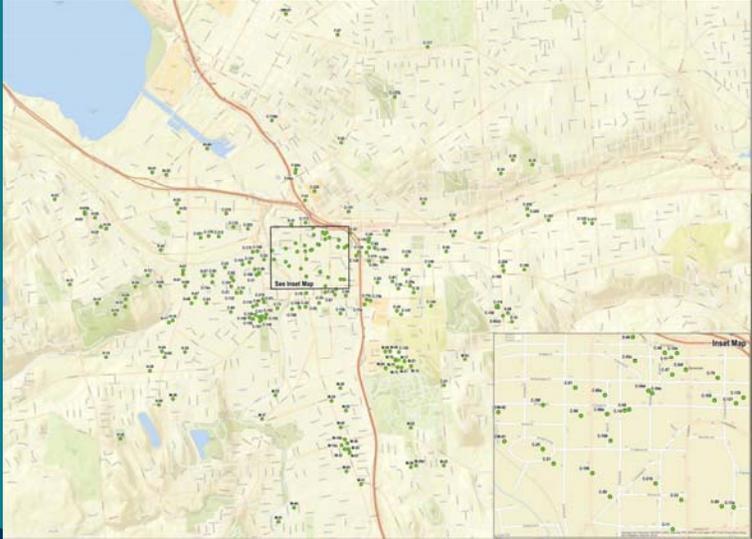


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Save the Rain Project Map

Over 175 projects completed and over 100,000,000 gallons of runoff reduction



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Benefits to Streetscape

Green Streets Installed Adjacent To No-Standing Lanes
Add Aesthetic Value Without Impacting Traffic or Pedestrians

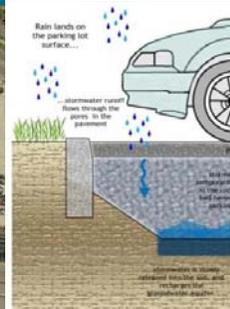
		
<p>BEFORE: Stormwater enters catch basins and is directly connected to sewer</p>	<p>PROPOSED (Photo Simulation): Stormwater is diverted to Green Streets and only overflows to sewer when necessary</p>	<p>AFTER (Actual Photo): Project has been adopted* by local business to pick up litter, weed, and mulch (provided by County)</p>

Adopt-A-GI Project program was created based on common Adopt-A-Highway format

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Benefits to County Facilities



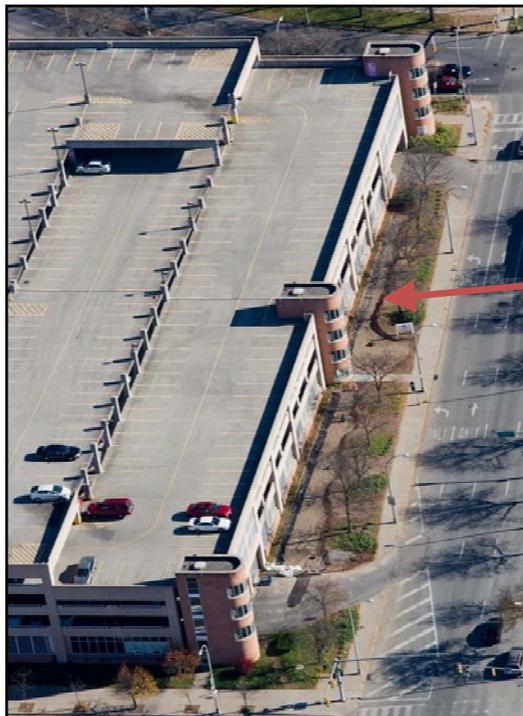
**OnCenter Convention Center
290 Parking Space Surface Lot**
(porous asphalt perimeter with subsurface storage and infiltration system)

Lot had many potholes and significant cracking; resurfacing paid for through CSO program. Improved safety through smarter layout, LED lighting, as well as electric vehicle charging station (from a separate funding source)



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OnCenter Municipal Parking Garage

Bio-Infiltration



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Benefits to County Facilities



Before

Vegetated Bio-retention System, including 90 new Trees



Surface Parking Lot next to Everson Art Museum

Previously a puddle-ridden gravel lot, new standard asphalt pavement drains to Bio-retention designed to store, slowly infiltrate, and provide evapotranspiration of runoff due to poorly draining soils; large storm events overflow to sewer



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Benefits to City Streets



Before

Award Winning Water Street Green Gateway Project

Completely new City Street (City paid for asphalt mill and paving, County program paid for all other work)



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Benefits to Typical Residential Streets



New City Street
Storage and Infiltration Trench no longer visible



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Benefits to Typical Residential Streets



Otisco Street
Residential Green Street
with Bioswale

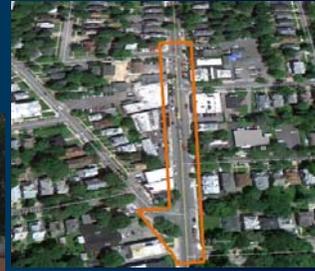
- New Curbs, asphalt, and sidewalks
- Traffic Calming (Bump Outs)
- Added green space



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Benefit to Commercial Districts



Westcott Street Commercial District
New Curbs, Sidewalks, and Asphalt
Improved Pedestrian Experience



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Benefits to City Streets



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Benefits to City Streets



West Onondaga Street Commercial District
New Curbs, Sidewalk, Asphalt
Improved Traffic Pattern
Added Green Spaces



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Benefit to Floatable Control Program

Inlet Filters, or Filter Inserts, are standard equipment at GI drainage inlets (catch basins) and capture a significant amount of street debris and pollutants at the source



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Addressing Vacant Lot Challenge



701 Oswego Street Vacant Lot Project



Save the Rain is managing stormwater runoff from multiple vacant lots in the City – and investing in new curbs, sidewalks, and putting these properties to beneficial use as nurseries and gardens



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Partnering with Parks



Leavenworth Park Bioinfiltration System

Project included new roadside granite curbs and carriage walk; plantings compliment park setting (County program has also resurfaced basketball courts, parking lots, and supported other park amenities)



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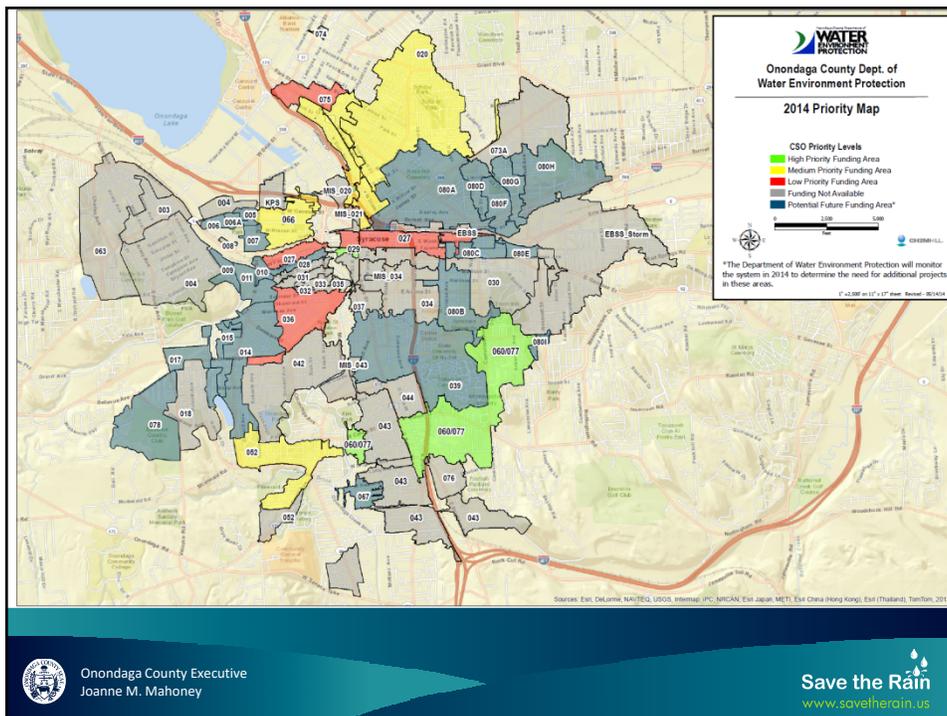
Onondaga County Save the Rain Green Improvement Fund

- Public-Private Partnership grant program to incentivize green infrastructure installation by businesses/nonprofits
- 140 applications received to date; 79 projects completed
 - Estimated annual stormwater runoff capture for completed GIF projects: **36.7 Million Gallons**



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Working with EFC to Develop GI Review and Funding Program

- First Gray/Green Project was ARRA with dedicated funds for Green Infrastructure
- Bundled 3 IUP Designated Projects into 1 for Green Funding
- Long Term Financing of \$12.8 million for completed Green projects
- Did not apply for short term due to smaller size and fast pace of these projects
- Established process for DEC approval based on review of annual reports where GI is defined



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Beyond Projects...

- Unit Price - Quantity Based Construction Procurements
 - Civil Site Work Contract
 - Landscape Installation and Maintenance Contract
 - Post-Warranty Maintenance Contracts (Green Roofs, Porous Pavement Vacuuming, Landscaping)
- Asset Management and Maintenance
 - Maximo for Work Order and Cost tracking (integrating with Community Workforce)
- Legislative Agenda: City Stormwater, Tree Ordinances

Onondaga County, New York
Save the Rain Program
Green Infrastructure
Maintenance Manual



Prepared for
Onondaga County, New York

Prepared by
CORNELL

January 2012

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Public Education and Outreach

- STR Website: www.SaveTheRain.us
- Quarterly Report: for ACJ Parties, County Legislature
- Coalition Partners / Stakeholders
 - City of Syracuse (DPW, Engineering, Law, School District, Parks, Zoning, Codes, etc.)
 - ACJ Parties (NYS DEC, ASLF): Policy Committee
 - Academic Community (SU, SUNY ESF, others)
 - Community Groups / NFPs
 - Business Community, Large Landowners (hospitals)
 - General Public
 - Manufacturers / Vendors / Suppliers
 - Engineering Community
 - Construction Community (M/WBEs)



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Benefits of Balancing Green & Gray

- **Saving over \$20M in capital cost** and reducing life cycle costs; **improved community assets** (sewers, roads, parking lots, roofing systems, vacant lots, parks, schools, and more)
- Revised program moved Green Infrastructure to **front of program**, implements a **smarter gray program**, extended compliance schedule by 5 years
- Environmental Benefit to lake and tributaries is **visible to Community**; able to appreciate why their utility rates have increased
- Green Infrastructure is at a neighborhood scale, building sense of community
- Integrated planning process consistent with EPA policy goals



Red Tailed Hawk at
Harbor Brook
CSO Treatment Wetland



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Questions?

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