GREEN INFRASTRUCTURE POLICY ANALYSIS:
ADDRESSING BARRIERS TO IMPLEMENTATION
IN THE GREAT LAKES REGION

Congressional briefing
September 5, 2018
What is Green Infrastructure (GI)?

Wide variety of stormwater management strategies:

• Natural areas (wetlands, forests)
• Nature-based engineered solutions (rain gardens, bioswales)
• Systems that imitate natural infiltration (permeable pavement)

Dequindre Cut, Detroit, MI (Credit: GLC)
Why is Green Infrastructure Important?

• Stormwater management is a growing regional problem

• Predominately local solutions include GI, which
  • Slows or decreases volume of urban runoff
  • Reduces flooding
  • Improves water quality

• Federal and state policies can help or hinder

Flooding in Sodus Point, New York
(Credit: Veronica Volk, Great Lakes Today)
Why Else is Green Infrastructure Important?

Other benefits
- Improves air quality
- Sequesters carbon
- Reduces heat urban heat island effect
- Provides pollinator habitat
- Can improve neighborhood aesthetics

1. Water quality of receiving bodies
2. Groundwater recharge
3. Biodiversity and ecology enhancement
4. Temperature reduction
5. Air quality improvement
6. Amenity and aesthetics
7. Recreation and health
8. Food security
9. Rainwater harvesting
10. Pumping and treatment reduction
11. Saving energy in buildings
12. Real estate value appreciation

(Alves et al 2018)
GLC’s Green Infrastructure Champions

• Addresses local barriers and capacity through competitive mini-grants and mentoring network

• Policy analysis targets federal, state, and provincial policies that hinder or enable local GI adoption
  • Partnership with Credit Valley Conservation
  • Recommendations developed with Advisory Team input and support
GLC Policy Analysis: What We Looked At

- U.S. Federal Policy
- Canadian Federal Policy
- Policies within Great Lakes States
- Policies within Ontario and Quebec
GLC Policy Analysis: Current Federal Management Framework

Combined sewer system (CSS)
• One set of pipes for sewage and stormwater
• Combined sewer overflow (CSO) control policy – nine minimum controls
  • Does not include GI or any volume control measures

Municipal separate storm sewer system (MS4)
• Stormwater conveyed to water body in dedicated pipes
• MS4 discharge permits
  • Post-construction runoff control MUST include implementation of BMPs

And.... **Consent Decrees**
Judicial Consent Decrees

- Come into play after Clean Water Act discharge permit violation(s)
- Compels wastewater treatment facilities to consider GI through prescriptive or descriptive requirements
- May foster innovation, but.....
- Costly and reactive

Consent decrees represent the extent enforceable US federal policy for Green Infrastructure

Fleet Avenue, Cleveland, OH (Credit: NEORSD)
Key Federal Funding Opportunity: Clean Water State Revolving Fund (SRF)

• Critical source of funding - $126 billion invested since 1987
• 20 percent of SRF funds earmarked for sustainability initiatives
  • Remains under-utilized

“Communities are sometimes reluctant to pursue green infrastructure solutions due to a lack of familiarity, inability to secure a repayment source, or other logistical barriers” (EPA 2015).
GLC Policy Analysis:
U.S. Federal Policy Gaps

- Only consent decrees incentivize or require GI
  - Reactionary, costly, limited geographic scope
- Under-utilization of available funding
- Limited mechanisms to support communities
  - Technical guidance
  - Workforce development
  - Public perception

Green roof on Chicago’s city hall. (Credit: EPA)
RECOMMENDATION 1: Fully Fund CWSRF

• Incentivize GI projects with interest rate reductions, prioritization, and funding eligibility extension
  • CWSRF is largest pool of funding available for stormwater management/GI, but is under-utilized for these types of projects
  • Maintaining funding critical, but seek opportunities to increase use for stormwater
RECOMMENDATION 2: Establish Performance-Based Requirements for Stormwater Management

- Foster innovation before need for consent decree arises
- Orient toward watershed outcomes; accommodate local conditions
  - Already occurring in several states: one inch of runoff must be retained from any new impervious surface in Minnesota

Green Garage, Detroit, MI (Credit: GLC)
RECOMMENDATION 3: Promote and Coordinate Integration of GI

• Integration into planning, research, technical assistance, and funding programs

• Federal agencies have existing collaborative efforts to build local capacity, but should be expanded

Connective Corridor: Forman Park (Credit: Save the Rain)

The Enclave, Ingersoll, ON (Credit: GLC)
Questions?
Green Infrastructure in the Great Lakes Basin: Public Private Partnerships and Market Based Options

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Congressional Briefing
Cannon House Office Building
Washington, D.C.

September 5, 2018
Green Infrastructure

- Rain Gardens
- Trees
- Greenways, Park Space
- Bioswales
- Wetlands
- Green Roofs
- Landscaping or Soil Amendments
- Green Streets, Alleys, Parking
- Rainwater Catchment
- Porous Pavement
Why Even Bother With Green Stormwater Infrastructure?
Why Even Bother? Government Perspective

Helps Mitigate the Fastest Growing Source of Water Pollution Worldwide By Restoring Nature in Cities.

42% OF U.S. URBAN LAND WILL BE REDEVELOPED BY 2030

5X RUNOFF FROM A CITY BLOCK VS. A FOREST

$100B NEEDED TO FIX U.S. STORMWATER INFRASTRUCTURE

772 CITIES FACING LEGAL ACTION BY EPA
Why Even Bother? Business Perspective

Better Story Telling, Lower O&M Costs, and A Range of Other Benefits

Herman Miller
2004 – ZERO WATER FOOTPRINT GOALS SET

Ford Motor Company
2020 – REDUCE WATER USE BY 72%/VEHICLE

Bell’s Brewery
FILLER PUMP DESIGN TO SAVE 2.5 MIL GAL/YR

Coca-Cola Company
ANNOUNCED IN 2016 THAT THEY HAD MET 100% REPLACEMENT GOALS FOR WATER USE
Great Lakes: Challenges & Drivers
Challenges...... and Opportunities

- Reduced infrastructure investments
- Environmental challenges such as public health – safe drinking water
- Regulatory drivers leading to environmental stewardship

Solutions need to be financially viable!
Infrastructure Investment Gap is Growing

Public Spending on Transportation and Water Infrastructure, by Level of Government, 1956 to 2014

Billions of 2014 Dollars


State and Local Governments

Federal Government

Source: Congressional Budget Office based on data from the Office of Management and Budget, the Census Bureau, and the Bureau of Economic Analysis.

Note: Dollar amounts are adjusted to remove the effects of inflation using price indexes for government spending that measure the prices of materials and other inputs used to build, operate, and maintain transportation and water infrastructure.
Environmental Challenges to the Great Lakes Basin

- Excessive nutrient loading (Algal bloom)
- Climate change related changing meteorological patterns (Need for climate resiliency measures)
- Hydromodifications/flashiness (Top impairment in most 305b reports in the basin states)
- Invasive species
Regulatory Drivers: Stormwater/Wet Weather

- ~$100B* in wet weather/stormwater needs
- 7,500 communities regulated municipal separate storm sewer systems (MS4s) in the U.S.
- 772 combined sewer systems in the U.S.
- Growing interest and public demand for green infrastructure
Opportunities.... Spectacular Savings via Aggregation

Market-based Options: Market Size & Varieties
Market Size of Green Infrastructure in the Great Lakes Basin

- In states of Ohio, Minnesota, Wisconsin, Illinois, and Indiana: A third of utility revenues can support over a billion dollars investment
- New York, Pennsylvania, and Michigan are at a significant disadvantage
Alternative Project Delivery Frameworks & Project Financing Options

- **Alternative project delivery models**
  - P3s
  - CBP3s
  - Pay-for-success

- **Financing sources**
  - Public finance
  - Private finance
Market-based Options Can Offer Solutions with the Community at the Center

- Public Health Protection
- Regulatory Compliance
- Financial Stewardship
- Local Hires, Training, & Workforce Development
- Community Members
- Water Quality & Recreation
- Local, Small Disadvantaged Business Marketplace
- Infrastructure Improvement Investments
- Green Programs
Recommendations
Recommendations

- Promote and coordinate the use of GSI
- Leverage WIFIA (great job!)
  - Incorporate priorities that lead to GSI use
  - Establish performance-based requirements for stormwater management
- Fully fund CWSRF
  - Promote market-based options by considering creative changes such as pay-for-success related guarantees
P3GreatLakes: A Team of Innovators & Social Entrepreneurs
Questions?

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NO access to Clean Drinking water
- 750 Million people worldwide

Water Scarcity
- 4 billion people worldwide
EXHIBIT 4. FRESHWATER WITHDRAWALS AS A PERCENT OF AVAILABLE PRECIPITATION (2005)
Green Stormwater Infrastructure

September 5, 2018 – Gary Belan
The Problem

The Prevalence and Cost of Urban Flooding -
The Center for Neighborhood Protection

- Urban flooding in Cook County, IL is chronic and systemic, resulting in damage that is widespread, repetitive and costly.

- There is no correlation between damage payouts and the floodplains: when all types of claims are aggregated, some of the Cook County ZIP codes with the highest concentration of payouts (number and value) have no land area within federally designated floodplains.

- Claims were made across income groups, however 67 percent of the 27 ZIP codes with the highest concentrations of damage earn below the average.
Green Infrastructure Initiatives

- **Detroit** Water and Sewerage Department – plans to spend $50 million on GI projects to reduce CSO volumes by 10 – 20%.

- Northeast Ohio Regional Sewer District (**Cleveland**) – Plans to spend $42 million to capture 44 million gallons of water with GI.

- **Buffalo** Sewer Authority – Significant GI implementation program and modification of 1,620 acres of publicly owned lots (vacant) to store and infiltrate stormwater runoff - $96.2 million.
Green Infrastructure Initiatives

**Milwaukee** Metropolitan Sewerage District – hopes to capture at least 500 million Gallons of stormwater with GI.
Maywood Avenue Project

- Project to reduce stormwater entering the CSO, quantify CSO volume reduction and cost per gallon.

- Results show that the City, which has a tunnel expansion project identified in the LTCP for 3.0 MG at a capital cost of $22M, could use 3.6 miles of bioswales to provide 3.0 MG of “surface storage” at a cost of $6.6M.
Hensville Project

Local funding used with some AR support

Completed at minor league baseball stadium

Focus is on education about City’s efforts on GSI
Regulatory responses not keeping pace with impacts, or emergence of green infrastructure

- Increasing trend toward embrace of decentralized, “green infrastructure” management approaches
- Regulatory structures often at odds with green infrastructure principles
- Tension between permitting and a community’s water quality needs
Fully Funding the CWSRF

- Green Project Reserve
  - Maywood Avenue Project
- Consent Decrees
  - Cities around the Great Lakes incorporating GSI
Thank You

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