# Neighborhood, Environment, and Water Collaborations for Green Infrastructure
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## Lisa Wallick , P E, Stormwater Management Group Manager



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Green Infrastructure on Vacant Land: Achieving Social and Environmental Benefits in Legacy Cities

Nathaniel Lichten, Joan Iverson Nassauer, Margaret Dewar, Natalie R. Sampson, Noah J. Webster

NEIGHBORHOOD, ENVIRONMENT, AND WATER RESEARCH COLLABORATIONS FOR GREEN INFRASTRUCTURE NEW-GI WHITE PAPER NO. 1 FEBRUARY 15, 2017
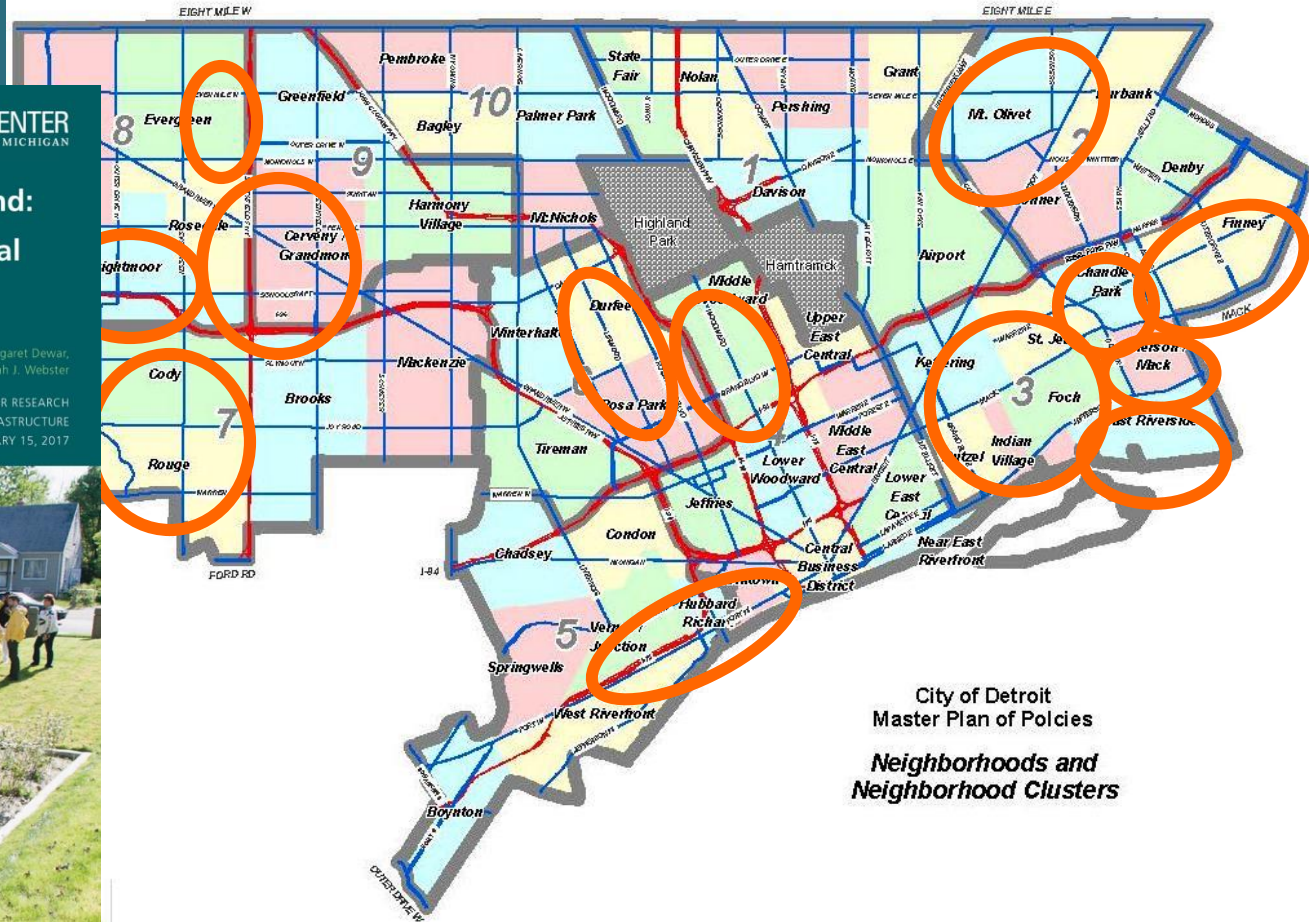
City of Detroit
Master Plan of Polcies

Neighborhoods and
Neighborhood Clusters

# Knowledge Domains

Aquatic Ecology, Toxicology,
Civil Engineering, Environmental Engineering, Landscape Architecture,
Landscape Ecology, Law, Public Health, Sociology, Urban Planning

**The land-based green infrastructure design innovation**:
Fill the excavation of former basements in demolished buildings with porous soils to retain stormwater drained from the street. Design this form of GI to look like a garden for the enjoyment but not the entry of passers-by.
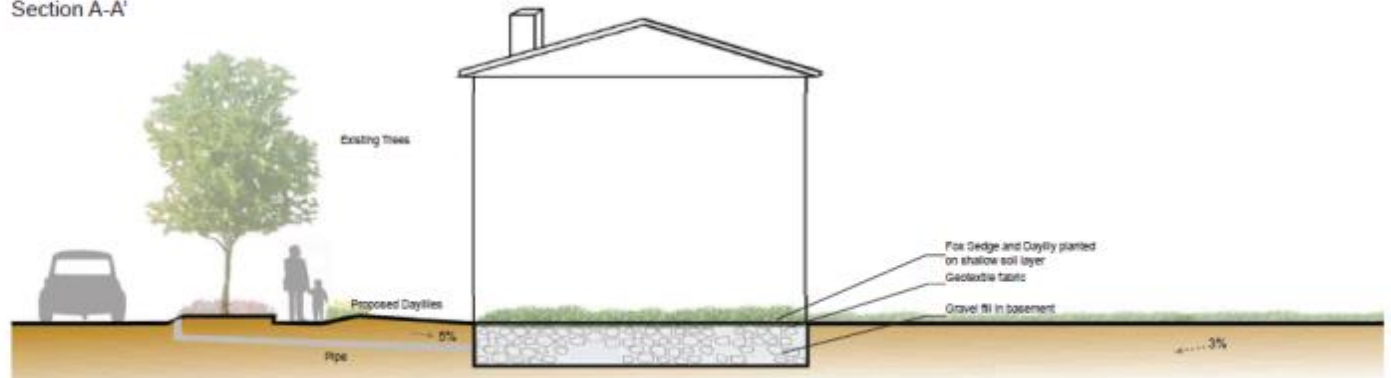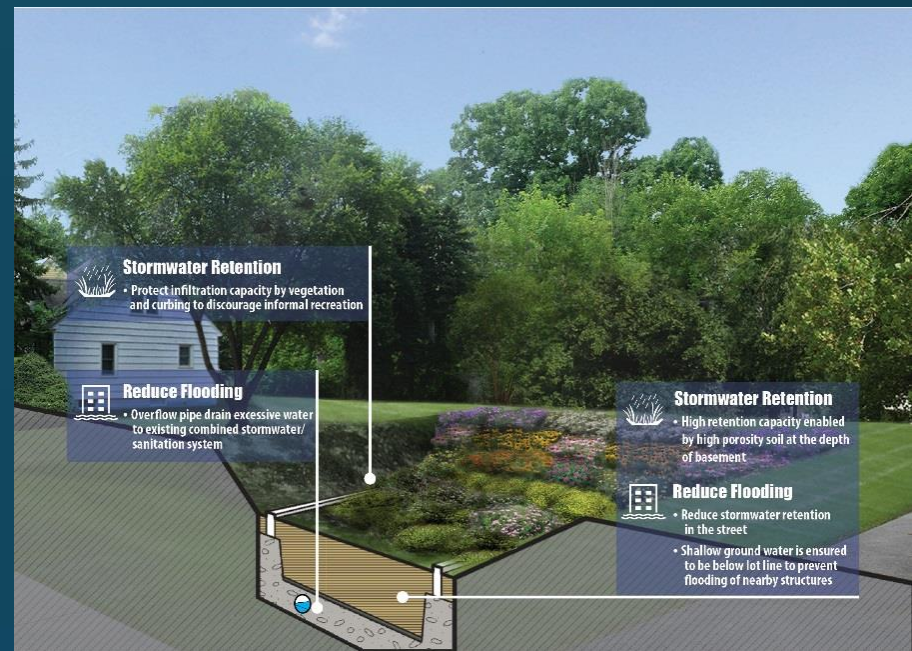


Demolition in progress

Base Condition: Poor condition (3 or 4 condition) house slated for demolition

Section A-A'

Existing Trees

Fox Sedge and Daylily planted on shallow soil layer
Geotextile fabric
Gravel fill in basement

Proposed Daylilies

Pipe

Neighborhood experience design hypotheses
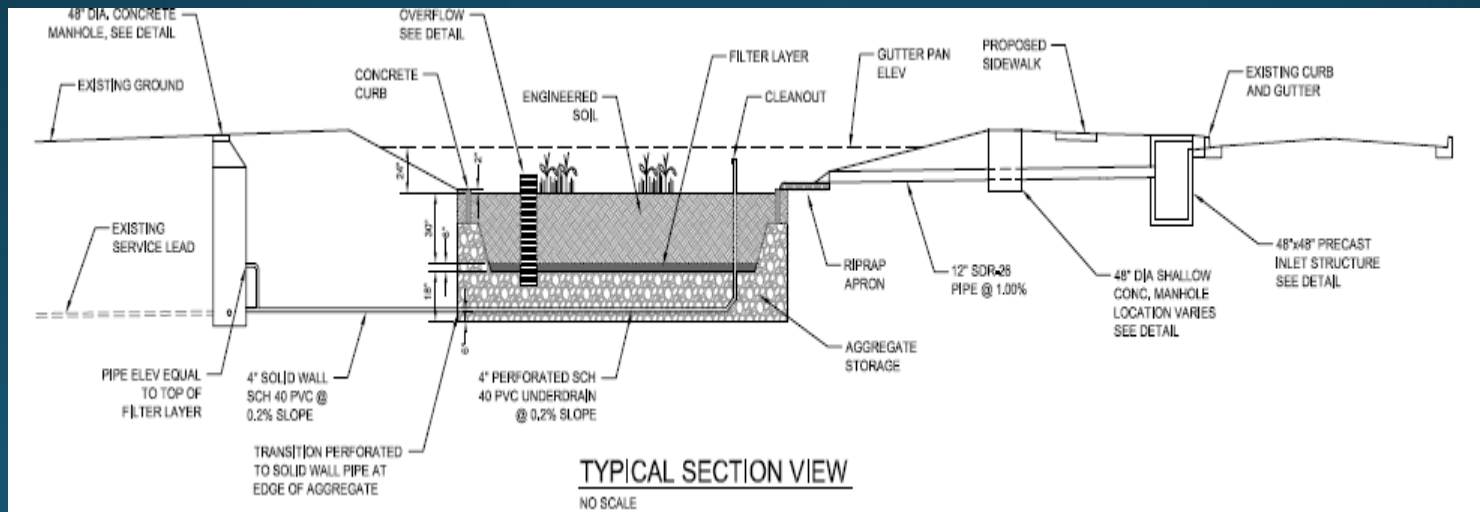


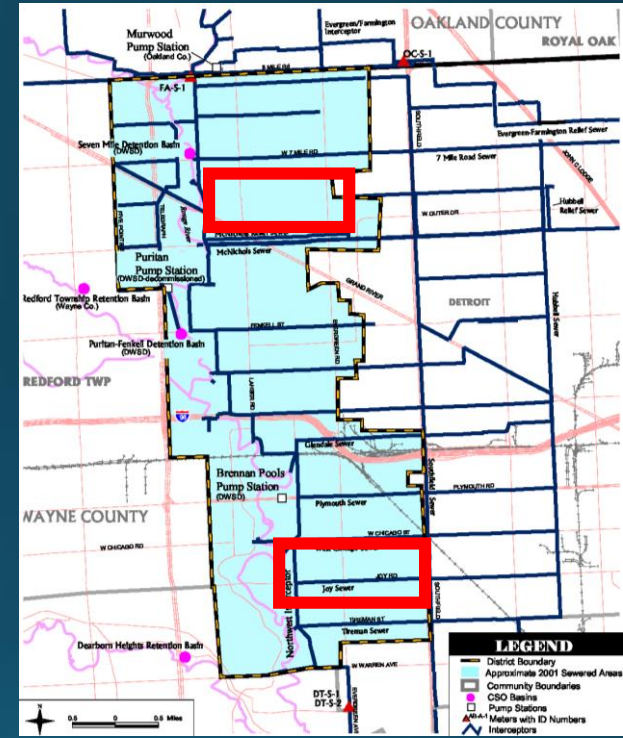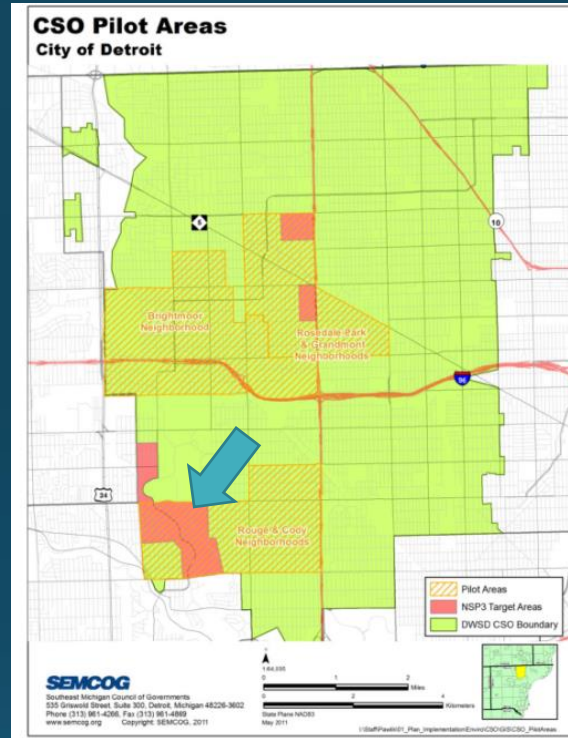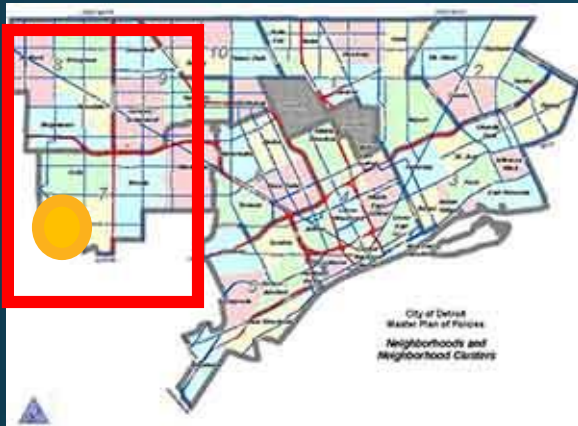Stormwater management design hypotheses



Image and Detail design: Tetra Tech

# Site selection: Detroit Land Bank Authority demolition sites with Detroit Water and Sewerage street storm water retention opportunities and City of Detroit advised community engagement



- DWSD worked with Nassauer design lab , McElmurry environmental engineering lab, and Allen aquatic toxicology to develop design  and water sampling specs and let bids for ecological designs and water sampling structures.  DWSD worked with DLBA to arrange permitting.

- DLBA and Department of Neighborhoods worked with our team to refine citizen engagement approaches, including engagement of other City departments, including Public Safety.

**Neighborhood, Environment & Water Research Collaborations for Green Infrastructure (NEW-GI)** links Detroit's vacant property demolition process with new forms of green infrastructure (GI) designed to manage stormwater and increase resident well-being where vacant property is changing neighborhoods.

**PHASE ONE (2014-2015):**
- Developed bioretention flower garden designs and constructed pilot sites including water quality assessment instrumentation
- Initial survey of 164 neighborhood residents living within 800" of pilot sites
- Studied GI and vacant property governance in Detroit and Cleveland

**PHASE TWO (2016-2018):**
- Assessing pilot gardens' social and environmental performance
- Bringing pilot gardens' design concepts to scale across a CSO watershed
- Reviewing governance of vacant properties as it relates to GI in other legacy cities: Cleveland, Baltimore, Milwaukee, Philadelphia, New Orleans, Gary, Buffalo; Washington, DC, Pittsburgh, Royal Oak, Southfield.
- Reviewing and synthesizing scholarly literature across many disciplines related to GI
- Producing guidance documents for local GI stakeholders: Technical Advisory Report 2016, White Paper 2017, and more to come...
- **For information: newgi-contact@umich.edu**

# Lessons learned  so far

- GSI can address challenges of property vacancy and related disparities
- Different extant soils, relief, grey infrastructure, land uses and vacancy patterns suggest different GSI design approaches
- Maintenance is key to effective GSI – for environmental and social performance
- Maintained GSI, designed to respect residents' norms and preferences, can enhance perceptions of neighborhoods and residents' health
- Collaborative cross-sector efforts that engage residents are needed.



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Benefits in Legacy Cities**

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