Green Infrastructure Champion Training: Part 9
“Developing Green Infrastructure Masterplans for Entire Sites, Neighborhoods, and Townships”

May 8, 2020
Duke Farms
Hillsborough, NJ
Via Webinar

Rutgers Cooperative Extension Water Resources Program
Toby Horton & Christopher Obropta
Green Infrastructure Champions Program

This program is partially funded by the Rutgers New Jersey Agricultural Experiment Station, The Geraldine R. Dodge Foundation, and NJ Sea Grant Consortium and is a collaboration of the Rutgers Cooperative Extension Water Resources Program, the Green Infrastructure Subcommittee of Jersey Water Works, and Duke Farms.
Draft

Impervious Cover Reduction Action Plan for
Hillsborough Township, Somerset County, New Jersey

Prepared for Hillsborough Township by the
Rutgers Cooperative Extension Water Resources Program

September 5, 2015
HILLSBOROUGH: GREEN INFRASTRUCTURE SITES

SITES WITHIN THE LOWER RARITAN RIVER SUBWATERSHED:
1. Duke Farms: Cottages

SITES WITHIN THE PIKE RUN SUBWATERSHED:
2. Hillsborough Star Diner
3. Mountain View Plaza

SITES WITHIN THE ROYCE BROOK SUBWATERSHED:
4. Auten Road School
5. Boro Kid Zone
6. Claremont Towers
7. Corporate Building
8. Doctors Way Offices
9. Eves Drive
10. Fire Department and Radiology
11. Harold Docherty Memorial Park
12. Hillsborough Business Center: Building 29
13. Hillsborough Business Center: Building 30
14. Hillsborough Center
15. Hillsborough High School
16. Hillsborough Middle School and
   Triangle Elementary School
17. **Hillsborough Municipal Building and Library**
18. JK Design
19. Mary Mother of God Church
20. Paramount Gymnastics
22. Shopping Complex of Annwell
23. Sunnymead Elementary
24. US Post Office

0 0.5 1 2 Miles
HILLSBOROUGH MUNICIPAL BUILDING AND LIBRARY

Subwatershed: Royce Brook
Site Area: 1,397,452 sq. ft.
Address: 379 South Branch Road
Hillsborough, NJ 08844
Block and Lot: Block 149, Lot 1.02

Rain gardens can capture, treat, and infiltrate runoff from the parking lots. Additional stormwater can be infiltrated with pervious pavement. A preliminary soil assessment suggests that more soil testing would be required before determining the soil’s suitability for green infrastructure.

<table>
<thead>
<tr>
<th>Impervious Cover</th>
<th>Existing Loads from Impervious Cover (lbs/yr)</th>
<th>Runoff Volume from Impervious Cover (Mgal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>%</td>
<td>sq. ft.</td>
<td>For the 1.25&quot; Water Quality Storm</td>
</tr>
<tr>
<td>22</td>
<td>304,677</td>
<td>14.7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Recommended Green Infrastructure Practices</th>
<th>Recharge Potential (Mgal/yr)</th>
<th>TSS Removal Potential (lbs/yr)</th>
<th>Maximum Volume Reduction Potential (gal/storm)</th>
<th>Peak Discharge Reduction Potential (cu. ft./second)</th>
<th>Estimated Size (sq. ft.)</th>
<th>Estimated Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bioretention systems</td>
<td>0.610</td>
<td>102</td>
<td>45,217</td>
<td>1.70</td>
<td>5,920</td>
<td>$29,600</td>
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<tr>
<td>Pervious pavements</td>
<td>0.998</td>
<td>167</td>
<td>73,902</td>
<td>2.78</td>
<td>6,950</td>
<td>$173,750</td>
</tr>
</tbody>
</table>
Demonstration Gardens to Full Site Sustainability Masterplans
Demonstration Gardens to Full Site Sustainability Masterplans

HILLSBOROUGH, NJ
MUNICIPAL COMPLEX
SUSTAINABILITY MASTERPLAN
CONCEPTUAL DESIGN

Rutgers Cooperative Extension
Extension Specialist: Tobias Horton
County Environmental Resource Agent: Pat Rector
GREEN INFRASTRUCTURE RECOMMENDATIONS

Hillsborough Municipal Building and Library

- Orange: pervious pavements
- Yellow: bioretention / rain gardens
- Blue: drainage areas
- Black: property line
- Black with white border: 2012 Aerial: NJOIT, OGIS

Scale: 0 - 75' - 150'
Demonstration Gardens to Full Site Sustainability Masterplans

HILLSBOROUGH, NJ
MUNICIPAL COMPLEX
SUSTAINABILITY MASTERPLAN
CONCEPTUAL DESIGN
Rutgers Cooperative Extension
Extension Specialist: Tobiah Horton
County Environmental Resource Agent: Pat Rektor
Goals of a Landscape Sustainability Masterplan

• Fundamentally change the way people experience their towns/cities
• Align currently uncoordinated efforts in Green Stormwater Infrastructure, Grey Stormwater Infrastructure, Transportation Planning, Greenspace Advocacy, Conservation, etc.
• Collaborate across disciplines, fields, and interests to improve the quality of life through improving the quality and access to nature
Objectives of a Landscape Sustainability Masterplan

• Work from funded installation projects towards a larger vision
• Strengthen working groups developed during small project planning and installation
• Appeal to different interest groups using themes in the Plan to join effort
• Conceptualize ‘ways forward’ to future projects
• Synthesize with existing and ongoing municipal and regional plans
Phase 2 of the Hillsborough Municipal Complex Landscape Sustainability Masterplan
Phase 2 of the Hillsborough Municipal Complex
Landscape Sustainability Masterplan

Paths to nowhere?

On to the next project...
Hillsborough Municipal Complex Landscape Sustainability Masterplan
Eagle Scout Project
Hillsborough Municipal Complex Landscape Sustainability Masterplan
Pollinator Garden, Gold Token Girl Scout Project
Pollinators
Their importance to our world

What is a Pollinator?
Pollinators are vital to most of our food production in America. Pollinators can be bees, butterflies, and even birds. These animals are significantly responsible for the reproduction of many of our favorite fruits and vegetables. They have been an essential part of the ecosystem for thousands of years, helping to ensure the propagation of plants. In order to stop the decline and become an essential part of their populations, gardens like these can be made to provide another breeding and pollination stop for these crucial creatures. Making a difference towards this movement is not hard, just one plant could be enough to help hundreds of bees and butterflies!

What is in this Garden?
This assortment of flowers are just some of the many that attract and accommodate pollinators. The major plants you can see here include: Butterfly Bush, Salvia, Statice, Coreopsis, Lavender, Marigold, aster, Thymus, Vernonia, and Coneflower. You also see a collection of wildflowers in the middle which serve as a stop for "teas cats" where they can be in a planted area. These also help the butterflies that collect on bees and other insects surrounding the nodes. The four-legged flower is to attract some aseasonal friends as well.

How can YOU Help?
Installing just one of these plants into your yard or home is enough to make a difference in pollination in our community. Local garden centers are just as interested in this cause and are more than happy to help you pick the perfect plant for your pollinator project.

This pollinator garden was dedicated to Hillsborough Township as the Gold Award Project of Brynne Briega. Thank you to these sponsors for making this project possible!
Demonstration Gardens to Full Site Sustainability Masterplans

Phase 3
Completed
Summer 2017

Phase 4
Completed
Summer 2017
Girl Scout Project

Phase 5
Designed
Eagle Scout Spring 2019

Phase 1 & 2 Completed
Summer 2016
Summer 2017 Eagle Scout Project

Phase 6
Path to Memorial
Spring 2019

Future Phases
Demonstration Gardens to Full Site Sustainability Masterplans

**Phase 3 Completed Summer 2017**
- Pollinator Master Gardeners, Boy/Girl Scouts, School Science Groups...
- Porous Asphalt
- BID, Township, Watershed Association...

**Phase 1 & 2 Completed Summer 2016**
- Nature and Fitness Path
  - Health Groups, Insurance Companies, Doctors Associations, etc.
- Stream Restoration
  - Nature Focused Non-Profits, Watershed Associations...
- Phase 4 Completed Summer 2017
  - Girl Scout Project
- Phase 5 Designed Eagle Scout Spring 2019
- Phase 6 Path to Memorial Spring 2019
- Future Phases
- Agricultural History Garden - Historical Society, Local Farm Group, Individual Farmers, Food Non-Profits, Community Gardens...
- Forest Gardens – Nature Focused Non-Profits, Watershed Associations...

**HILLSBOROUGH, NJ MUNICIPAL COMPLEX SUSTAINABILITY MASTERPLAN CONCEPTUAL DESIGN**
Rutgers Cooperative Extension
Extension Specialist Tobiah Horton
County Environmental Resource Agent Pat Recker
7. Green Buildings and Environmental Sustainability Plan Element *

Prepare a Green Buildings and Environmental Sustainability Plan Element. This new element would serve as the basis for incorporating green building and sustainability practices into the Land Use and Development Ordinance.
SITES WITHIN THE ROYCE BROOK SUBWATERSHED

1. Auten Road School
2. Boro Kid Zone
3. Claremont Towers
4. Corporate Building
5. Doctors Way Offices
6. Eves Drive
7. Fire Department and Radio
8. Harold Docherty Memorial
9. Hillsborough Business Center
10. Hillsborough Business Center
11. Hillsborough Center
12. Hillsborough High School
13. Hillsborough Middle School
14. Triangle Elementary School
15. Hillsborough Municipal Building
16. JK Design
17. Mary Mother of God Church
18. Paramount Gymnastics
19. R C Fine Foods Inc.
Elements of a Township-Wide Landscape Sustainability Masterplan

- Destinations connected to neighborhoods by walkable/bikeable corridors

- Stormwater kept on the surface in attractive amenities that mimic the performance of natural systems

- Remnant natural lands preserved and restored

- Social and cultural features and activities in the landscape are integrated with environmental improvements
Elements: Township Landscape Sustainability Masterplan: 
Places and Connections

**Places – Home - Destinations – “Nodes”**

**Small:**
- residences
- playgrounds
- pocket parks
- urban sites,
- vacant lots to be reused
- schools w/ out land
- small historic sites
- detention basins
- lakes/ponds

/ these are the locations for site scale green infrastructure installations

**Large:**
- Neighborhoods
- parks
- school campuses
- municipal complexes
- large historic sites
- cemeteries
- corporate parks
- business parks
- shopping areas, etc.

/ these are sites for large scale green infrastructure plans – knitting together smaller installations

**Connections - Streets – Paths – Streams – “Corridors”**

- Streets (especially wide streets)
- rails to trails
- linear parks
- river/floodplain parks
- stream corridors
- linear parks (e.g. D & R Canal)
- aggregated vacant lands
- infrastructure corridors (wide highway ROWs, rail line ROWs, power line/pipeline ROWs)
- historical corridors/trails
- waterfronts

/ these are the connective tissues that ensure that people, water, and wildlife flow through the landscape in safe, healthy, and attractive ways
Site Sustainability Masterplans to Neighborhood/Township
GSI Initiated Green Infrastructure Sustainability Masterplans

Hillsborough, New Jersey
Site Sustainability Masterplans to Neighborhood/Township
GSI Initiated Green Infrastructure Sustainability Masterplans

Dense Tree Cover
Site Sustainability Masterplans to Neighborhood/Township
GSI Initiated Green Infrastructure Sustainability Masterplans

Streams
Site Sustainability Masterplans to Neighborhood/Township
GSI Initiated Green Infrastructure Sustainability Masterplans

Floodplains
Site Sustainability Masterplans to Neighborhood/Township
GSI Initiated Green Infrastructure Sustainability Masterplans

Detention Basins
Site Sustainability Masterplans to Neighborhood/Township
GSI Initiated Green Infrastructure Sustainability Masterplans

Destinations

Library
Recreation
High School
Shopping
Site Sustainability Masterplans to Neighborhood/Township
GSI Initiated Green Infrastructure Sustainability Masterplans

Destinations and Origins
Site Sustainability Masterplans to Neighborhood/Township
GSI Initiated Green Infrastructure Sustainability Masterplans

Bike and Pedestrian Paths
Site Sustainability Masterplans to Neighborhood/Township
GSI Initiated Green Infrastructure Sustainability Masterplans

Complete Streets
Site Sustainability Masterplans to Neighborhood/Township
GSI Initiated Green Infrastructure Sustainability Masterplans

Safe Thoroughfares and Intersections
What Would a Neighborhood Look Like?
What Would a Neighborhood Look Like?
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What Would a Neighborhood Look Like?
Steps Towards Achieving this Type of Plan

Municipal:
- Demonstration Projects
- Grants
- Training of DPW/Parks

Neighborhoods:
- Rebate Programs
- Neighborhood Associations
- Individual Efforts

Natural Lands:
- Non-profit sector
- Grants
- Citizen Groups
- Neighbors/Friends of...

Corridors:
- DOT Projects
- Advocating Water BMPs
- Transportation Advocates
- Bike/Ped Advocates
- Health Advocates

Local Champions make it all happen!
Steps Towards Achieving this Type of Plan

Local Champions make it all happen!
Green Infrastructure Champions Program

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Chat with “smellor”