Passaic County
Green Stormwater Infrastructure Element &
Green Streets Pilot Project

NJDOT Tech Talk
June 5, 2019
What is Green Infrastructure?

Traditional “Gray” Infrastructure VS. Green Infrastructure
What is Green Infrastructure?

Traditional “Gray” Infrastructure vs. Green Infrastructure
Why is Green Infrastructure Important?

Green Infrastructure, used in concert with traditional stormwater management facilities, is intended to reduce and infiltrate as much runoff as possible before it enters the storm sewer network.

When rain falls, it causes stormwater to runoff across paved surfaces such as parking lots, rooftops, and streets.

Stormwater can pond on these paved surfaces, causing localized flooding of streets and neighborhoods.

The stormwater also picks up trash, bacteria, and other pollutants along the way and can carry them to our streams, rivers, ponds, and lakes.

The stormwater also provides many other benefits, including beautification of neighborhoods, creation of public open spaces, improvement of streets for pedestrians and bicyclists, improvements in air quality, and provisions for wildlife habitat.

Green infrastructure captures stormwater at the source.

Green infrastructure allows stormwater to be absorbed and filtered by soil and plants in order to slow down and clean stormwater.

Green infrastructure also reduces the need for costly infrastructure projects, improves water quality, and enhances the ecosystem services provided by green infrastructure.
Benefits of Green Infrastructure

- Mitigating stormwater/flooding
- Enhancing water quality
- Improving aesthetics
- Reducing impervious cover
- Fostering climate resilience
- Providing wildlife habitat
- Promoting economic benefits
- Increasing recreational opportunities
- Reducing heat island effect
What is the Green Stormwater Infrastructure Element of the Passaic County Master Plan?
The Planning Process

February 2017: Project initiation
March – June 2017: Research of existing plans and policies
May 2017: Public Meeting #1
July 2017 – March 2018: Development of draft document
April – June 2018: Completion of final document for NJTPA
June 2018: Public Meeting #2
July – October 2018: Final revisions to document
November 2018 – January 2019: Approval of document as a new element of the Passaic County Master Plan.
Ongoing: Development of implementation plan and revision of development review standards
Who Informed the Planning Process?

Professional Input
- Passaic County Planning & Engineering Staff
- Consultants
- Inter-Agency Team
- Technical Advisory Committee
- Engineer Focus Group
- Technical Expert Interviews

Community Input
- Public via...
  - Open House
  - Paterson SMART Event
  - Online Survey and Interactive Map
  - Public Presentation
- Community Organization Focus Group
Who Informed the Planning Process?

Public Meetings

● Open House
  ○ May 24, 2017
● Paterson SMART Event
  ○ Sept. 13, 2017
● Public Presentation/Q&A Session
  ○ June 11, 2018
● Public Hearing (Master Plan Adoption)
  ○ Nov. 29, 2018
What Did We Hear From Stakeholders?

Professional Input
- County regulations should apply to development at thresholds below NJDEP standards (1/4 acre of new impervious surfaces / 1 acre of disturbance)
- Cost of construction and maintenance are major concerns
- Need to assign responsible party for maintenance
- Provide as much guidance and technical data as possible to make it easier for engineers to implement
- Provide guidance documents to municipalities to encourage local implementation

Community Input
- Localized flooding and pooling of water in the streets is both dangerous and inconvenient
- Inadequate stormwater management leads to property damage (landscape degradation, structural damage, water in basements)
- Need to assign responsible party for maintenance

Survey Results
*(Ranking of Green Infrastructure Benefits)*
1. Improved Water Quality
2. Improves Air Quality
3. Reduces Stormwater and Localized Flooding
4. Tied for 4th
   - Economic Benefits
   - Improves Aesthetics
   - Increased Recreational Opportunities
5. Increased Wildlife Habitat Area
Development Review Recommendations

- Analyzed the last 10 years of Site Plan and Subdivision review (2007-2017)
  - Categorized site area and square footage of new impervious area created, in order to determine the appropriate regulatory cut-off that would exclude development of smaller parcels and site plans for renovations/minor additions

- **Recommendation**: Require stormwater mitigation using Green Infrastructure for sites proposing 2,500 sq. ft. or more new impervious area
  - Focuses regulations on larger impact sites with more involved engineering
  - The mitigation requirement would only apply to the additional impervious area and not to entire sites
  - Would require maintenance plan and be reported on annually by Planning staff
Green Infrastructure Element

Stormwater Management Guidance Manual
Green Infrastructure Element: Bioretention
Green Infrastructure Element: Bioretention

Rain Garden

Stormwater flows downhill into garden from surrounding area.

Stormwater is piped from the street to the garden.

Plants filter water and enhance streetscape. Water filters through soil.
Green Infrastructure Element:
Pervious Paving
Green Infrastructure Element:
Cisterns
Green Infrastructure Element:
Other

Grass Swale
Wet Pond
Constructed Wetlands
Green Infrastructure Element

Green Streets Guidelines
Green Infrastructure Element: Green Streets

1. Rain Garden/Bioswale
2. Grass Swale
3. Stormwater Planter
4. Stormwater ROW Bumpout
5. Downspout Planter
6. Stormwater Tree Pit
7. Stormwater Tree Trench
8. Pervious Paving
9. Subsurface Infiltration and/or Extended Detention System

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<th>LAND USE TYPE</th>
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Passaic County
New Jersey
Green Infrastructure Element:
Green Streets

Regional Street

Stormwater BMP Key
1. Rain Garden/Bioswale
2. Grass Swale
3. Stormwater Planter
4. Stormwater ROW Bumpout
5. Downspout Planter
6. Stormwater Tree Pit
7. Stormwater Tree Trench
8. Pervious Paving
9. Subsurface Infiltration and/or Extended Detention System
Green Infrastructure Element: Green Streets

Downtown Street

Stormwater BMP Key

1. Rain Garden/Bioswale
2. Grass Swale
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Green Infrastructure Element: Green Streets

Community Street

Stormwater BMP Key
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Digital Version

- Visit the project website to view the full plan: http://www.passaiccountynj.org/government/departments/planning_and-economic-development/green-infrastructure.php
Haledon Avenue (Paterson)
Green Streets Pilot Project
Green Streets

- Green Street: “…a transportation corridor that incorporates low-impact design elements and promotes non-vehicular forms of transportation.”

A green street should:
- Reduce stormwater flow
- Improve water quality
- Reduce urban heating
- Enhance pedestrian safety
- Reduce carbon footprint
- Beautify neighborhoods
The Project

$330,572 in funding from NJDEP Nonpoint Source Pollutions Control Grants (319h) program

The Project Corridor: Haledon Avenue, Paterson
• Between E. Main Street and N. 2nd Street (roughly 1/5-mile)
• Stormwater flows to the Passaic River to the SE

The project entailed:
• Replacement of sidewalks, curbing, and ramps
• Installation of curb “bump outs” and high-visibility crosswalks
• Removal of unused/redundant curb cuts
• Addition of stormwater planters and rain garden
• Planting of shade trees, shrubs, and grass
The Corridor
Post-Construction/Planting
Next Steps

Implementing a monitoring plan to determine the effectiveness of the project
- Stormwater management: tracking the progress of the soil infiltration rate of stormwater
- Urban Heat Island effect: tracking air temperature
- Vehicular safety & traffic calming: Crash data and speed surveys

The County is working with community groups to coordinate on maintenance of plantings and pick-up of litter

Identifying additional projects as part of Green Stormwater Infrastructure Element implementation
- Lakeview Avenue, also in Paterson, is a priority project
- The County has formed a Green Stormwater Infrastructure Committee to identify opportunities to incorporate GSI into County facilities
- Green Streets practices will also be incorporated into future County resurfacing projects
Thank You!

Questions?

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