

REBUILD BY DESIGN **MEADOWLANDS**



FLOOD PROTECTION PROJECT

Boroughs of Little Ferry,
Moonachie, Carlstadt, and
Teterboro, and the Township
of South Hackensack in
Bergen County, New Jersey

September 20, 2016



PREPARED BY **AECOM**

CITIZEN ADVISORY GROUP (CAG) MEETING #4

CONCEPT COMPONENT DEVELOPMENT



Español 中文:繁體版 Việt-ngữ 한국어 Tagalog
Português العربية Kreyòl ગુજરાતી Italiano Polski
www.renewjerseystronger.org

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1.0 List of Acronyms and Glossary

List of Acronyms

BCR	Benefit/Cost Ratio
CAG	Citizen Advisory Group
CDBG-DR	Community Development Block Grant – Disaster Recovery
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
HUD	Department of Housing and Urban Development
NEPA	National Environmental Policy Act
NJDEP	New Jersey Department of Environmental Protection
RBD	Rebuild by Design
RBDM	Rebuild by Design Meadowlands

Glossary

Bioretention - is the process in which contaminants and sedimentation are removed from storm water runoff. Storm water is collected in treatment areas which often include landscape vegetation

Bioswale - a vegetated landscape swale that removes silt and pollution from surface runoff water, usually with gently sloped sides

Easement - the right to use and/or enter onto the property of another without possessing it

Encumbrance - an encumbrance is property which may be owned by one entity but other entities may have a right to or legal liability on the property

Filter strip - a flat vegetated area that removes pollutants from storm water as the storm water moves across as sheet flow. Filter strips are between 25 and 100 feet long

Fluvial Park - a public park with various ecosystems, especially related to wetlands and river ecosystems, with varying elevations and habitats. During a flood event the park can handle water inundation

Permeable Paving - a type of paving that allows rainwater to filter through the surface into a water catchment base, often created with interlocking paver tiles or a porous material surface

Public Realm - publicly owned streets, pathways, right of ways, parks, publicly accessible open spaces and any public and civic building and facilities

Rain Garden - a planted depression in a garden that absorbs rainwater runoff from impervious areas such as roofs, driveways, walkways, parking lots, and lawn areas

Runnel - a designed and landscaped channel that directs and assists the flow of rainwater

Widening Ditch – (3) Main ways to improve the ditches; daylighting and increasing habitat and vegetation, extending the ditch to connect to riparian corridor, and filling the ditch with aggregate, but expanding habitat above

2.0 Agenda

Design Concepts Work Session

6-8 Pm

September 20, 2016

Conference Room Location
Port Authority Conference Room
90 Moonachie Ave
Teterboro, NJ 07608

Welcome

Presentation (30 Minutes)

Opening Remarks (Linda Fisher, NJDEP)

Project Status Update (Christopher Benosky, AECOM)

Conceptual Design Considerations and Network Maps (Susan Bemis, AECOM)

Conceptual Design Kit of Parts for the (3) Alternatives (Structural Flood Reduction, Storm Water Drainage Improvements, and Hybrid).

Breakout Session (80 Minutes)

Alternative 1: Structural Flood Reduction (30 Minutes)

Alternative 2: Storm Water Drainage Improvements (30 Minutes)

Alternative 3: Hybrid (20 Minutes)

Next Steps & Q&A/Closure (10 Minutes)

Next Steps (Linda Fisher, NJDEP)


CAG Call to Action

Critical Schedule Dates

Question and Answers

3.0 Power Point Presentation

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CONCEPT COMPONENT DEVELOPMENT




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AGENDA

Linda Fisher, NJDEP

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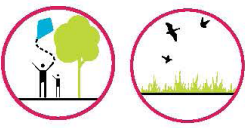
- Welcome & Opening Remarks

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PROJECT STATUS UPDATE

Chris Benosky, AECOM

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- Initial Screening Criteria - 35 comments from 5 reviewers received from our last meeting
- Completed and published to Project Website:
 - Final Public Scoping Document
 - Final Public Scoping Summary Report
 - Meeting Minutes from CAG Meeting #3
 - August 2016 Newsletter
- Developing the Preliminary Draft EIS
 - Conducting field work to support EIS and Feasibility Study
- Developing initial concepts *(with input from you tonight)*

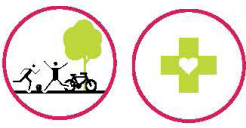
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MEETING OBJECTIVES

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Building the Concepts


- Design Elements: "Kit of Parts"
- Learn and Discuss Options via Breakout Sessions
- Provide Input into Concept Development



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ALTERNATIVES

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ALTERNATIVE 1

ALTERNATIVE 2

ALTERNATIVE 3


- Alternative 1: Structural Flood Reduction**
 - Alternative 1 is composed of various structural, infrastructure-based solutions that would be constructed to provide protection from both inland and tidal/storm surge flooding.
- Alternative 2: Storm Water Drainage Improvements**
 - Alternative 2 is composed of a series of storm water drainage projects aimed at reducing the occurrence of higher frequency, small- to medium-scale flooding events that impact the communities located in the Project Area.
- Alternative 3: Hybrid**
 - Alternative 3 is composed of a strategic, synergistic blend of new infrastructure and local drainage improvements to reduce flood risk in the Project Area.

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ABOUT THE PROCESS

Things to Keep in Mind

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- "Kit of Parts"**
 - Tool to Assist in the Development of Concepts
- Balance and Tradeoff**
 - The "Kit of Parts" strategies have a range of costs and a range of combinations
 - Where are we willing to compromise as a community?
 - What is most important?
- Different Options created to:**
 - Gauge Interest
 - Prioritize Location
 - Begin to Analyze and Balance Costs

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MEETING FORMAT

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- **Design Considerations – “Kit of Parts” Presentation** (15 Minutes)
- **Workshop Session** (90 Minutes):
 - **Alternative 1: Structural Flood Reduction** (30 Minutes)
 - Discussion of Concepts
 - Network Map Overlay + Zones
 - Network Map Trace Paper Overlay + Alignment Discussion
 - **Alternative 2: Storm Water Drainage Improvements** (30 Minutes)
 - Discussion of Concepts
 - Network Map + Zones
 - **Alternative 3: Hybrid** (20 Minutes)
 - Trace Paper Overlay + Discuss Priorities & Tradeoffs
 - **Handout & Next Steps** (10 Minutes)



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“KIT OF PARTS” - DESIGN CONSIDERATIONS

Susan Bemis, AECOM



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DESIGN CONSIDERATIONS - Overlays EASEMENTS & PUBLIC LAND

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- Legend**
- Watershed Boundaries
 - Water
 - Wetlands
 - Wetland Mitigation Banks
 - Public Land
 - Easements & Encumbrances



- Use publicly owned land (consider agency ownership) and right-of-way areas (public easements, encumbrances) to decrease cost.
- Understand the costs of land acquisition.



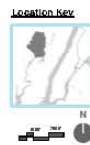
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DESIGN CONSIDERATIONS - Overlays EVACUATION ROUTES & ZONING

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- Legend**
- Watershed Boundaries
 - Water
 - Wetlands
 - Wetland Mitigation Banks
 - Evacuation Routes
 - Residential
 - Commercial
 - Light Industrial



- Improve evacuation route durability in a storm event.
- Focus on residential areas, protect all residents.
- Focus on cost-effective alternatives for industrial edges.



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DESIGN CONSIDERATIONS - Overlays PROJECT AREA HIGH POINTS

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- Legend**
- Above 10'
 - 9'
 - 8'
 - 7'
 - 6'
 - Below 6'



- Connect to elevation high points (reduce length/cost of structural protection) and substantial existing structures for tie backs and anchors.
- Focus on areas within the 100-year flood zone.



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DESIGN CONSIDERATIONS - Overlays DITCHES & LEGACY BERMS

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- Legend**
- Water
 - Wetlands
 - Wetland Mitigation Banks
 - Legacy Berms
 - Ditches
 - Sub-basin Boundary



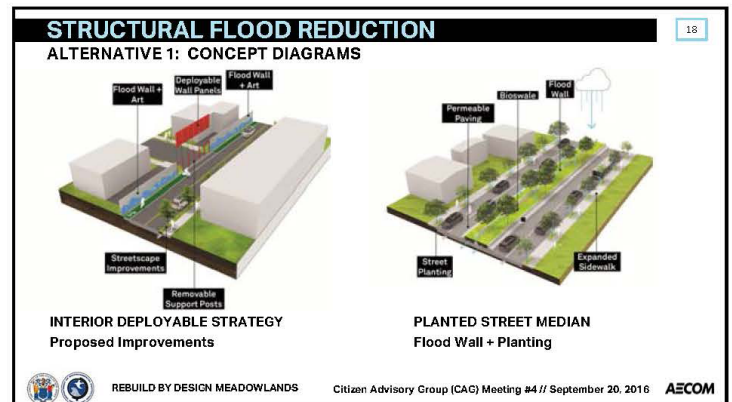
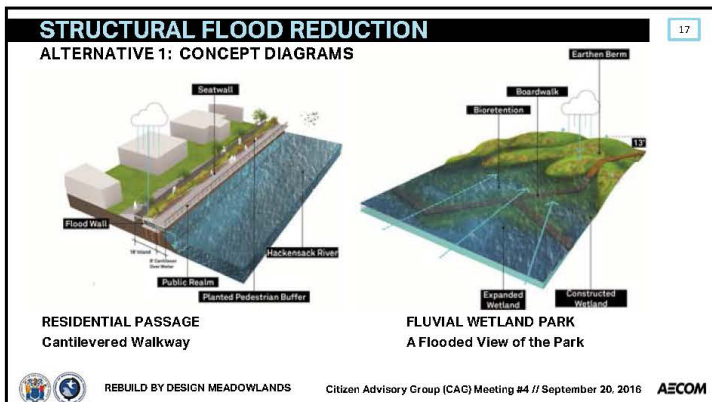
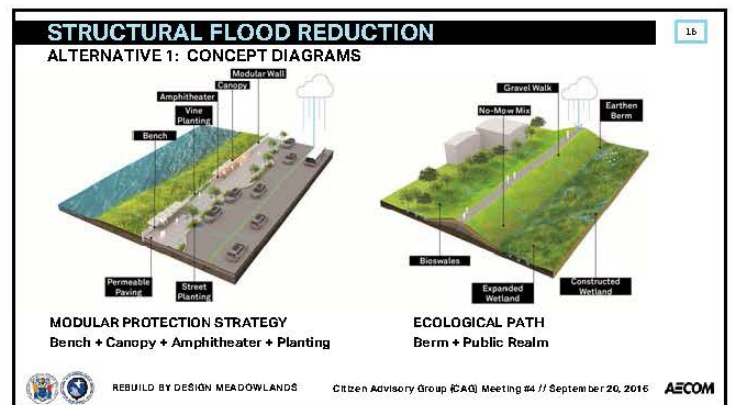
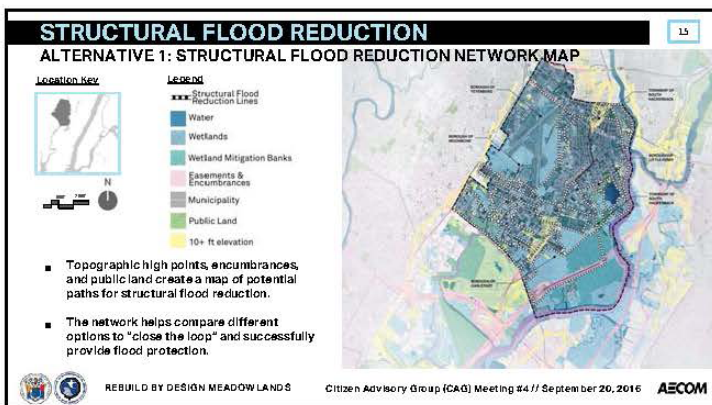
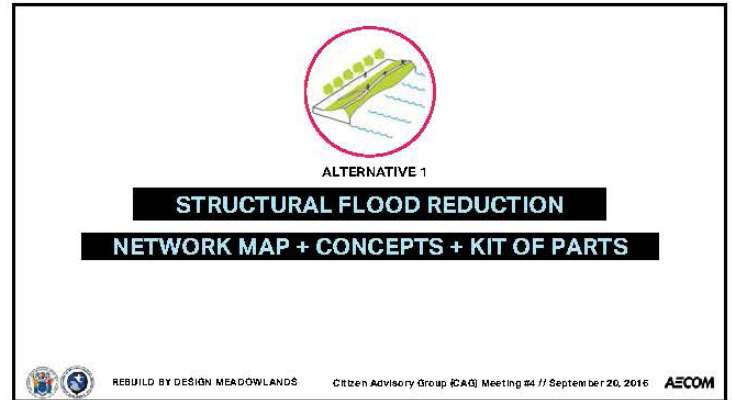
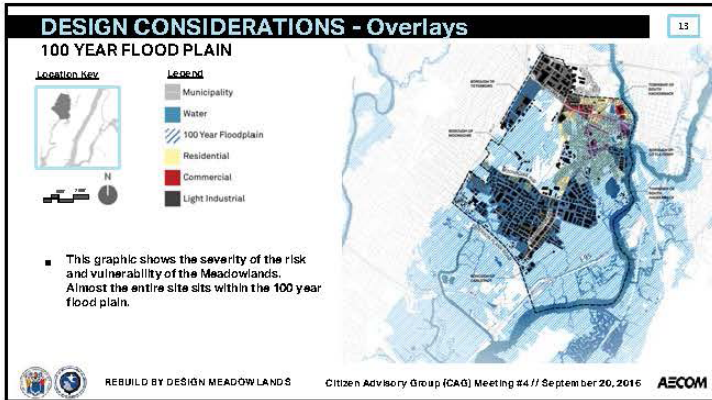
- Consider connecting water systems.
- Potential to enhance and connect to existing legacy berms and ditches.
- Provide connection and waterfront access.



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STRUCTURAL FLOOD REDUCTION
ALTERNATIVE 1: KIT OF PARTS

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BASIC FLOOD WALL





SHEET PILE

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STRUCTURAL FLOOD REDUCTION
ALTERNATIVE 1: KIT OF PARTS

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VINE PLANTING








BENCH




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STRUCTURAL FLOOD REDUCTION
ALTERNATIVE 1: KIT OF PARTS

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PLANTER

CANOPY

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STRUCTURAL FLOOD REDUCTION
ALTERNATIVE 1: KIT OF PARTS

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ART





AMPHITHEATER

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STRUCTURAL FLOOD REDUCTION
ALTERNATIVE 1: KIT OF PARTS

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BERM + PATH





BERM + WALL

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STRUCTURAL FLOOD REDUCTION
ALTERNATIVE 1: KIT OF PARTS

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CANTILEVERED WALKWAY





FLIP DEPOLYABLE

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STRUCTURAL FLOOD REDUCTION

ALTERNATIVE 1: KIT OF PARTS

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PANEL DEPOLYABLE

INFLATABLE DEPLOYABLE

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ALTERNATIVE 2

STORM WATER DRAINAGE IMPROVEMENTS

NETWORK MAP + CONCEPTS + KIT OF PARTS

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STORM WATER DRAINAGE IMPROVEMENTS

ALTERNATIVE 2: STORM WATER DRAINAGE IMPROVEMENTS ZONE MAP

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Location Key

Legend

- Watershed Boundaries
- Ditches
- Water
- Wetlands
- Wetland Mitigation Banks
- Sub-basin Boundaries
- Evacuation Routes
- Easements & Encroachments
- Municipality
- Residential
- Commercial
- Light Industrial
- Public Land

- Topographic edges & watersheds define natural catchment basins.
- Transit edges help define roadway connectors with green infrastructure.
- Zoning edges, especially industrial, residential, and commercial help define areas of focus.

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STORM WATER DRAINAGE IMPROVEMENTS

ALTERNATIVE 2: CONCEPT DIAGRAMS

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OPEN SPACE
Managing Water + Providing Open Space

STREET IMPROVEMENTS
Walkable Streets + Bike Lanes

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STORM WATER DRAINAGE IMPROVEMENTS

ALTERNATIVE 2: CONCEPT DIAGRAMS

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STREET IMPROVEMENTS
Bike Lanes + Bioswales

STREET IMPROVEMENTS
Permeable Paving + Runnel + Street Trees

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STORM WATER DRAINAGE IMPROVEMENTS

ALTERNATIVE 2: CONCEPT DIAGRAMS

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REVIVING THE DITCH
Option 1: Extend the Riparian Corridor


REVIVING THE DITCH
Option 2: Daylight and Enhance the Ditch

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STORM WATER DRAINAGE IMPROVEMENTS

ALTERNATIVE 2: KIT OF PARTS

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SUBSURFACE INFRASTRUCTURE

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STORM WATER DRAINAGE IMPROVEMENTS

ALTERNATIVE 2: KIT OF PARTS

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OPEN SPACE




WETLAND ENHANCEMENT/CREATION



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STORM WATER DRAINAGE IMPROVEMENTS

ALTERNATIVE 2: KIT OF PARTS

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BIOSWALE




RUNNEL



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STORM WATER DRAINAGE IMPROVEMENTS

ALTERNATIVE 2: KIT OF PARTS

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BIORETENTION




RAIN GARDEN



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STORM WATER DRAINAGE IMPROVEMENTS

ALTERNATIVE 2: KIT OF PARTS

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FILTER STRIP




BIKEABLE STREETS



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STORM WATER DRAINAGE IMPROVEMENTS

ALTERNATIVE 2: KIT OF PARTS

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PERMEABLE PAVING





WIDENING DITCHES



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ALTERNATIVE 3
HYBRID



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HYBRID

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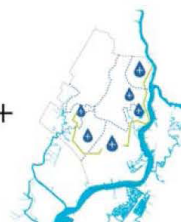
ALTERNATIVE 3: PRIORITIES AND TRADEOFFS



→




+



Several Options for Protection


Consider Protected Areas

Identify Storm Water Improvement Areas



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HYBRID

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ALTERNATIVE 3: PRIORITIES AND TRADEOFFS



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Alternative 1:
Structural Flood Reduction

Alternative 2:
Storm Water Drainage Improvements

Alternative 3:
HYBRID

*Priorities and tradeoffs will be discussed in groups




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BREAKOUT SESSION & NEXT STEPS



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AGENDA

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BREAKOUT SESSION & NEXT STEPS




- **Alternative 1: Structural Flood Reduction** (30 Minutes)
 - Discussion of Concepts
 - Network Map Overlay + Zones
 - Network Map Trace Paper Overlay + Alignment Discussion
- **Alternative 2: Storm Water Drainage Improvements** (30 Minutes)
 - Discussion of Concepts
 - Network Map + Zones
- **Alternative 3: Hybrid** (20 Minutes)
 - Trace Paper Overlay + Discuss Priorities & Tradeoffs
- **Handout & Next Steps** (10 Minutes)



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NEXT STEPS

Chris Benosky, AECOM

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Moving from "Kit of Parts" to Concepts

- Verbal Community Feedback (from Tonight's Groups)
- Written Community Feedback (In Handout)
- Analyzing Community Feedback
- Developing Concepts



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NEXT STEPS

Linda Fisher, NJDEP

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NJDEP / AECOM upcoming activities:

- Prepare Meeting Summary for this meeting
- Continue developing:
- Initial Alternatives and Concepts
- Preliminary Draft EIS
- Update and refine Initial Screening Criteria Matrix



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NEXT STEPS

CAG: CALL TO ACTION

- Submit comments by **September 30, 2016** on Concept Handout
- Review and comment on Meeting Summary for this meeting
- Share information from this Meeting with friends and neighbors
- Educate your friends and colleagues on the project and NEPA process
- Continue to build interest in the Project
- Continue obtaining information, ideas, and potential concerns from constituents
- Ensure the public knows about upcoming information (to be posted on Project website)



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NEXT STEPS

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Critical Schedule Dates (approximate):

Monday, October 24

CAG Meeting #5: Initial Concept Alternatives



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THANK YOU!



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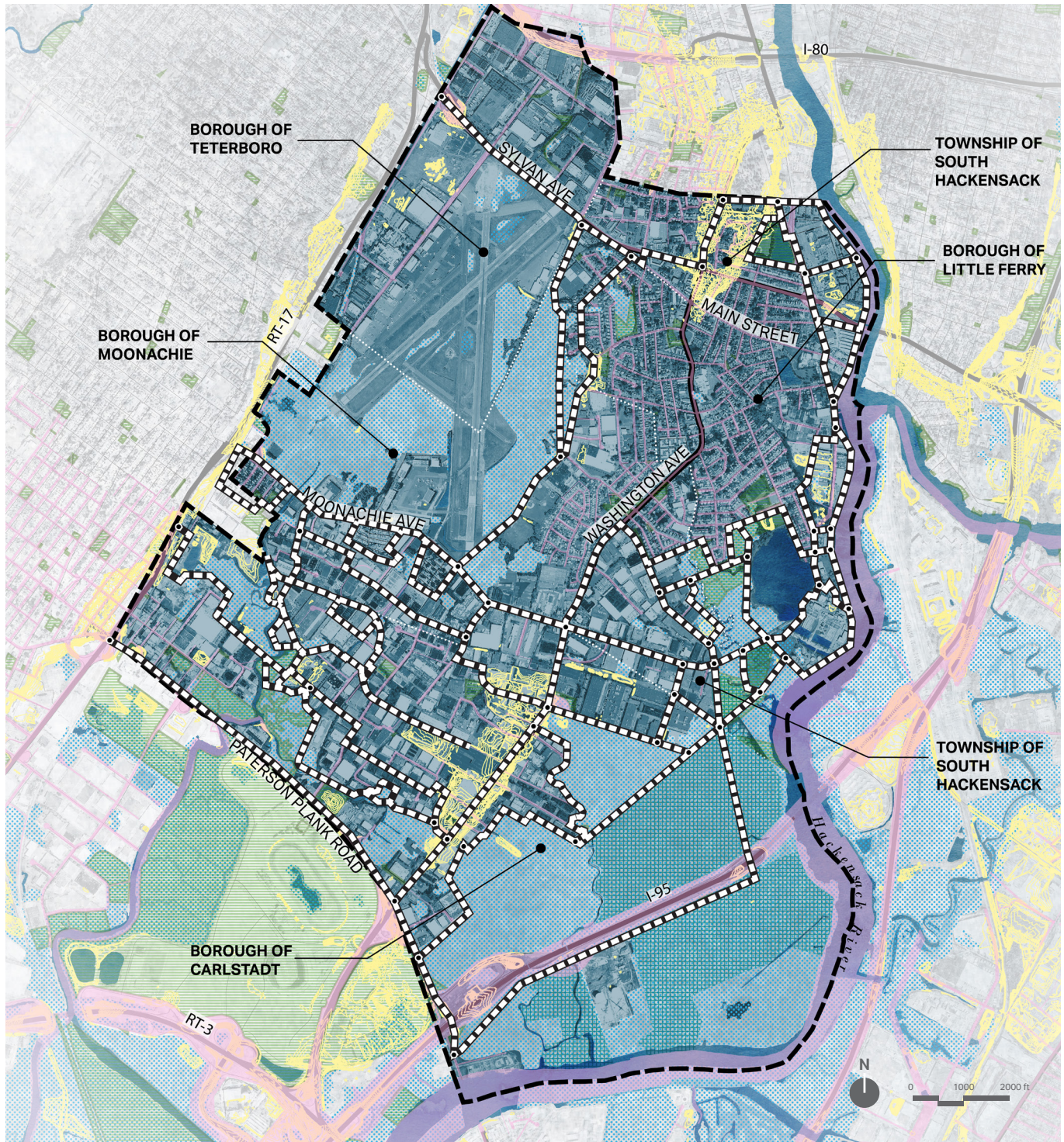
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4.0 Boards

ALTERNATIVE 1: NETWORK ANALYSIS STRUCTURAL FLOOD REDUCTION

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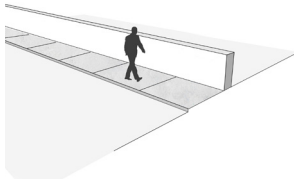
- Structural Flood Reduction Lines
- Water
- Wetlands
- Wetland Mitigation Banks
- Easements & Encumbrances
- Public Land
- Municipality
- 10+ ft elevation

ALTERNATIVE 1: KIT OF PARTS STRUCTURAL FLOOD REDUCTION

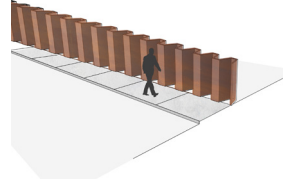
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BASIC FLOOD WALL



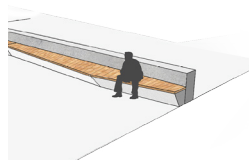
SHEET PILE



VINE PLANTING



BENCH



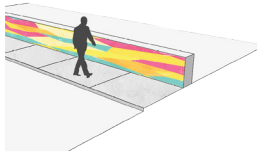
PLANTER



CANOPY



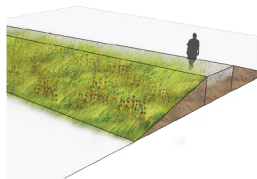
ART



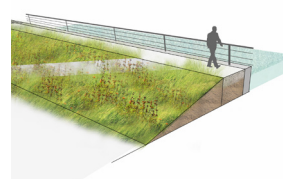
AMPHITHEATER



BERM + PATH



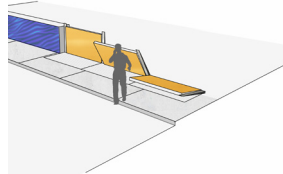
BERM + WALL



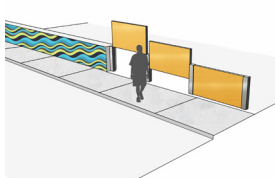
CANTILEVERED WALKWAY



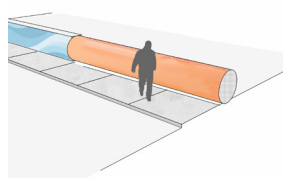
FLIP DEPLOYABLE



PANEL DEPLOYABLE



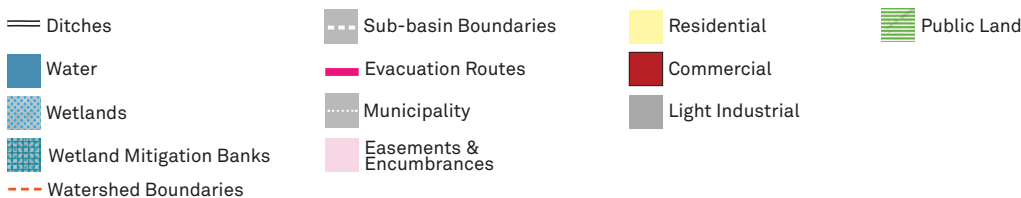
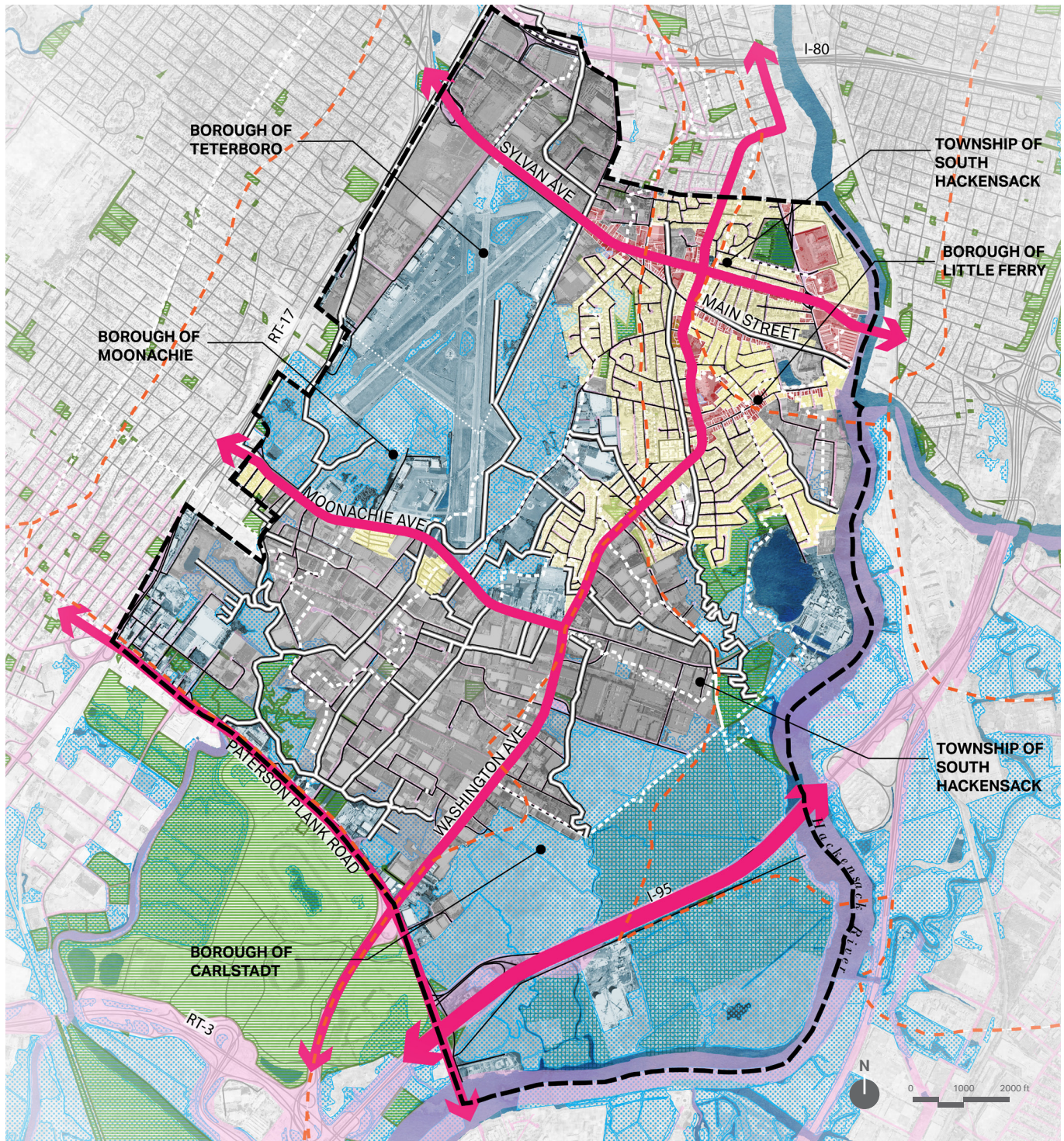
INFLATABLE DEPLOYABLE



ALTERNATIVE 2: NETWORK ANALYSIS STORM WATER DRAINAGE IMPROVEMENTS

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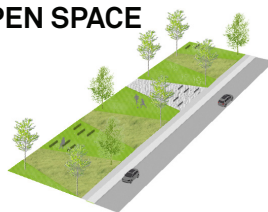
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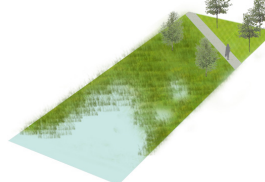
ALTERNATIVE 2: KIT OF PARTS STORM WATER DRAINAGE IMPROVEMENTS

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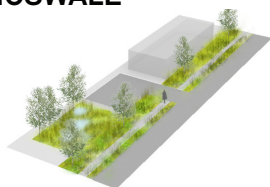
OPEN SPACE



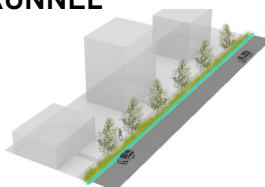
WETLAND ENHANCEMENT/CREATION



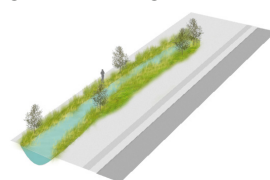
BIOSWALE



RUNNEL



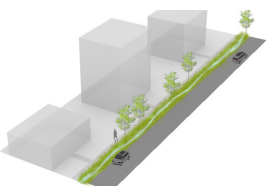
BIORETENTION



RAIN GARDEN



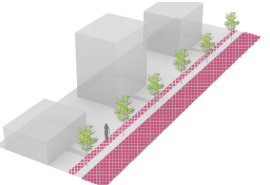
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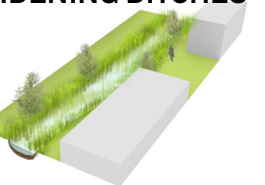
BIKEABLE STREETS



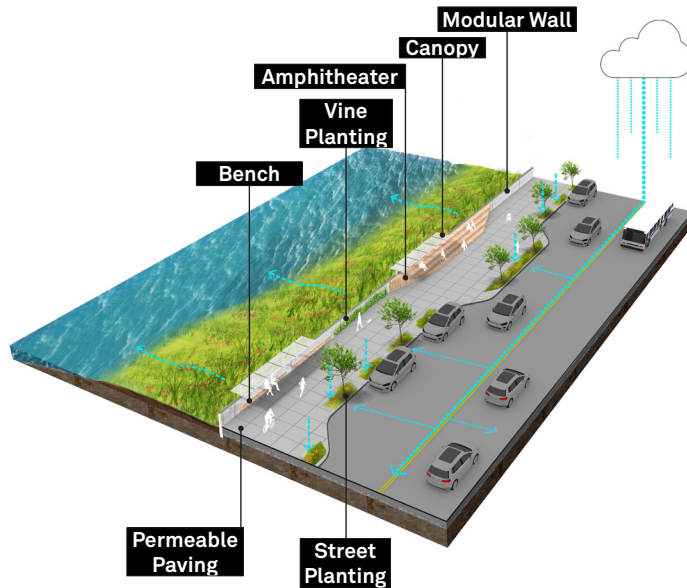
PERMEABLE PAVING



WIDENING DITCHES



5.0 Concept Worksheets



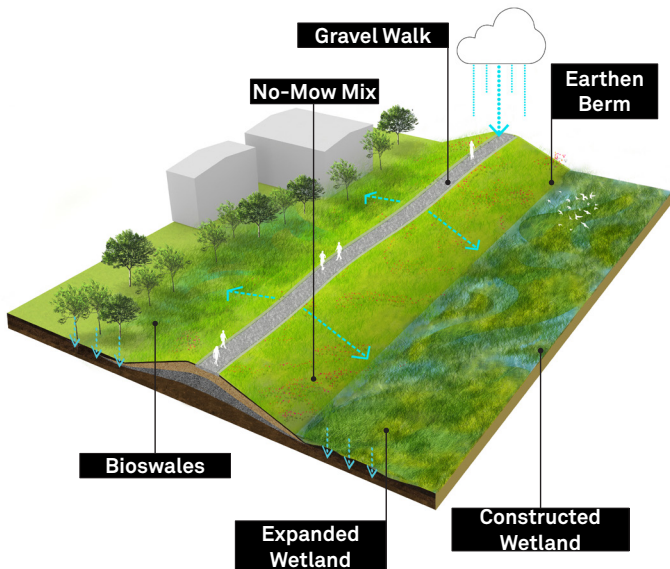
MODULAR PROTECTION STRATEGY

BENCH + CANOPY + AMPHITHEATER + PLANTING

Likes:

Dislikes:

Additional ideas:



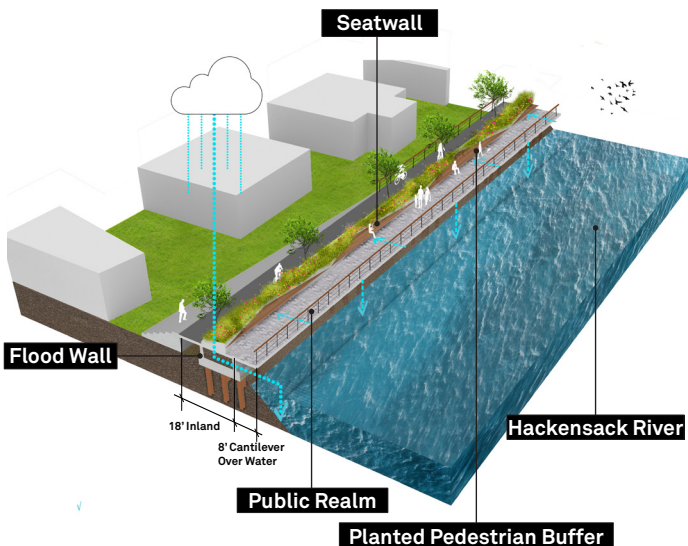
ECOLOGICAL PATH

BERM + PUBLIC REALM

Likes:

Dislikes:

Additional ideas:



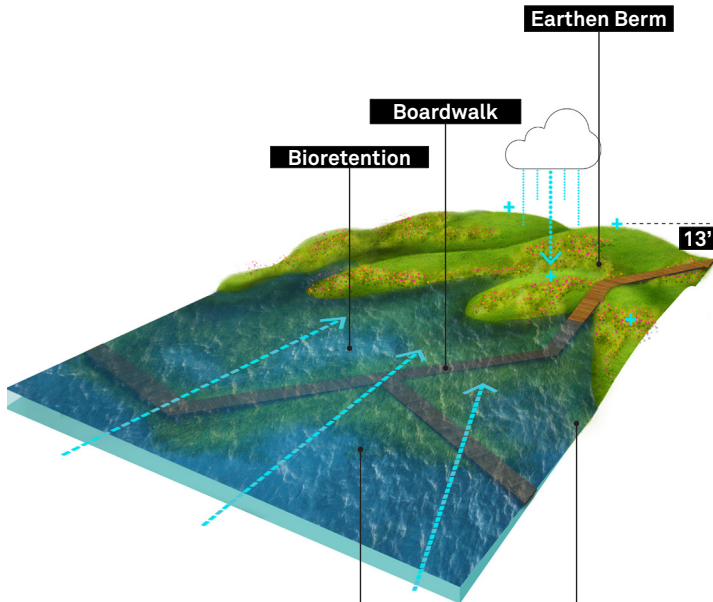
RESIDENTIAL PASSAGE

CANTILEVERED WALKWAY

Likes:

Dislikes:

Additional ideas:



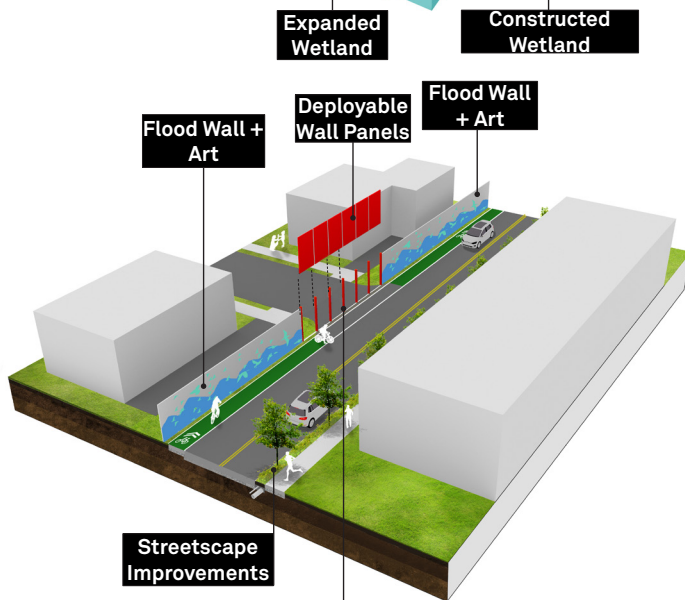
FLUVIAL WETLAND PARK

FLOODED VIEW OF PARK

Likes:

Dislikes:

Additional ideas:



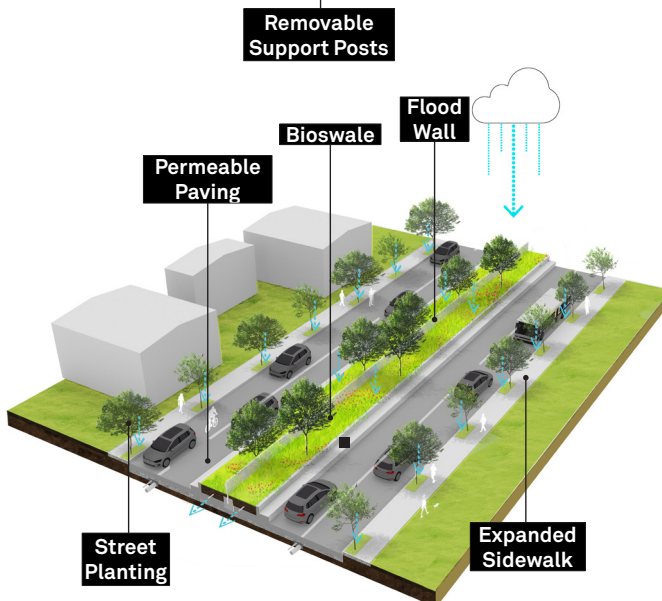
INTERIOR DEPLOYABLE STRATEGY

PROPOSED IMPROVEMENTS

Likes:

Dislikes:

Additional ideas:



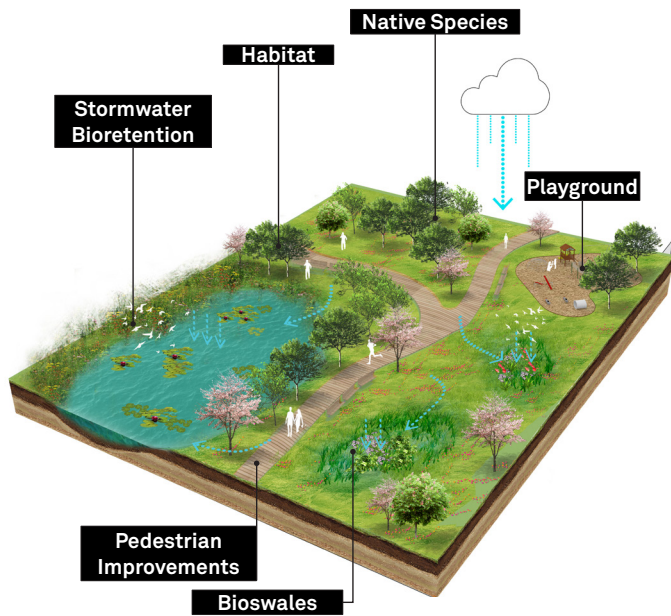
PLANTED STREET MEDIAN

FLOOD WALL + PLANTING

Likes:

Dislikes:

Additional ideas:



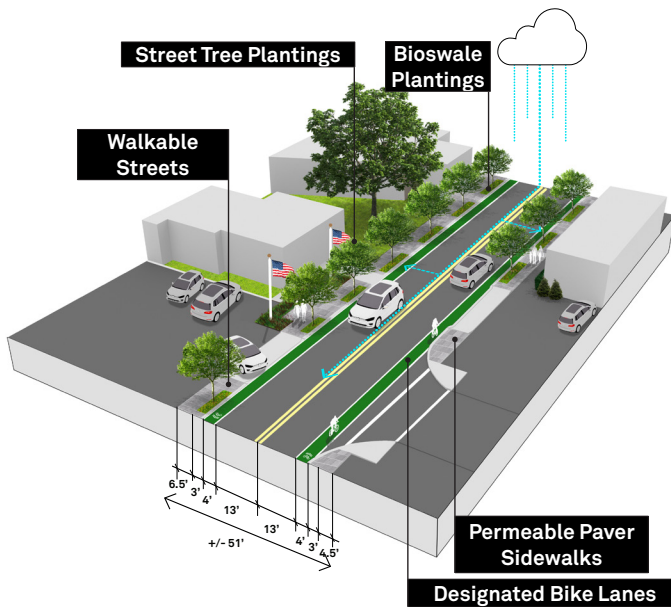
OPEN SPACE

MANAGING WATER + PROVIDING PUBLIC OPEN SPACE

Likes:

Dislikes:

Additional ideas:



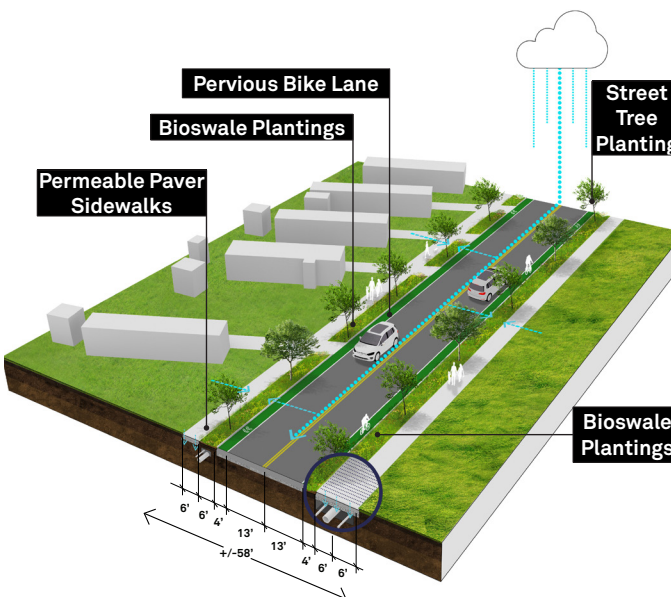
STREET IMPROVEMENTS

WALKABLE STREETS + BIKE LANES

Likes:

Dislikes:

Additional ideas:



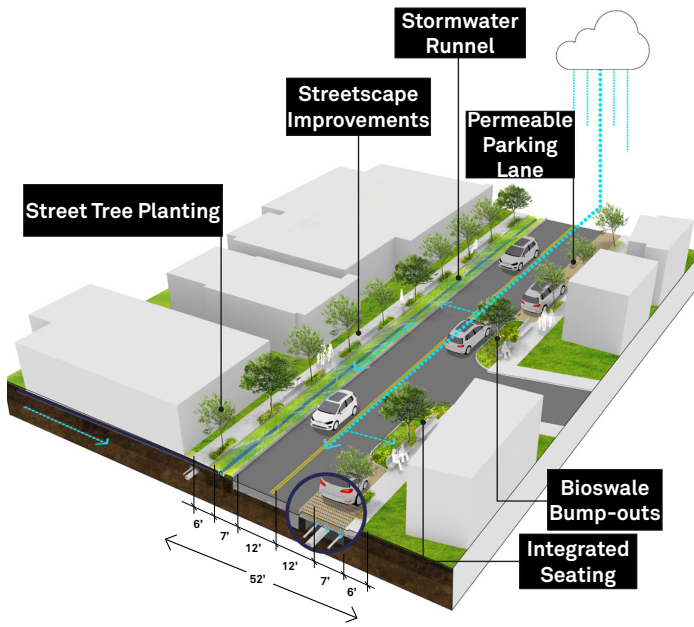
STREET IMPROVEMENTS

BIKE LANES + BIOSWALES

Likes:

Dislikes:

Additional ideas:



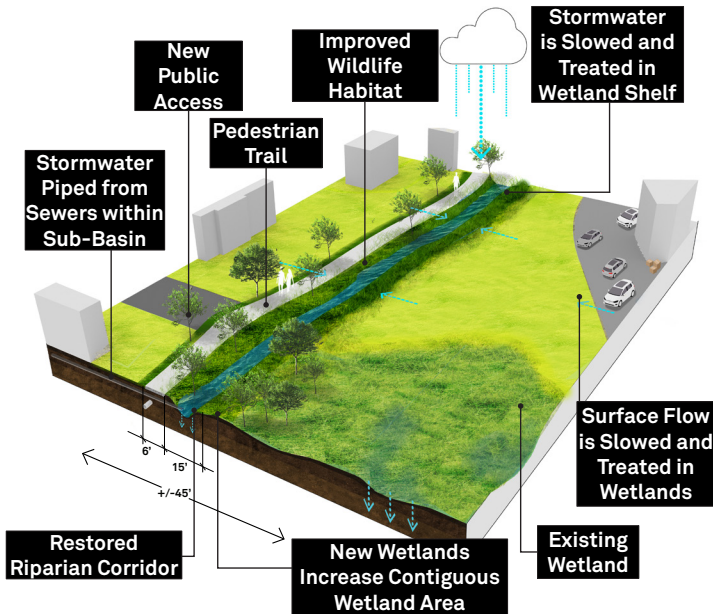
STREET IMPROVEMENTS

PERMEABLE PAVING + RUNNELS + STREET TREES

Likes:

Dislikes:

Additional ideas:



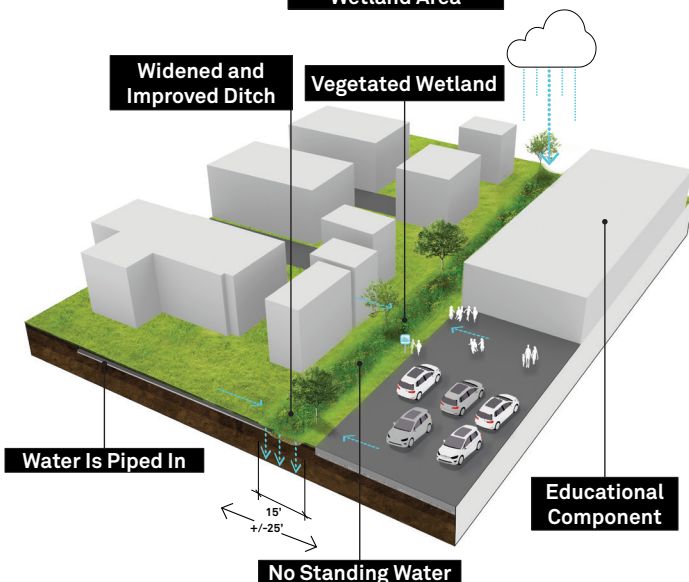
REVIVING THE DITCH

OPTION 1: EXTEND THE RIPARIAN CORRIDOR

Likes:

Dislikes:

Additional ideas:



REVIVING THE DITCH

OPTION 2: DAYLIGHT + ENHANCE THE DITCH

Likes:

Dislikes:

Additional ideas:



6.0 Personal Notes

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

[illegible]