Subject	**Meeting Minutes - Citizen Advisory Group (CAG) Meeting #4**
Meeting Date	**September 20, 2016**
Time	**6:00 pm – 8:00 pm ET**
Location	**Port Authority Conference Room, 90 Moonachie Ave, Teterboro, NJ 07608**
Attendees	**Attendee list available, *for internal use only***

- The PowerPoint slide presentation utilized at the meeting is attached to the meeting minutes (see **Attachment 1**).
- A CAG meeting packet was provided to all attendees and is also attached to the meeting minutes (see **Attachment 2**).
- Introductions – Linda Fisher, NJDEP Rebuild By Design (RBD) Meadowlands Project Team Manager, opened the meeting by providing a brief overview of the meeting objectives, which included: (1) a Project status update, (2) a presentation describing the design considerations that went into the development of the "Kit of Parts," and (3) an interactive "Kit of Parts" workshop session.
- Chris Benosky, AECOM RBD Program Manager, provided the Project status update. The NJDEP received 35 comments from 5 reviewers on the Initial Screening Criteria matrix provided at the last CAG meeting; these comments are being used to further refine the matrix. Several documents are available on the website, including the Final Public Scoping Document, Final Public Scoping Summary Report, August Newsletter, and CAG #3 Meeting Minutes. Several teams began conducting field work in August for the Environmental Impact Statement (EIS) and Feasibility Study. Field crews will continue to be in and around the Project Area for next several months.
- Finally, Mr. Benosky introduced tonight's main objective, which will include an overview of how initial concepts are being developed and how the CAG can assist the NJDEP Project Team tonight by providing initial input on these concepts. Specific locations are not being shown tonight for these concepts. We are looking for your input during the workshop session to help us prioritize concepts with the overall goal to balance costs and identify a holistic solution.
- Susan Bemis, AECOM Senior Planner, presented an overview of the key considerations that went into identifying the initial design components for the three Build Alternatives, which include Alternative 1 (Structural Flood Reduction), Alternative 2 (Storm Water Drainage Improvements), and Alternative 3 (Hybrid of Alternatives 1 and 2). Several geographic areas and features within the Project Area were examined during the design process including, but not limited to, existing land use, ownership, zoning, evacuation routes, topographic high points, legacy berms and ditches, and the 100-year floodplain. To

minimize land acquisition and other project-related costs, the use of publicly owned land and easements and existing natural topographic "high points" and legacy berms/ditches is being explored.

- **Alternative 1 – Structural Flood Reduction**: As an initial step, a network map of potential lines of protection was developed using the preliminary data gathered for topographic high points, encumbrances, and public land. This network includes several options; however, the lines of protection options must form a closed loop to ensure flood protection. Options that do not connect to natural topographic high points and form a closed loop are not feasible protection alternatives. Potential flood protection concept drawings were presented to introduce the various "Kit of Parts" for Alternative 1, which included a basic floodwall and sheet pile design, visually enhanced or multi-functional flood walls (e.g., walkways, benches, plantings), berms, and deployable flood wall concepts. Examples of each of these concepts, previously implemented in other towns/cities, were provided.

- **Alternative 2 – Storm Water Drainage Improvements**: As an initial step, the Project Area was divided into key zones based on topography and watersheds, roadways, and zoning/land use to help focus concept development within the Project Area. The focus for Alternative 2 tonight will be on the green infrastructure components of this alternative rather than the gray infrastructure components, which we have discussed previously and will continue to discuss at future meetings. Potential flood protection concept drawings were presented to introduce the various "Kit of Parts" for Alternative 2, which included various green infrastructure concepts such as open space, bioswales, permeable paving, wetland enhancement/creation, and others. Examples of each of these concepts, previously implemented in other towns/cities, were provided.

- **Alternative 3 – Hybrid**: As part of the development of this alternative, we need to identify the key priorities identified within Alternatives 1 and 2, and identify the tradeoffs of not implementing certain components of each alternative in developing Alternative 3. This assessment will need to take into consideration the various protection options, the areas to be protected, and what areas are in need of storm water improvements within the budgetary constraints.

- CAG members questioned how they could identify locations for these concepts when they do not know where the easements and other features are located. The NJDEP Project Team is locating all easement / right-of-way information and documenting the locations of existing berms, tide gates, pump stations, etc. The goal of tonight's meeting is to get input from the CAG on what types of flood control measures the CAG thinks we should prioritize. The NJDEP Project Team wants to get a better idea on the CAG's likes and dislikes with regard to these initial concepts and components.

- Upon completion of the presentation, the "Kit of Parts" workshop session was initiated. Meeting attendees were broken into three tables for discussion. Each table had a Facilitator and Note Taker from the Project Team along with network maps, poster boards, trace paper, markers, stickers, and other

items to facilitate the group discussion. The intent of this exercise was to talk about priorities for types of structural flood protection measures for the three alternatives. The session was organized as follows: 30 minutes for Alternative 1 (Structural Flood Reduction), 30 minutes for Alternative 2 (Storm Water Drainage Improvements), and 20 minutes for Alternative 3 (Hybrid).

- The NJDEP Project Team Facilitators described the Network and Zone Maps, and the various protection strategies within the "Kit of Parts" in greater detail. The Project Area was divided for discussion purposes into 5 distinct zones: Berry's Creek Zone, Interior Community & Airport Zone, Northeast Residential Zone, Industrial Wetland Zone, and Wetland Zone. These zones were also used to help attendees prioritize specific flood control measures that they deemed more or less appropriate within specific locations in the Project Area.

- Overall input received from the "Kit of Parts" workshop session centered on the following topics: the protection of wetlands and biological resources; cost-benefit analyses; real estate and land acquisition implications; waterfront access along the Hackensack River; and the identification of and improvements to existing flood control infrastructure.

- The need for maintaining these flood control measures was a concern at multiple tables, along with the need to identify the responsible entity for ensuring they are maintained over the long term.

- The constant and repeated flooding after rain events in the Project Area was identified as a greater concern, while flooding from storm surges rarely happens.

- When identifying priorities, CAG members emphasized the need for the Proposed Project to utilize the cheapest and quickest options to alleviate and manage the 100-year floodplain. Future projects can focus more on improving parks and other aesthetics. When balancing project costs and resources, amenities (if costly) should come secondary to increased flood protection. In addition, the Proposed Project's alternatives should not induce flooding to surrounding areas outside the Project Area, and should benefit as many people as possible. Further, opportunities for owner buyout and private land acquisition should be discussed and considered during the alternative development process.

- Specific input during the breakout session for each of the three Build Alternatives from CAG members is provided below.

- **<u>Alternative 1 – Structural Flood Reduction</u>**
    - Access to the Hackensack River waterfront needs to remain a priority. Prior to any construction, the topography of the area must be analyzed. In addition, wetlands and biological resources need to be protected during and after construction of the Proposed Project. Soft berms, instead

of hard edges along the river, should be considered to allow for the reestablishment of natural vegetative communities in these areas after construction.

- Sheet pile could be used for both flood protection and to dike specific areas along the southern portion of the Project Area (north-side of the wetland zone) to create additional wetland areas to the west of the mitigation banks. The use of sheet pile would help minimize environmental impacts due to its narrower ecological footprint. If the area adjacent to the west of the mitigation banks was diked, three types of wetland areas could be created: forested, meadows, and a freshwater impoundment. This would, in turn, provide additional flood storage, as well as low-cost amenities. The area immediately north of the wetland zone could also be a good location for recreational paths.
- In general, maintenance was a concern with regard to deployable options. As such, flip deployables were identified as preferred because they require less maintenance than inflatables. Inflatables are very heavy and will need to be transported with heavy equipment. Flip deployables at marinas and boat ramps would need regular inspections and maintenance, but they would require less manpower than other options.
- The idea of adding a tide gate along Paterson Plank Road in the Berry's Creek Zone (instead of a structural flood wall in this zone) was suggested to stop water from coming into the Project Area. The tide gate could be closed during storm events.
- While flood protection is the main objective and amenities should come as a secondary element due to limited resources, the project may be able to accomplish both, as amenities are not always costly.

- **<u>Alternative 2 – Storm Water Drainage Improvements</u>**
  - Further research into rain gardens, rain barrels, and other green infrastructure should be considered to prevent water from reaching tide gates. The East and West Riser tide gates control water all the way to Interstate 80.
  - Additional pump stations and detention basins would also need to be constructed to control water within the municipalities of the Project Area.
  - Ditch improvements and connections, along with green infrastructure initiatives, were emphasized to prevent overflow of flood waters onto residential properties. Current ditch elevations vary and can obstruct flow. There is also an ongoing County program targeted at backflow prevention on State Street.
  - Green infrastructure maintenance and responsibility for maintenance is a concern, as well as maintenance of existing infrastructure over the long term.

- The Port Authority's plans at Teterboro Airport would require mitigation and should be considered as an opportunity for green infrastructure.
- The construction of bioswales was well received by CAG members. One group suggested the use of bioswales south and east of the Teterboro Airport to provide a buffer between the airport and communities. Reference the Rutgers Moonachie study on locations for rain gardens, rain barrels, etc.
- The opportunity for street improvements along Washington Ave is limited particularly from Route 46 to Graycliff in Moonachie because there is only one lane and very little space between the road and sidewalk. However, there is more room on the southern end of the Project Area from Graycliff to Patterson Plank, which is a 2-lane road. In general, streets with bike paths were not identified as a high priority. West Commercial Avenue floods during rainfall events and could be considered for green infrastructure street improvements. Road easements should be used for green infrastructure.
- Enhancing open spaces was discussed. Teterboro Airport is not accessible as an open space area, and Teterboro forest is already a palustrine forested wetland that is habitat for many migratory birds. Losen Slote is a great migratory bird area that would benefit from some enhancements, such as widening. Work is currently underway at Indian Lake to construct ball fields. Soil was removed from this area and placed at Willow Lake (which has historically been an uncontrolled dump). Artificial turf is being placed at Indian Lake.

- **Alternative 3 – Hybrid**
  - CAG members emphasized the utilization of green and gray infrastructure together to benefit the Project Area.
  - Development has occurred throughout the Project Area and has displaced natural habitats; therefore, improvements should not be used to generate or promote additional development.
  - Having green infrastructure above ground was identified as a potential benefit because of the potential for underground pipes, outfalls, and catch basins to undergo post-construction modifications.
  - Pollution issues associated with Berry's Creek are of a concern and should be taken into consideration.
  - Further research should be conducted that reviews flood prevention measures implemented in European locations and ways to return developed areas to their natural systems.
- Chris Benosky, AECOM RBD Program Manager, closed the meeting. The NJDEP Project Team will be taking the CAG's verbal feedback from tonight's meeting into consideration as we develop concepts further. In addition, we welcome any further feedback on the initial concepts presented and discussed

tonight until **Friday, September 30th**. We have included worksheets for the CAG to provide additional input on their likes, dislikes, and any additional ideas on the various components and concepts. You are welcome to use these worksheets or just provide general comments via email. All worksheets and comments should be directed to the project email address: rbd-meadowlands@dep.nj.gov. Feedback received will be analyzed and utilized during concept development.

- The next CAG meeting will be on Tuesday, October 24th at One Bergen County Plaza.

Meeting adjourned at 9:10 pm ET.

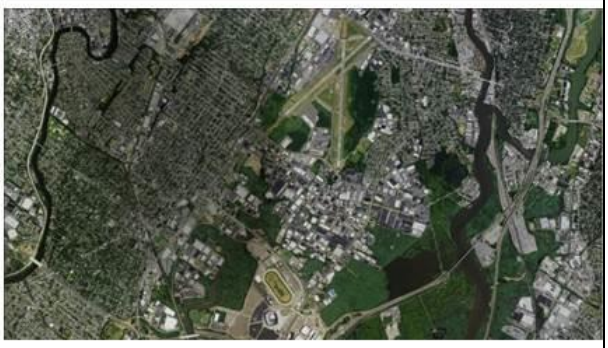
Attachment 1. Power Point Slide Presentation (as delivered)

REBUILD BY DESIGN

MEADOWLANDS

CITIZEN ADVISORY GROUP (CAG) MEETING #4

CONCEPT COMPONENT DEVELOPMENT



FLOOD PROTECTION PROJECT

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

AGENDA

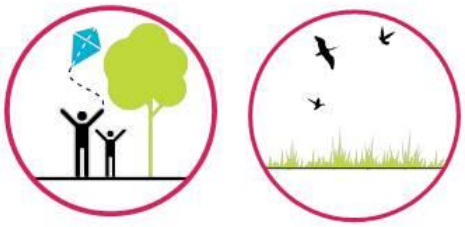
Linda Fisher, NJDEP

- Welcome & Opening Remarks

PROJECT STATUS UPDATE

Chris Benosky, AECOM

3



- 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!*)

MEETING OBJECTIVES

4

Building the Concepts

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

ALTERNATIVES

5

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.

ABOUT THE PROCESS

6

Things to Keep in Mind

- **"Kit of Parts"**
  - Tool to Assist in the Development of Concepts
- **Balance and Tradeoff**
  - The "Kit of Part" 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

MEETING FORMAT

7

- **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)

"KIT OF PARTS" - DESIGN CONSIDERATIONS

Susan Bemis, AECOM

DESIGN CONSIDERATIONS - Overlays

9

EASEMENTS & PUBLIC LAND

Location Key

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.

DESIGN CONSIDERATIONS - Overlays

10

EVACUATION ROUTES & ZONING

Location Key

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.

DESIGN CONSIDERATIONS - Overlays

11

PROJECT AREA HIGH POINTS

Location Key

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.

DESIGN CONSIDERATIONS – Overlays

12

DITCHES & LEGACY BERMS

Location Key

Legend

- Water
- Wetlands
- Wetland Mitigation Banks
- Legacy Berms
- Ditches
- Sub-basin Boundry

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

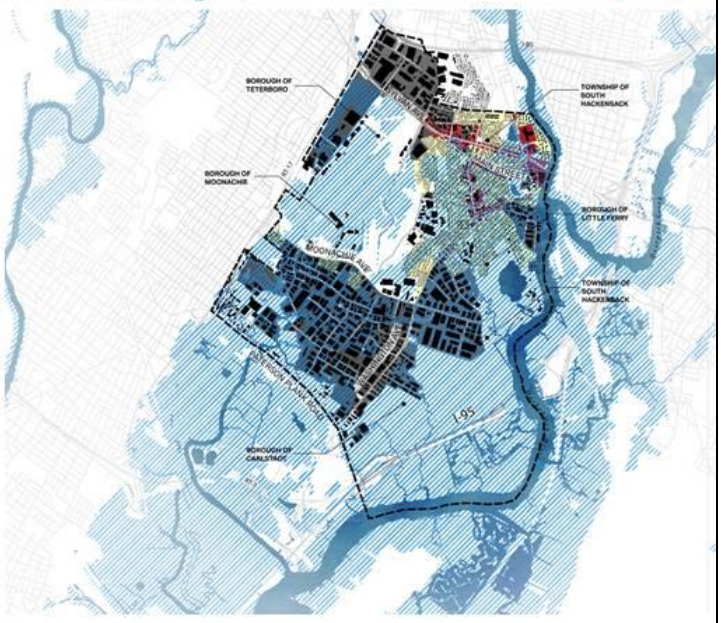
DESIGN CONSIDERATIONS - Overlays

100 YEAR FLOOD PLAIN

Location Key

Legend

- Municipality
- Water
- 100 Year Floodplain
- Residential
- Commercial
- Light Industrial



- This graphic shows the severity of the risk and vulnerability of the Meadowlands. Almost the entire site sits within the 100 year flood plain.

ALTERNATIVE 1

STRUCTURAL FLOOD REDUCTION

NETWORK MAP + CONCEPTS + KIT OF PARTS

STRUCTURAL FLOOD REDUCTION

15

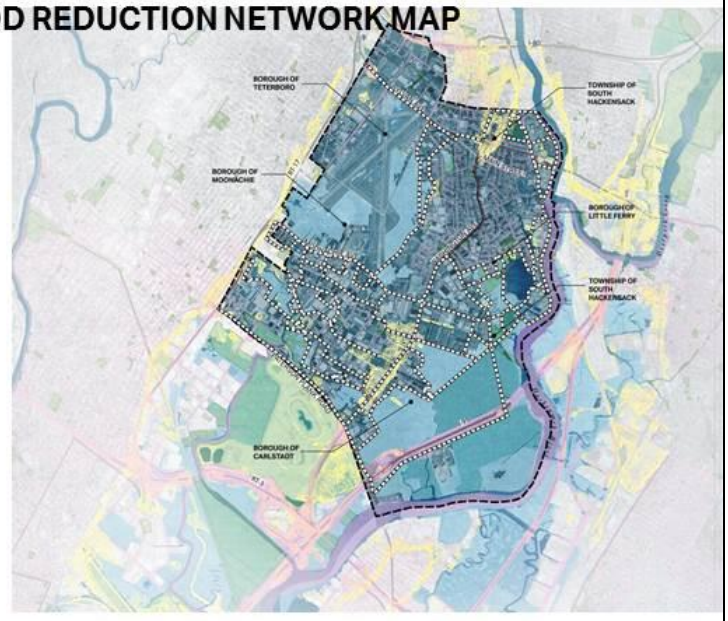
ALTERNATIVE 1: STRUCTURAL FLOOD REDUCTION NETWORK MAP

Location Key

N

Legend

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



- **Topographic high points, encumbrances, and public land create a map of potential paths for structural flood reduction.**
- **The network helps compare different options to "close the loop" and successfully provide flood protection.**

STRUCTURAL FLOOD REDUCTION

16

ALTERNATIVE 1: CONCEPT DIAGRAMS

MODULAR PROTECTION STRATEGY
Bench + Canopy + Amphitheater + Planting

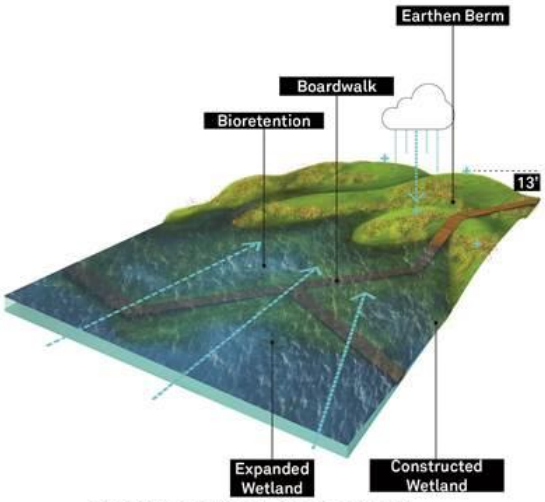
ECOLOGICAL PATH
Berm + Public Realm

STRUCTURAL FLOOD REDUCTION

17

ALTERNATIVE 1: CONCEPT DIAGRAMS

RESIDENTIAL PASSAGE
Cantilevered Walkway



FLUVIAL WETLAND PARK
A Flooded View of the Park

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STRUCTURAL FLOOD REDUCTION

18

ALTERNATIVE 1: CONCEPT DIAGRAMS

INTERIOR DEPLOYABLE STRATEGY
Proposed Improvements

PLANTED STREET MEDIAN
Flood Wall + Planting

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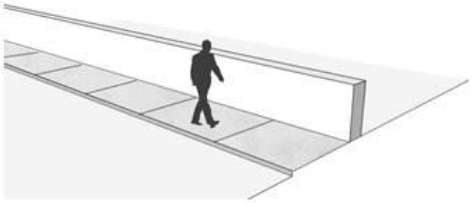
STRUCTURAL FLOOD REDUCTION

19

ALTERNATIVE 1: KIT OF PARTS



BASIC FLOOD WALL

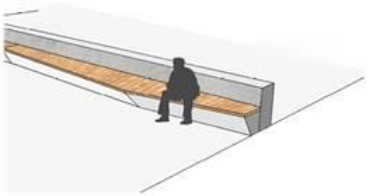
SHEET PILE

STRUCTURAL FLOOD REDUCTION

20

ALTERNATIVE 1: KIT OF PARTS

VINE PLANTING



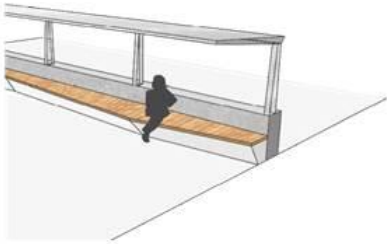
BENCH

STRUCTURAL FLOOD REDUCTION

21

ALTERNATIVE 1: KIT OF PARTS

PLANTER

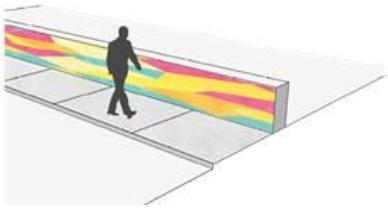


CANOPY

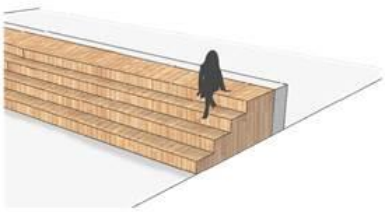
STRUCTURAL FLOOD REDUCTION

22

ALTERNATIVE 1: KIT OF PARTS



ART

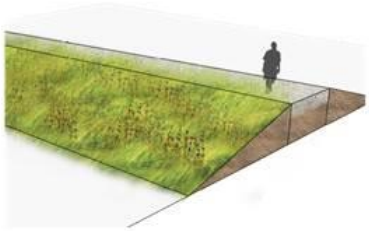


AMPHITHEATER

STRUCTURAL FLOOD REDUCTION

23

ALTERNATIVE 1: KIT OF PARTS



BERM + PATH

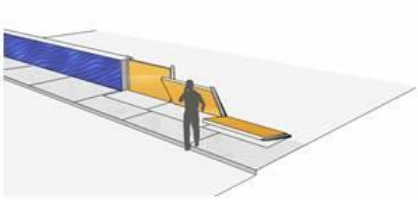
BERM + WALL

STRUCTURAL FLOOD REDUCTION

24

ALTERNATIVE 1: KIT OF PARTS

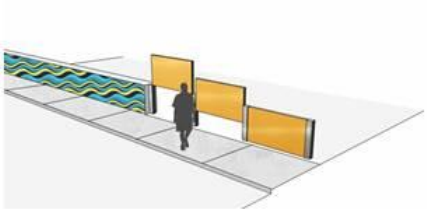
CANTILEVERED WALKWAY



FLIP DEPOLYABLE

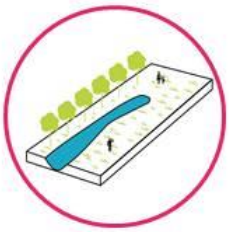
STRUCTURAL FLOOD REDUCTION

ALTERNATIVE 1: KIT OF PARTS



PANEL DEPOLYABLE

INFLATABLE DEPLOYABLE



ALTERNATIVE 2

STORM WATER DRAINAGE IMPROVEMENTS

NETWORK MAP + CONCEPTS + KIT OF PARTS

STORM WATER DRAINAGE IMPROVEMENTS

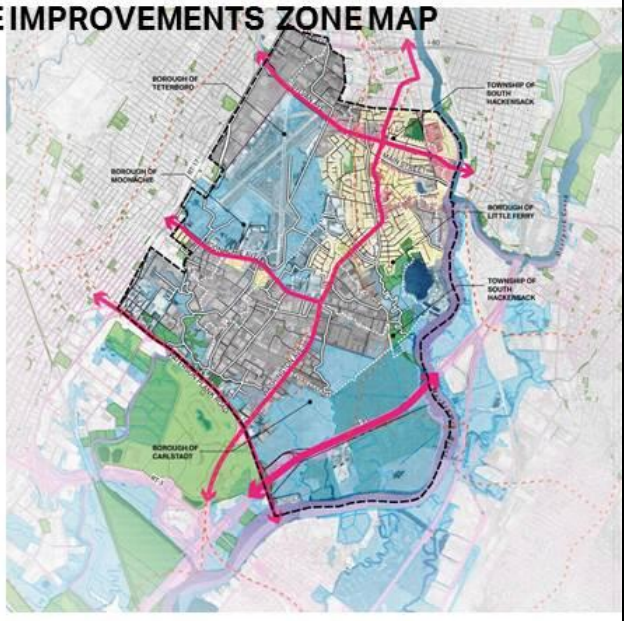
27

ALTERNATIVE 2: STORM WATER DRAINAGE IMPROVEMENTS ZONE MAP

Location Key

Legend

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

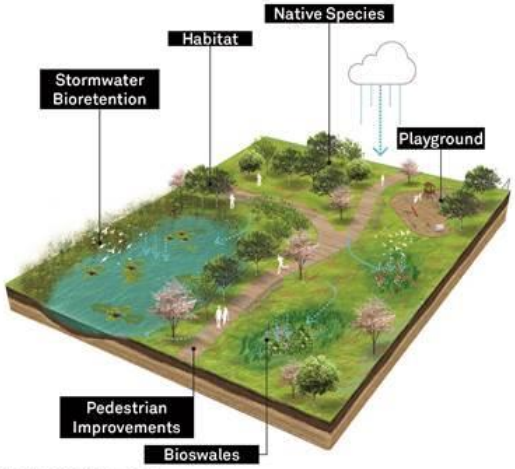


- Topographic edges & watersheds define natural catchment basins.
- Transit edges help define roadway connectors with green infrastructure.
- Zoning edges, especially industrial, residential, and commercial help define areas of focus.

STORM WATER DRAINAGE IMPROVEMENTS

28

ALTERNATIVE 2: CONCEPT DIAGRAMS



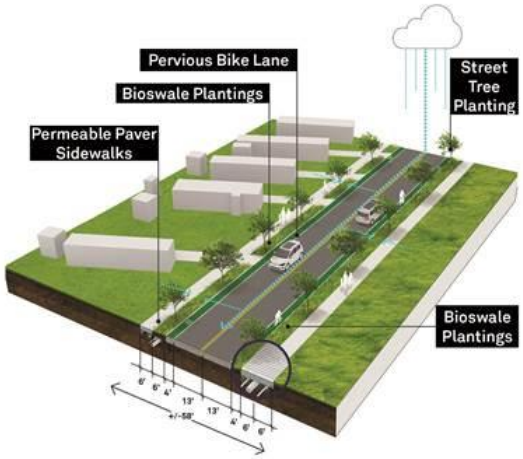
OPEN SPACE
Managing Water + Providing Open Space

STREET IMPROVEMENTS
Walkable Streets + Bike Lanes

STORM WATER DRAINAGE IMPROVEMENTS

29

ALTERNATIVE 2: CONCEPT DIAGRAMS



STREET IMPROVEMENTS
Bike Lanes + Bioswales

STREET IMPROVEMENTS
Permeable Paving + Runnel + Street Trees

STORM WATER DRAINAGE IMPROVEMENTS

30

ALTERNATIVE 2: CONCEPT DIAGRAMS

REVIVING THE DITCH
Option 1: Extend the Riparian Corridor

REVIVING THE DITCH
Option 2: Daylight and Enhance the Ditch

STORM WATER DRAINAGE IMPROVEMENTS

31

ALTERNATIVE 2: KIT OF PARTS

SUBSURFACE INFRASTRUCTURE

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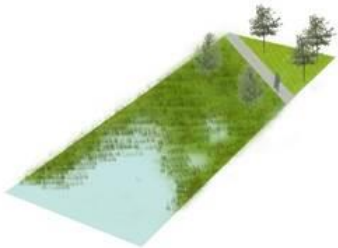
STORM WATER DRAINAGE IMPROVEMENTS

32

ALTERNATIVE 2: KIT OF PARTS

OPEN SPACE



WETLAND ENHANCEMENT/CREATION

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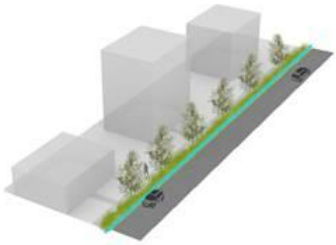
STORM WATER DRAINAGE IMPROVEMENTS

33

ALTERNATIVE 2: KIT OF PARTS

BIOSWALE



RUNNEL

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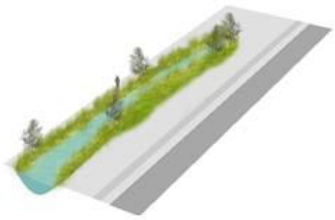
STORM WATER DRAINAGE IMPROVEMENTS

34

ALTERNATIVE 2: KIT OF PARTS



BIORETENTION

RAIN GARDEN

REBUILD BY DESIGN MEADOWLANDS Citizen Advisory Group (CAG) Meeting #4 // September 20, 2016 AECOM

STORM WATER DRAINAGE IMPROVEMENTS

35

ALTERNATIVE 2: KIT OF PARTS

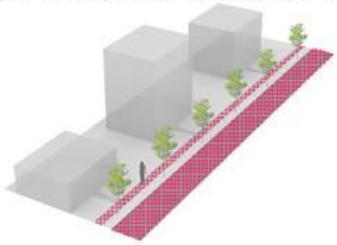
FILTER STRIP

BIKEABLE STREETS

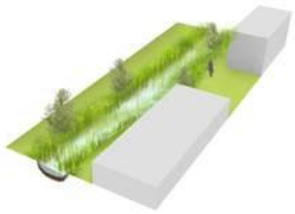
STORM WATER DRAINAGE IMPROVEMENTS

36

ALTERNATIVE 2: KIT OF PARTS



PERMEABLE PAVING



WIDENING DITCHES

ALTERNATIVE 3

HYBRID

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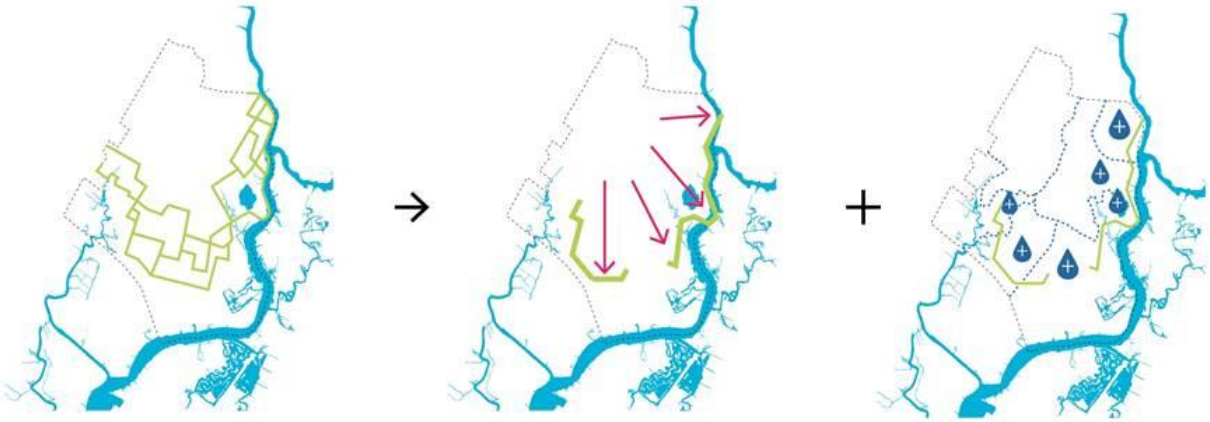
HYBRID

38

ALTERNATIVE 3: PRIORITIES AND TRADEOFFS



Several Options for Protection

Consider Protected Areas

Identify Storm Water Improvement Areas

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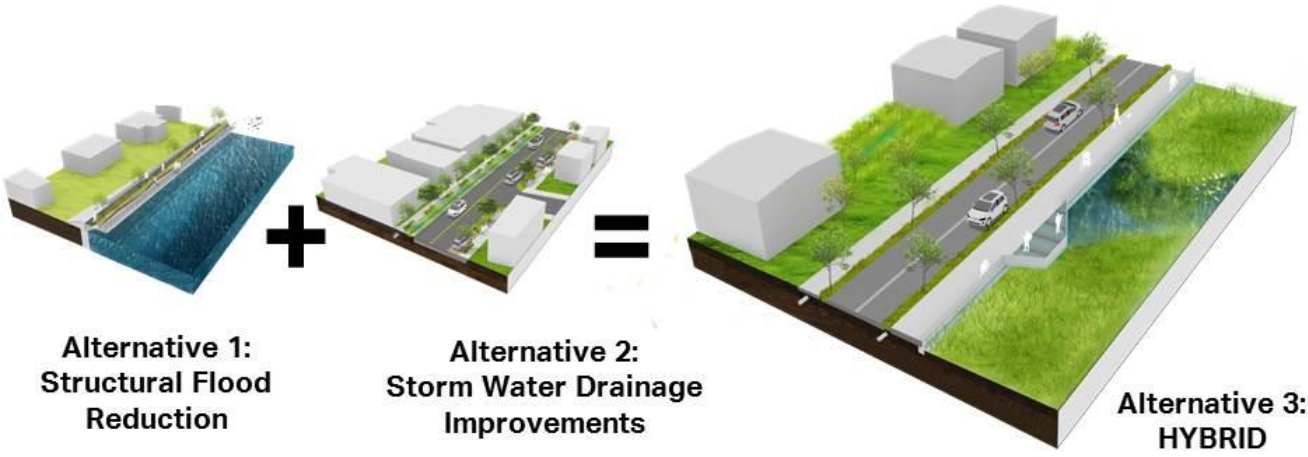
HYBRID

39

ALTERNATIVE 3: PRIORITIES AND TRADEOFFS



Alternative 1: Structural Flood Reduction

Alternative 2: Storm Water Drainage Improvements

Alternative 3: HYBRID

*Priorities and tradeoffs will be discussed in groups

BREAKOUT SESSION & NEXT STEPS

REBUILD BY DESIGN MEADOWLANDS Citizen Advisory Group (CAG) Meeting #4 // September 20, 2016 AECOM

AGENDA

41

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)

NEXT STEPS

Chris Benosky, AECOM

42

Moving from "Kit of Parts" to Concepts

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

NEXT STEPS

Linda Fisher, NJDEP

43

NJDEP / AECOM upcoming activities:

- Prepare Meeting Summary for this meeting
- Continue developing:
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CAG: CALL TO ACTION

- Submit comments by **September 30, 2016** on Concept Handout
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- Continue to build interest in the Project
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- Ensure the public knows about upcoming information (to be posted on Project website)

NEXT STEPS

Critical Schedule Dates (approximate):

Monday, October 24

CAG Meeting #5: Initial Concept Alternatives

THANK YOU!

Attachment 2. Meeting Handout

REBUILD BY DESIGN

MEADOWLANDS

CITIZEN ADVISORY GROUP (CAG) MEETING #4

CONCEPT COMPONENT DEVELOPMENT

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

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

Table of Contents

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

REBUILD BY DESIGN

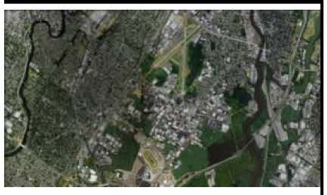
MEADOWLANDS

FLOOD PROTECTION PROJECT

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

CITIZEN ADVISORY GROUP (CAG) MEETING #4

CONCEPT COMPONENT DEVELOPMENT



AGENDA

Linda Fisher, NJDEP

2

- Welcome & Opening Remarks

PROJECT STATUS UPDATE

Chris Benosky, AECOM

3

- 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*)

MEETING OBJECTIVES

4

Building the Concepts

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

ALTERNATIVES

5

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.

ABOUT THE PROCESS

6

Things to Keep in Mind

- **"Kit of Parts"**
  - Tool to Assist in the Development of Concepts
- **Balance and Tradeoff**
  - The "Kit of Part" 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

MEETING FORMAT

7

- **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)

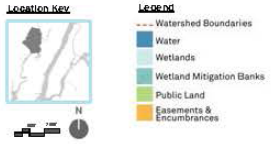
"KIT OF PARTS" - DESIGN CONSIDERATIONS

Susan Bemis, AECOM

DESIGN CONSIDERATIONS - Overlays

9

EASEMENTS & PUBLIC LAND



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.

DESIGN CONSIDERATIONS - Overlays

10

EVACUATION ROUTES & ZONING

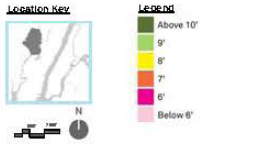
Legend
- Watershed Boundaries
- Water
- Wetlands
- Wetland Mitigation Banks
- Evacuation Routes
- Residential
- Commercial
- Light Industrial

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

DESIGN CONSIDERATIONS - Overlays

11

PROJECT AREA HIGH POINTS



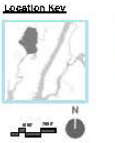
Legend
- Above 10'
- 9'
- 8'
- 7'
- 6'
- Below 6'

- 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.

DESIGN CONSIDERATIONS – Overlays

12

DITCHES & LEGACY BERMS



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

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

DESIGN CONSIDERATIONS - Overlays

13

100 YEAR FLOOD PLAIN

Legend
- Municipality
- Water
- 100 Year Floodplain
- Residential
- Commercial
- Light Industrial

- This graphic shows the severity of the risk and vulnerability of the Meadowlands. Almost the entire site sits within the 100 year flood plain.

ALTERNATIVE 1

STRUCTURAL FLOOD REDUCTION

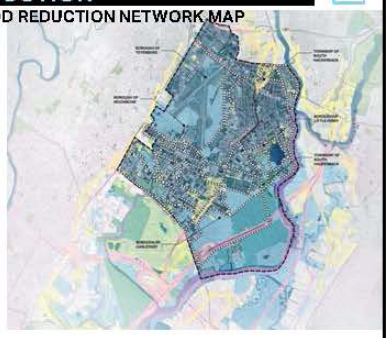
NETWORK MAP + CONCEPTS + KIT OF PARTS

STRUCTURAL FLOOD REDUCTION

15

ALTERNATIVE 1: STRUCTURAL FLOOD REDUCTION NETWORK MAP

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



- Topographic high points, encumbrances, and public land create a map of potential paths for structural flood reduction.
- The network helps compare different options to "close the loop" and successfully provide flood protection.

STRUCTURAL FLOOD REDUCTION

16

ALTERNATIVE 1: CONCEPT DIAGRAMS

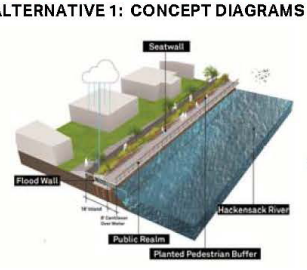
MODULAR PROTECTION STRATEGY
Bench + Canopy + Amphitheater + Planting

ECOLOGICAL PATH
Berm + Public Realm

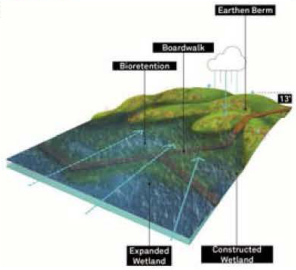
STRUCTURAL FLOOD REDUCTION

17

ALTERNATIVE 1: CONCEPT DIAGRAMS



RESIDENTIAL PASSAGE
Cantilevered Walkway



FLUVIAL WETLAND PARK
A Flooded View of the Park

STRUCTURAL FLOOD REDUCTION

18

ALTERNATIVE 1: CONCEPT DIAGRAMS

INTERIOR DEPLOYABLE STRATEGY
Proposed Improvements

PLANTED STREET MEDIAN
Flood Wall + Planting

STRUCTURAL FLOOD REDUCTION

19

ALTERNATIVE 1: KIT OF PARTS

BASIC FLOOD WALL

SHEET PILE

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STRUCTURAL FLOOD REDUCTION

20

ALTERNATIVE 1: KIT OF PARTS

VINE PLANTING

BENCH

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STRUCTURAL FLOOD REDUCTION

21

ALTERNATIVE 1: KIT OF PARTS

PLANTER

CANOPY

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STRUCTURAL FLOOD REDUCTION

22

ALTERNATIVE 1: KIT OF PARTS

ART

AMPHITHEATER

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STRUCTURAL FLOOD REDUCTION

23

ALTERNATIVE 1: KIT OF PARTS

BERM + PATH

BERM + WALL

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STRUCTURAL FLOOD REDUCTION

24

ALTERNATIVE 1: KIT OF PARTS

CANTILEVERED WALKWAY

FLIP DEPOLYABLE

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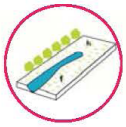
STRUCTURAL FLOOD REDUCTION

25

ALTERNATIVE 1: KIT OF PARTS

PANEL DEPOLYABLE

INFLATABLE DEPLOYABLE



ALTERNATIVE 2

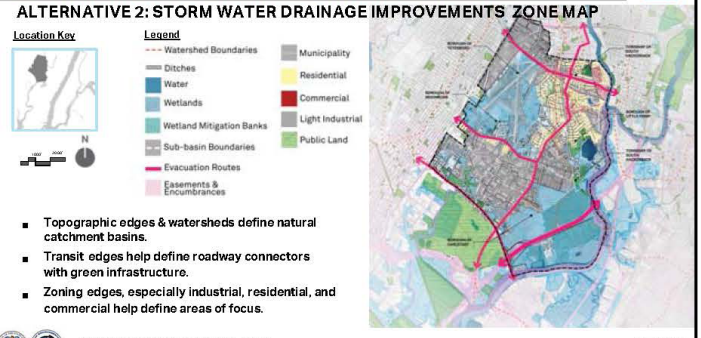
STORM WATER DRAINAGE IMPROVEMENTS

NETWORK MAP + CONCEPTS + KIT OF PARTS

STORM WATER DRAINAGE IMPROVEMENTS

27

ALTERNATIVE 2: STORM WATER DRAINAGE IMPROVEMENTS ZONE MAP

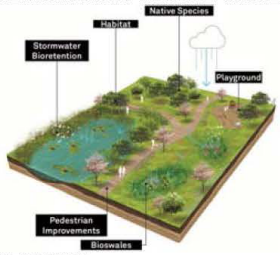


- Topographic edges & watersheds define natural catchment basins.
- Transit edges help define roadway connectors with green infrastructure.
- Zoning edges, especially industrial, residential, and commercial help define areas of focus.

STORM WATER DRAINAGE IMPROVEMENTS

28

ALTERNATIVE 2: CONCEPT DIAGRAMS



OPEN SPACE
Managing Water + Providing Open Space

STREET IMPROVEMENTS
Walkable Streets + Bike Lanes

STORM WATER DRAINAGE IMPROVEMENTS

29

ALTERNATIVE 2: CONCEPT DIAGRAMS

STREET IMPROVEMENTS
Bike Lanes + Bioswales

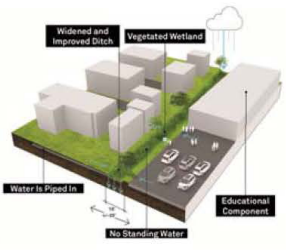
STREET IMPROVEMENTS
Permeable Paving + Runnel + Street Trees

STORM WATER DRAINAGE IMPROVEMENTS

30

ALTERNATIVE 2: CONCEPT DIAGRAMS

REVIVING THE DITCH
Option 1: Extend the Riparian Corridor



REVIVING THE DITCH
Option 2: Daylight and Enhance the Ditch

STORM WATER DRAINAGE IMPROVEMENTS

31

ALTERNATIVE 2: KIT OF PARTS

SUBSURFACE INFRASTRUCTURE

STORM WATER DRAINAGE IMPROVEMENTS

32

ALTERNATIVE 2: KIT OF PARTS

OPEN SPACE

WETLAND ENHANCEMENT/CREATION

STORM WATER DRAINAGE IMPROVEMENTS

33

ALTERNATIVE 2: KIT OF PARTS

BIOSWALE

RUNNEL

STORM WATER DRAINAGE IMPROVEMENTS

34

ALTERNATIVE 2: KIT OF PARTS

BIORETENTION

RAIN GARDEN

STORM WATER DRAINAGE IMPROVEMENTS

35

ALTERNATIVE 2: KIT OF PARTS

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BIKEABLE STREETS

STORM WATER DRAINAGE IMPROVEMENTS

36

ALTERNATIVE 2: KIT OF PARTS

PERMEABLE PAVING

WIDENING DITCHES

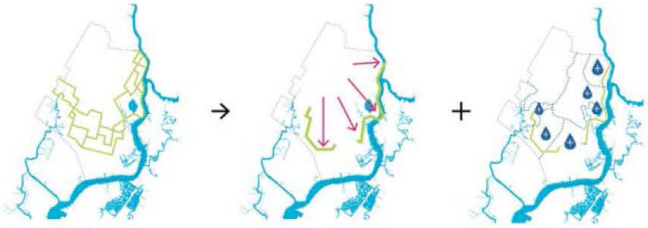
ALTERNATIVE 3

HYBRID

HYBRID

38

ALTERNATIVE 3: PRIORITIES AND TRADEOFFS



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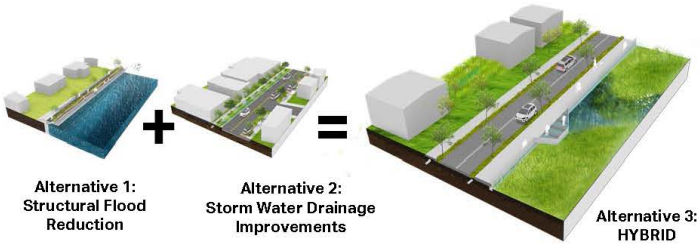
HYBRID

39

ALTERNATIVE 3: PRIORITIES AND TRADEOFFS



Alternative 1: Structural Flood Reduction

Alternative 2: Storm Water Drainage Improvements

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BREAKOUT SESSION & NEXT STEPS

AGENDA

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NEXT STEPS

45

Critical Schedule Dates (approximate):

Monday, October 24
CAG Meeting #5: Initial Concept Alternatives

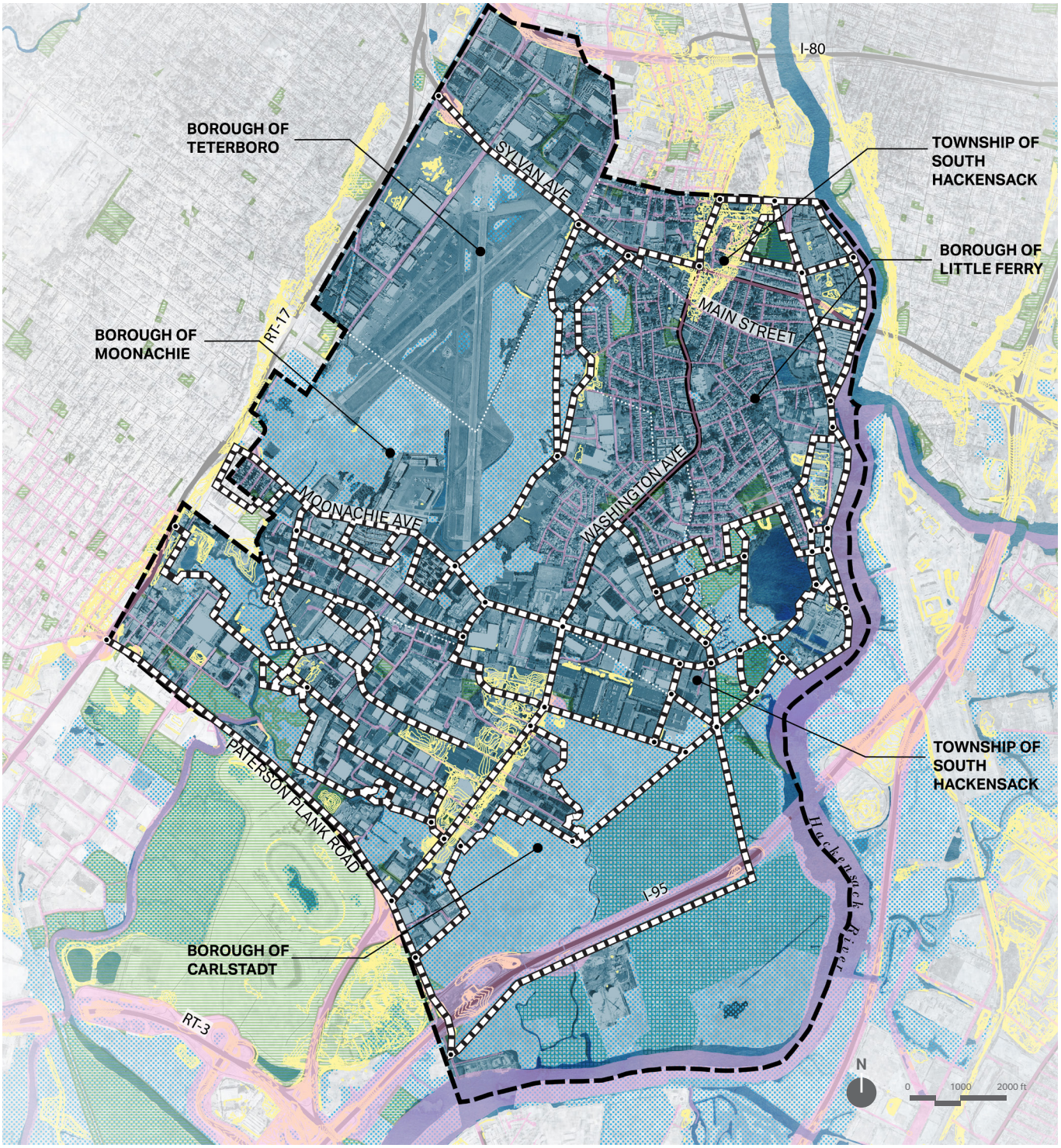
THANK YOU!

4.0 Boards

ALTERNATIVE 1: NETWORK ANALYSIS

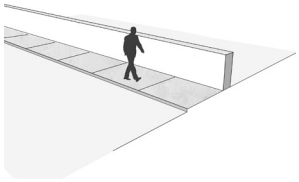
STRUCTURAL FLOOD REDUCTION

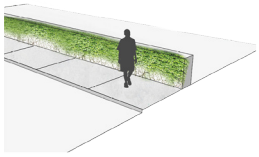
REBUILD BY DESIGN
MEADOWLANDS



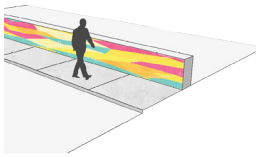
ALTERNATIVE 1: KIT OF PARTS
STRUCTURAL FLOOD REDUCTION

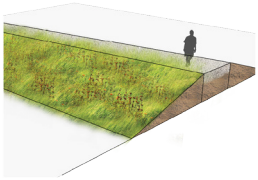
REBUILD BY DESIGN
MEADOWLANDS

BASIC FLOOD WALL


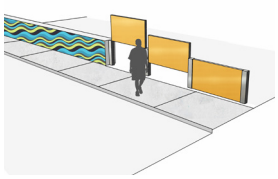

VINE PLANTING


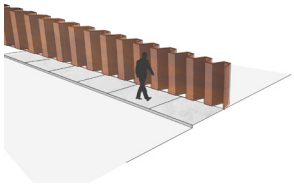

PLANTER

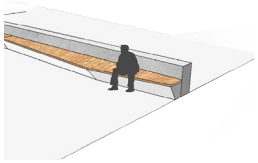
ART


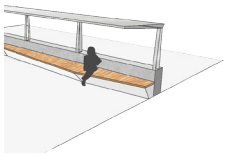

BERM + PATH


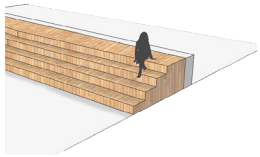

CANTILEVERED WALKWAY

PANEL DEPLOYABLE


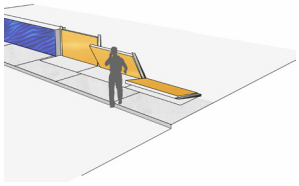

SHEET PILE


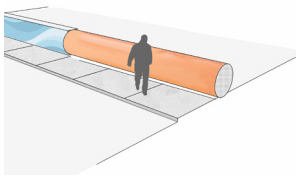

BENCH



CANOPY



AMPHITHEATER



BERM + WALL

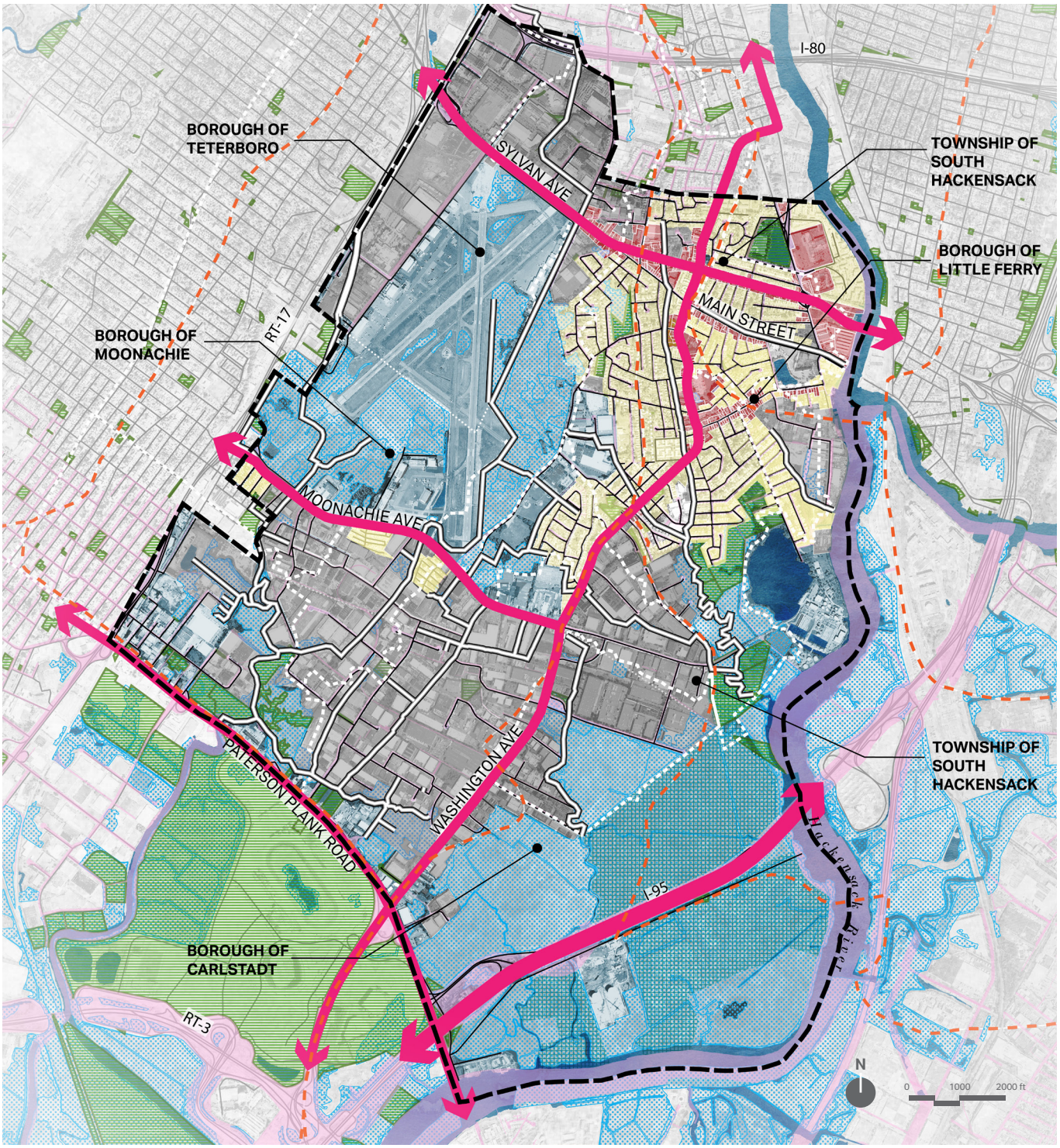
FLIP DEPLOYABLE



INFLATABLE DEPLOYABLE



ALTERNATIVE 2: NETWORK ANALYSIS

STORM WATER DRAINAGE IMPROVEMENTS

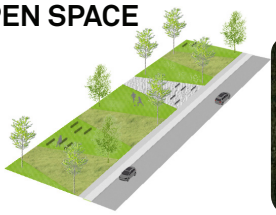
REBUILD BY DESIGN
MEADOWLANDS

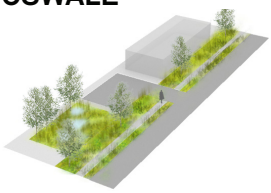


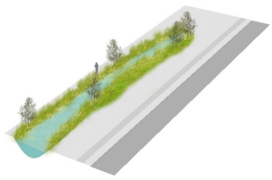
- Ditches
- Water
- Wetlands
- Wetland Mitigation Banks
- Watershed Boundaries
- Sub-basin Boundaries
- Evacuation Routes
- Municipality
- Easements & Encumbrances
- Residential
- Commercial
- Light Industrial
- Public Land

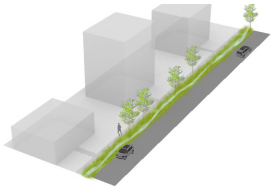
ALTERNATIVE 2: KIT OF PARTS
STORM WATER DRAINAGE IMPROVEMENTS

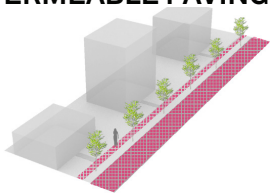
REBUILD BY DESIGN
MEADOWLANDS

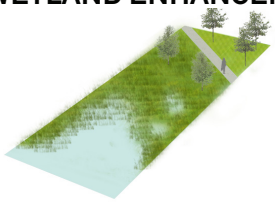
OPEN SPACE


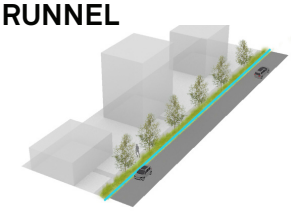

BIOSWALE



BIORETENTION



FILTER STRIP


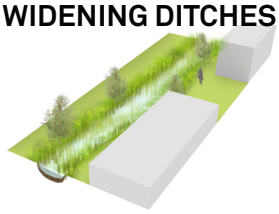
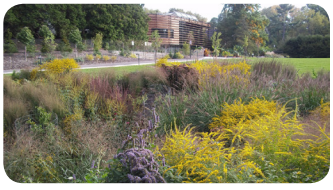

PERMEABLE PAVING



WETLAND ENHANCEMENT/CREATION


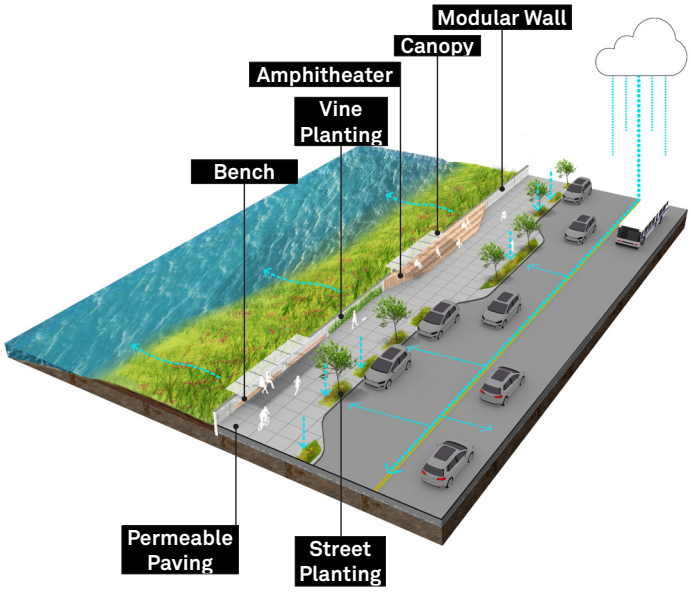

RUNNEL



RAIN GARDEN

BIKEABLE STREETS

WIDENING DITCHES



5.0 Concept Worksheets



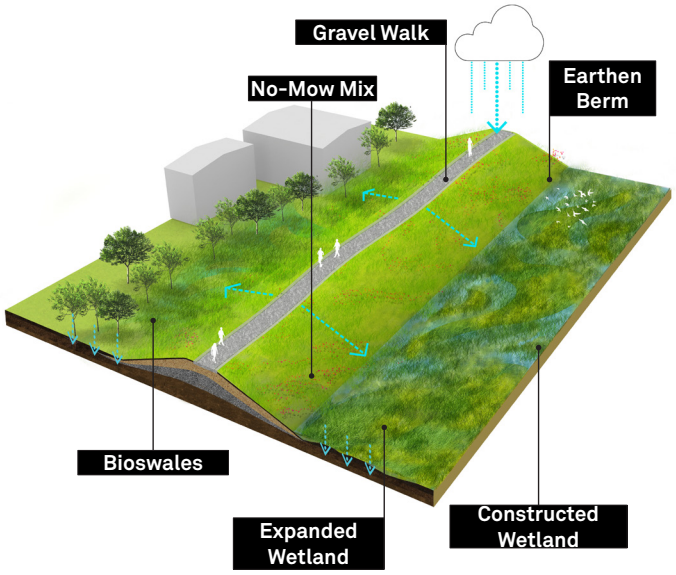
MODULAR PROTECTION STRATEGY

BENCH + CANOPY + AMPHITHEATER + PLANTING

Likes:

Dislikes:

Additional ideas:



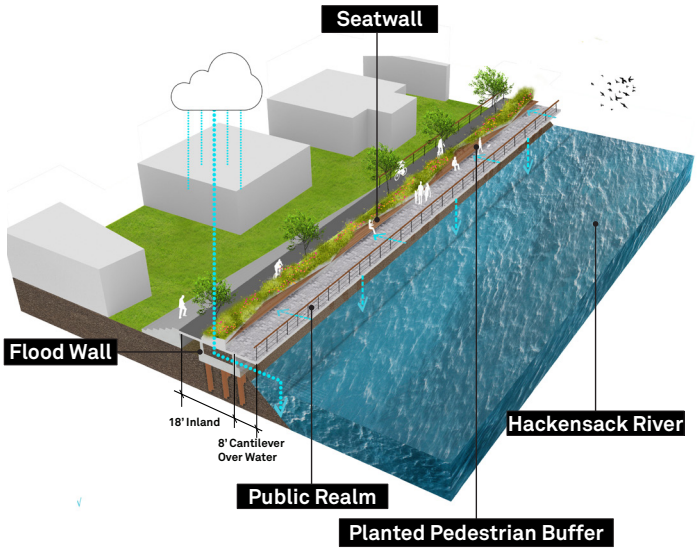
ECOLOGICAL PATH

BERM + PUBLIC REALM

Likes:

Dislikes:

Additional ideas:



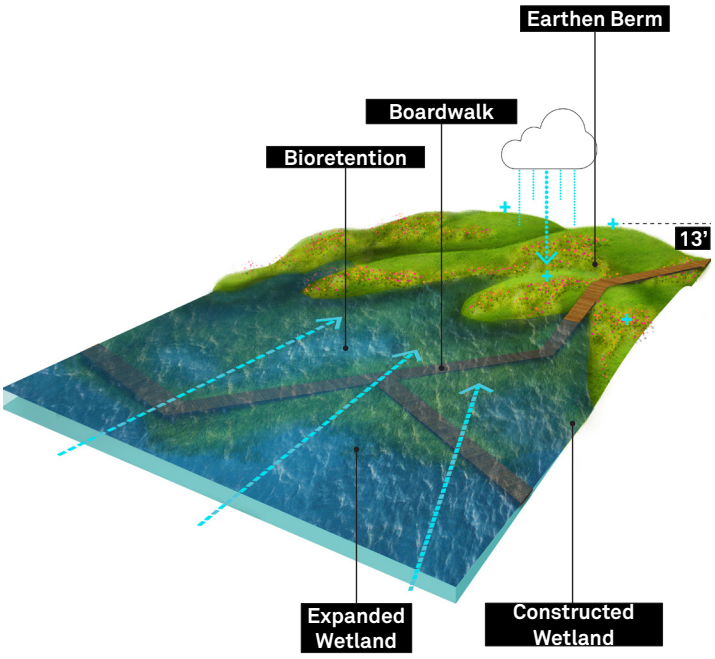
RESIDENTIAL PASSAGE

CANTILEVERED WALKWAY

Likes:

Dislikes:

Additional ideas:



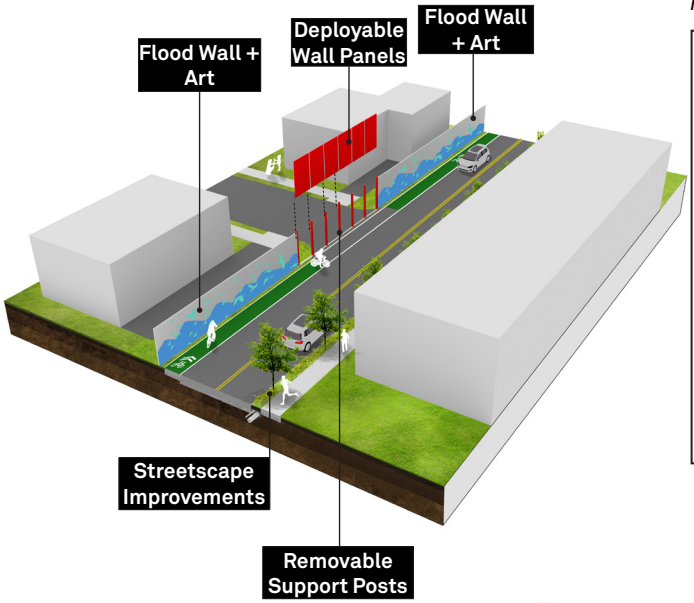
FLUVIAL WETLAND PARK

FLOODED VIEW OF PARK

Likes:

Dislikes:

Additional ideas:



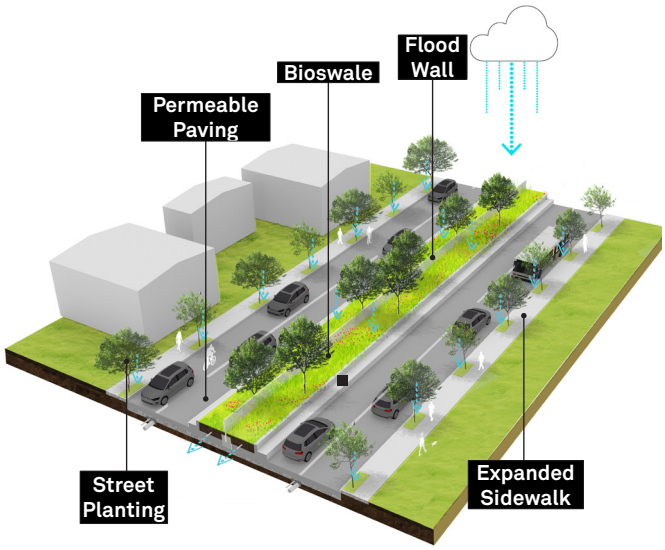
INTERIOR DEPLOYABLE STRATEGY

PROPOSED IMPROVEMENTS

Likes:

Dislikes:

Additional ideas:



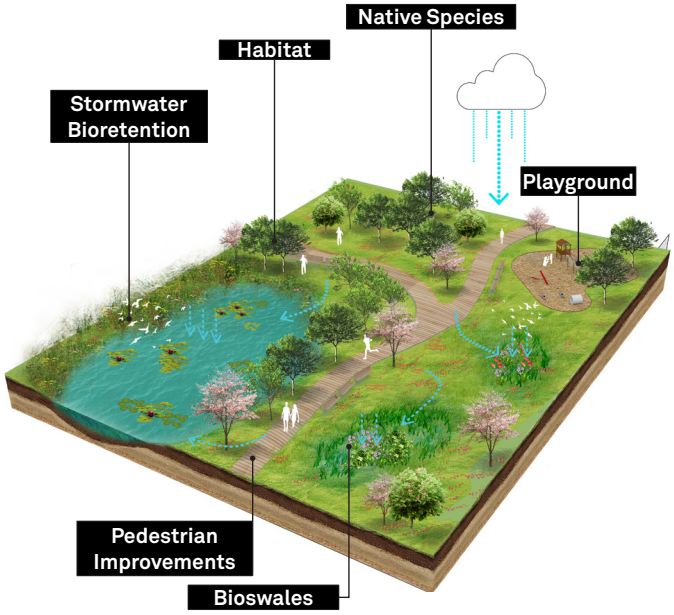
PLANTED STREET MEDIAN

FLOOD WALL + PLANTING

Likes:

Dislikes:

Additional ideas:



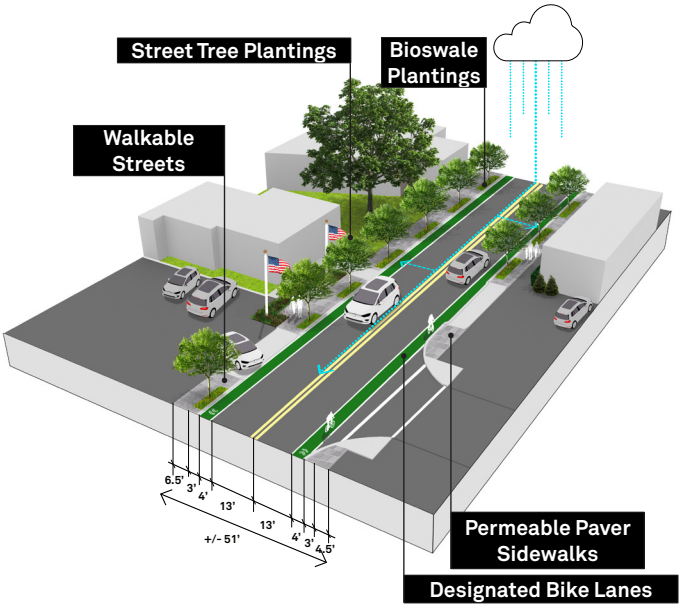
OPEN SPACE

MANAGING WATER + PROVIDING PUBLIC OPEN SPACE

Likes:

Dislikes:

Additional ideas:



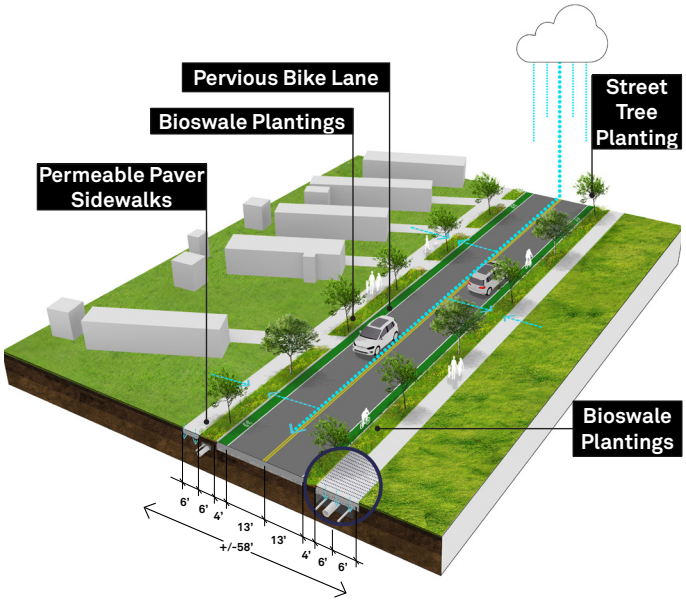
STREET IMPROVEMENTS

WALKABLE STREETS + BIKE LANES

Likes:

Dislikes:

Additional ideas:



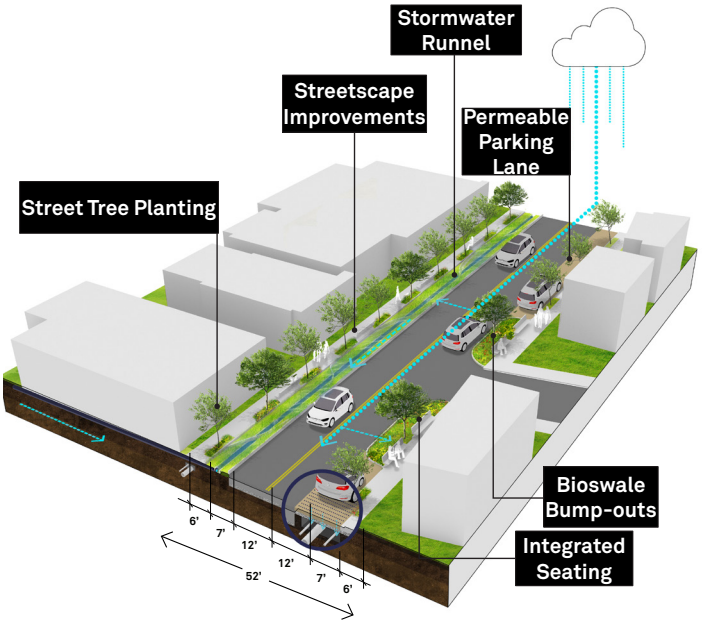
STREET IMPROVEMENTS

BIKE LANES + BIOSWALES

Likes:

Dislikes:

Additional ideas:



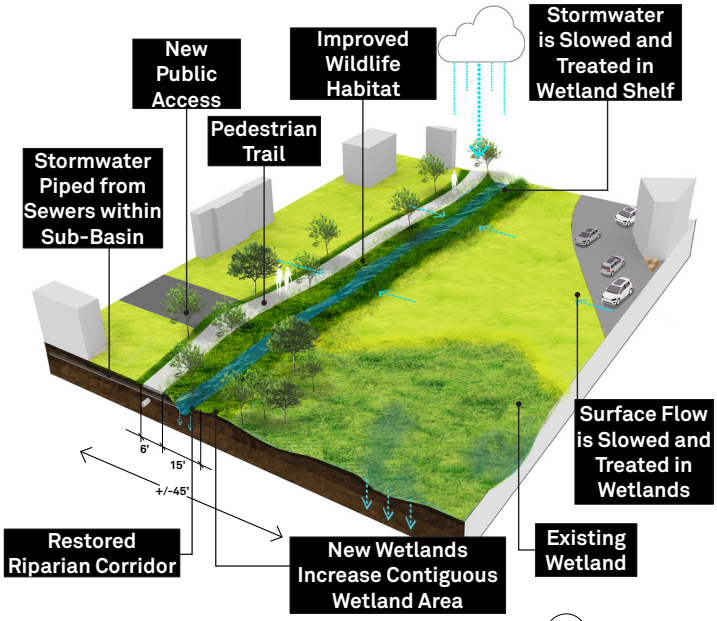
STREET IMPROVEMENTS

PERMEABLE PAVING + RUNNELS + STREET TREES

Likes:

Dislikes:

Additional ideas:



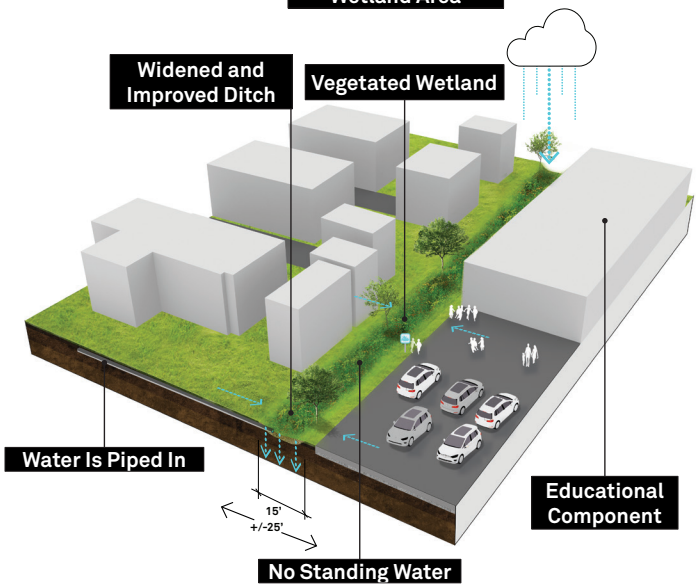
REVIVING THE DITCH

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