REBUILD BY DESIGN
MEADOWLANDS

CITIZEN ADVISORY GROUP (CAG) MEETING #7

STORMWATER DRAINAGE IMPROVEMENTS
AGENDA

- Project Status Update and Schedule
- Alternative 2: Stormwater Drainage Improvements
  - Alternative 2 Development
  - Modeling Update
  - Frequently Flooded Areas
  - Stormwater Drainage Improvement Options
    - Collection and Conveyance
PROJECT STATUS UPDATE

- Developed working draft Concept Screening Criteria
- Completed and published to Project Website:
  - Meeting Minutes from CAG Meeting #6
  - December 2016 Newsletter
- Developing Stormwater Drainage Options
REBUILD BY DESIGN MEADOWLANDS

CAG Meeting #7 // January 31, 2017

ALTERNATIVE 2
PREVIOUS CAG INPUT AND DISCUSSION

• CAG Meeting #2A/B Areas Prone to Flooding within the Project Area
• CAG Meeting #3 Concept Screening Criteria Review
• CAG Meeting #4 Concept Development and Ranking for Alternative 2
• CAG Meeting #5 Review of Drainage Basin Opportunity Areas
ALTERNATIVE 2: PROCESS
DEVELOPMENT OF ALTERNATIVE 2 CONCEPTS

- Concept development process utilized the following to arrive at the 7 concepts:

  CAG & MAYOR PROVIDED INPUT + EXISTING DATA/ANALYSIS + FIELD INVESTIGATION + HYDROLOGIC MODELING + SCREENING CRITERIA
ALTERNATIVE 2:
STORMWATER DRAINAGE IMPROVEMENTS
CHRISTOPHER BENOSKY, AECOM
MODELING UPDATE

SIMPLIFIED MODEL PROGRESS

Conducting modeling to better understand how each of the initial Alternative 2 concepts will function:

a. Quantity of stormwater
b. Movement of stormwater
c. Control of stormwater

Currently, continuing to conduct stormwater system surveys to support more detailed drainage models of each of the concepts

Future use of modeling results:

a. Assess each concept’s hydraulic feasibility (to control and move stormwater volumes)
b. Preliminarily determine the benefits each concept would provide relative to cost
MODELING UPDATE
SIMPLIFIED MODEL PROGRESS

- Completed development and application of simplified models for:
  - East and West Riser
  - Main Street
  - Carol Place
  - East Carlstadt
  - Losen Slote
  - DePeyster Creek
  - Peach Island Creek
STORMWATER SUBBASINS

- THERE ARE 20 SUBBASIN AREAS WITHIN THE PROJECT AREA

A: UPPER EAST RISER
B: MIDDLE EAST RISER
C: LOWER EAST RISER
D: UPPER WEST RISER 1
E: UPPER WEST RISER 2
F: MIDDLE WEST RISER
G: LOWER WEST RISER
H: UPPER LOSEN SLOTE 1
I: UPPER LOSEN SLOTE 2
J: MOONACHE
K: CARLSTADT
L: INDIAN LAKE
M: MAIN STREET
N: DEPEYSTER CREEK
O: LOWER LOSEN SLOTE
P: UPPER HACKENSACK
Q: MIDDLE HACKENSACK 1
R: MIDDLE HACKENSACK 2
S: LOWER HACKENSACK
T: BERRY’S CREEK
STORMWATER SUBBASINS

FLOW DIRECTION

- SUBBASINS BOUNDARIES IDENTIFY HOW WATER IS FLOWING ON SITE TOWARDS A COMMON POINT
- THE HYDROLOGIC MODELING IS BASED ON THESE SUBBASIN AREAS
FREQUENTLY FLOODED AREAS
OVERALL MAP – COMMUNITY FEEDBACK

- Integrating community feedback into modeling
- Focusing our attention on frequently flooded areas during the development of stormwater drainage improvement concepts
FREQUENTLY FLOODED AREAS

LITTLE FERRY

BRANDT STREET

Flood Event Date: OCTOBER 14, 2005

Estimated Flood Elevation: 4.5 NAVD88

Image Source: Hackensack Meadowlands Floodplain Management Plan (Oct 24, 2005)
FREQUENTLY FLOODED AREAS
MOONACHIE

110 ASIA PLACE
Flood Event Date:
JUNE 10, 2005
Estimated Flood Elevation:
3.75 NAVD88

Image Source: Hackensack Meadowlands Floodplain Management Plan (Oct 24, 2005)
FREQUENTLY FLOODED AREAS

MOONACHIE

1 CAROL PLACE

Flood Event Date:
OCTOBER 12, 2005

Estimated Flood Elevation:
4.8 NAVD88

Image Source: Hackensack Meadowlands Floodplain Management Plan (Oct 24, 2005)
FREQUENTLY FLOODED AREAS

CARLSTADT

140 KERO ROAD
Flood Event Date: JULY 8, 2005
Estimated Flood Elevation: 4.5 NAVD88

Image Source: Hackensack Meadowlands Floodplain Management Plan (Oct 24, 2005)
DRAINAGE IMPROVEMENT CONCEPT 1
MAIN STREET CONCEPT + AFFECTED SUBBASINS

M: MAIN STREET
L: INDIAN LAKE
H: UPPER LOSEN SLOT 1

CONCEPT 1

M: SUBBASIN NAME
L: SUBBASIN NAME
H: MUNICIPAL BOUNDARY
H: PROJECT AREA
H: WATER
H: AFFECTED SUBBASIN

NOT TO SCALE
DRAINAGE IMPROVEMENT CONCEPT 1

- CONNECTING FEATURES ALONG MAIN STREET, BERGEN TURNPIKE, SYLVAN AVE, WILLOW LAKE PARK, INDIAN LAKE, AND NEW OPEN SPACE FEATURES ON THE HACKENSACK RIVER

- IMPROVEMENTS INCLUDE BIOSWALEs, RAIN GARDENS, BUMP OUTS, MEDIAN PLANTING, NEW OPEN SPACE, AND OPEN SPACE IMPROVEMENTS
DRAINAGE IMPROVEMENT CONCEPT 1

MAIN STREET CONVEYANCE

- IMPROVED PUMP STATIONS AT LITTLE FERRY CIRCLE, MAIN STREET, AND WILLOW LAKE. BERM TO INCREASE STORAGE CAPACITY AT INDIAN LAKE
- IMPROVE CONVEYANCE BY INCREASING CULVERT SIZES ALONG MAIN STREET
NEW OPEN SPACE

PERMEABLE PAVERS
Slows the flow of stormwater before entering conveyance network

BIOSWALE
Stormwater is captured and treated in bioswales with native vegetation

NEW PUBLIC OPEN SPACE
Underutilized land becomes a public amenity for recreation and gathering

WETLAND ENHANCEMENT
Enhanced wetlands provide habitat and educational opportunities

BIORETENTION
Filters 80-90% of suspended solids and slows flow of stormwater into subsurface conveyance systems
DRAINAGE IMPROVEMENT CONCEPT 2
DEPEYSTER CREEK CONCEPT + AFFECTED SUBBASINS

N: DEPEYSTER CREEK
I: UPPER LOSEN SLOTE 1
DRAINAGE IMPROVEMENT CONCEPT 2

DEPYSTER CREEK COLLECTION

- CONNECTING FEATURES ALONG DEPYSTER CREEK, MEHRHOF RD, MONROE ST, AND THE HACKENSACK RIVER

- IMPROVEMENTS INCLUDE NEW OPEN SPACE, OPEN SPACE IMPROVEMENTS, RECREATION, BIOSWALES, PERMEABLE PAVING, BIORETENTION, AND RAIN GARDENS
DRAINAGE IMPROVEMENT CONCEPT 2

DEPEYSTER CREEK CONVEYANCE

- INCREASE CHANNEL CONVEYANCE AND IMPROVE PUMP STATION AT DEPEYSTER CREEK
- CHANNEL BERMING TO INCREASE CAPACITY AT DEPEYSTER CREEK

DEPEYSTER CREEK PUMP STATION

IMPROVED CHANNEL CONVEYANCE

CHANNEL BERMING

DEPEYSTER CREEK CONVEYANCE

INCREASE CHANNEL CONVEYANCE AND IMPROVE PUMP STATION AT DEPEYSTER CREEK

CHANNEL BERMING TO INCREASE CAPACITY AT DEPEYSTER CREEK
IMPROVED PUMP STATION + NEW OPEN SPACE

PUMP STATION IMPROVEMENTS
Increase capacity of pump station and add decorative screens or vegetation to improve visual quality

BERM-UP THE CHANNEL
Portions of DePeyster Creek banks are bermed to increase stormwater conveyance capacity

PERMEABLE PAVERS
Stormwater is filtered under parked care for new open space park

NEW PUBLIC OPEN SPACE
Underutilized land is improved

BIOSWALE
Stormwater is captured and treated in bioswales with native vegetation
DRAINAGE IMPROVEMENT CONCEPT 3
MOONACHIE CONCEPT + AFFECTED SUBBASINS

O: LOWER LOSEN SLOTE
J: MOONACHIE
K: CARLSTADT
B: MIDDLE EAST RISER
F: MIDDLE WEST RISER
C: LOWER EAST RISER
G: LOWER WEST RISER
DRAINAGE IMPROVEMENT CONCEPT 3

MOONACHIE COLLECTION

- Connecting features along Empire Blvd, and Moonachie Road
- Improvements include bioswales, median planting, new open space, and recreation

- Moonachie Collection
- Connecting Features Along Empire Blvd, and Moonachie Road
- Improvements Include Bioswales, Median Planting, New Open Space, and Recreation

Rain Garden
Median Planting
Permeable Paver
Open Space Improvement
Bi swale
Channel Improvement
Open Space Improvement

Subbasin Boundary
Subbasin Name
Municipal Boundary
Project Area
Existing Ditch/Creek
Water
Road
Green Street
Existing Open Space
Wetland
Improved Open Space
Permeable Paver
Rain Garden
Channel Improvement
Not to Scale
DRAINAGE IMPROVEMENT CONCEPT 3

MOONACHIE CONVEYANCE

- OFF CHANNEL STORAGE, INCREASED CONVEYANCE, AND LOCAL DRAINAGE IMPROVEMENTS
- BACK FLOW PROTECTION FOR OUTFALLS TO LOSEN SLOTE
BIOSWALES + STREET IMPROVEMENTS

PERMEABLE PAVERS
Slows the flow of stormwater before entering conveyance network

BIOSWALES
Provides habitat and filters pollutants before directing stormwater to conveyance system

CURB CUTS
Allows infiltration of road runoff into adjacent bioswales while maintaining the safety with a raised curb

SUBSURFACE CONVEYANCE
Improved subsurface pipe network reduces potential flooding
DRAINAGE IMPROVEMENT CONCEPT 4
LOSEN SLOTE CONCEPT + AFFECTED SUBASINS

O: LOWER LOSEN SLOTE
I: UPPER LOSEN SLOTE 2
M: MAIN STREET
H: UPPER LOSEN SLOTE 1
B: MIDDLE EAST RISER
CONNECTING FEATURES AT MOONACHIE POLICE DEPT, ROBERT CRAIG ELEM, WASHINGTON ELEM, LITTLE FERRY ELEM, MUNICIPAL BLDG, PUBLIC LIBRARY, AND LOCAL PARKS

IMPROVEMENTS INCLUDE PERMEABLE PAVING, BIOSWALES, RAIN GARDENS, WETLAND IMPROVEMENTS, RECREATION, AND OPEN SPACE IMPROVEMENTS
DRAINAGE IMPROVEMENT CONCEPT 4

LOSEN SLOTE CONVEYANCE

- CHANNEL IMPROVEMENTS, HABITAT RESTORATION, NEW PUMP STATION, FORCE MAINS, AND BOOSTER PUMPS

- SUPPLEMENTAL DREDGING, SETTLING BASIN/FOREBAY TO RECEIVE FLOW FROM FORCE MAINS FOR UPPER LOSEN SLOTE, AND BACKFLOW PROTECTION FOR RESIDENTIAL OUTFALLS
IMPROVEMENTS TO CIVIC AMENITY PROPERTY

**CHANNEL IMPROVEMENTS**
Improved force main in channel to increase conveyance capacity for Losen Slot.

**PERMEABLE PAVERS**
Stormwater is collected and filtered under loading area.

**BIOSWALE**
Stormwater is captured and treated in bioswales with native vegetation.

**NATIVE PLANTED AREAS**
Native vegetation creates habitat and forms buffers between land uses.

**SUBSURFACE CONVEYANCE**
Improved subsurface pipe network reduces potential flooding.

**RAIN GARDENS**
Stormwater is captured in gardens with native vegetation.
DRAINAGE IMPROVEMENT CONCEPT 5
ALL WEST RISER CONCEPT + AFFECTED SUBBASINS

D: UPPER WEST RISER 1
E: UPPER WEST RISER 2
F: MIDDLE WEST RISER
G: LOWER WEST RISER
C: LOWER EAST RISER
DRAINAGE IMPROVEMENT CONCEPT 5

ALL WEST RISER COLLECTION

- MEDIAN PLANTING, BIOSWALEs, STREET IMPROVEMENTS, AND RAIN GARDENS ON MOONACHEE AVE
DRAINAGE IMPROVEMENT CONCEPT 5

ALL WEST RISER CONVEYANCE

- NEW PUMP STATION NEAR WEST RISER TIDE GATE, CHANNEL IMPROVEMENTS, AND HABITAT RESTORATION

- IMPROVED VINCENT PUMP STATION, AND BERMS TO INCREASE CHANNEL CONVEYANCE CAPACITY
NEW PUMP STATION

BIOSWALE
Stormwater is captured and treated in rain gardens with native vegetation.

PUMP STATION IMPROVEMENTS
Improved conveyance capacity

CURB CUT
Allows infiltration of road runoff into adjacent bioswales while maintaining the safety of raised curb

DRAINAGE PIPE
Allows filtered water to be efficiently drained from site
CHANNEL + HABITAT IMPROVEMENTS

GRAVEL TRENCH
Provides initial infiltration of road runoff before overflow into ecologically improved ditch.

CHANNEL IMPROVEMENTS
Maximizes ecological opportunity and stormwater conveyance to larger watershed.

VEGETATED RIPARIAN BUFFER
Native plantings uptake pollutants before entry into water systems.

BIORETENTION
Filters 80-90% of suspended solids and slows flow of stormwater into combined sewer systems.
ALL EAST RISER CONCEPT + AFFECTED SUBBASINS

A: UPPER EAST RISER
D: UPPER WEST RISER 1
E: UPPER WEST RISER 2
F: MIDDLE WEST RISER
B: MIDDLE EAST RISER
C: LOWER EAST RISER

CONCEPT 6

SUBBASIN BOUNDARY
SUBBASIN NAME
MUNICIPAL BOUNDARY
PROJECT AREA
WATER
AFFECTED SUBBASIN

NOT TO SCALE
DRAINAGE IMPROVEMENT CONCEPT 6

ALL EAST RISER COLLECTION

• IMPROVEMENTS TO EAST RISER DITCH AND NEW OPEN SPACE AT CAESAR PLACE PARK
DRAINAGE IMPROVEMENT CONCEPT 6

ALL EAST RISER CONVEYANCE

- NEW PUMP STATION AT GREEN STREET WITH FORCE MAIN AND IMPROVED CHANNEL CONVEYANCE

- NEW TIDE GATE AND PUMP STATION AT EAST RISER. CHANNEL IMPROVEMENTS WITH HABITAT RESTORATION
OPEN SPACE IMPROVEMENTS

NATIVE PLANTED AREAS
Native vegetation creates habitat and forms buffers between land uses.

NEW PUBLIC OPEN SPACE
Underutilized land becomes a public amenity for recreation and gathering.

PERMEABLE PAVING STRIP
Surface water is graded to permeable paving strips, then filtered into subsurface conveyance.

IMPERMEABLE PAVING STRIP
Flows to permeable paving strips on either side.

SUBSURFACE CONVEYANCE
Conveyance network includes detention tanks that slows storm water release and reduce potential flooding.
DRAINAGE IMPROVEMENT CONCEPT 7
ALL EAST RISER + MAIN STREET WITH DIVERSION CONCEPT + AFFECTED SUBBASINS

- A: Upper East Riser
- B: Middle East Riser
- C: Lower East Riser
- D: Upper West Riser 1
- E: Loose Slot 1
- F: Main Street
- G: Indian Lake
- H: Middle West Riser
- I: Project Area
- M: Subbasin Name
- L: Subbasin Boundary
- K: Municipal Boundary
- N: Not to Scale
- O: Affected Subbasin
DRAINAGE IMPROVEMENT CONCEPT 7
ALL EAST RISER + MAIN STREET WITH DIVERSION CONVEYANCE

- SUBBASIN BOUNDARY: SUBBASIN NAME
- MUNICIPAL BOUNDARY: LOCAL DRAINAGE IMPROVEMENT
- PROJECT AREA: CHANNEL IMPROVEMENT
- EXISTING DITCH/CREEK: FORCE MAIN
- WATER: NEW PUMP STATION
- ROAD: IMPROVED PUMP STATION

NEW PUMP STATION
FORCE MAIN
DEPEYSTER CREEK PUMP STATION
MAIN ST PUMP STATION
NEW PUMP STATION
CHANNEL IMPROVEMENT
FORCE MAIN
IMPROVED PUMP STATION
**BUMP OUTS + STREET IMPROVEMENTS**

- **BUMP-OUTS**
  - Provides habitat and filters pollutants before directing stormwater to subsurface conveyance system.

- **PERMEABLE PAVERS**
  - Slows the flow of stormwater and filters water before entering conveyance system.

- **SUBSURFACE CONVEYANCE**
  - Improved subsurface pipe network reduces potential flooding.

- **CURB CUT**
  - Allows infiltration of road runoff into adjacent bioswales while maintaining the safety of raised curb.

- **FORCE MAIN**
  - Pumped stormwater conveyance to ensure grey infrastructure flood mitigation.
NEXT STEPS

CHRISTOPHER BENOSKY, AECOM
NEXT STEPS

NJDEP / AECOM UPCOMING ACTIVITIES

- Prepare Meeting Summary for CAG #7
- Continue developing:
  - Concepts and Alternatives
- CAG #8 in March
  - Alternative 1 – Structural Flood Reduction
CAG: CALL TO ACTION

- Submit comments from CAG #7 meeting by February 7, 2017
- Share information from this meeting with friends and neighbors
- Continue to build interest in the Project
- Ensure the public knows about upcoming information (to be posted on Project website)
Critical Information

March, 2017 - TBD
CAG Meeting #8: Alternative 1: Structural Flood Reduction

Project Website
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Question & Answer
THANK YOU!