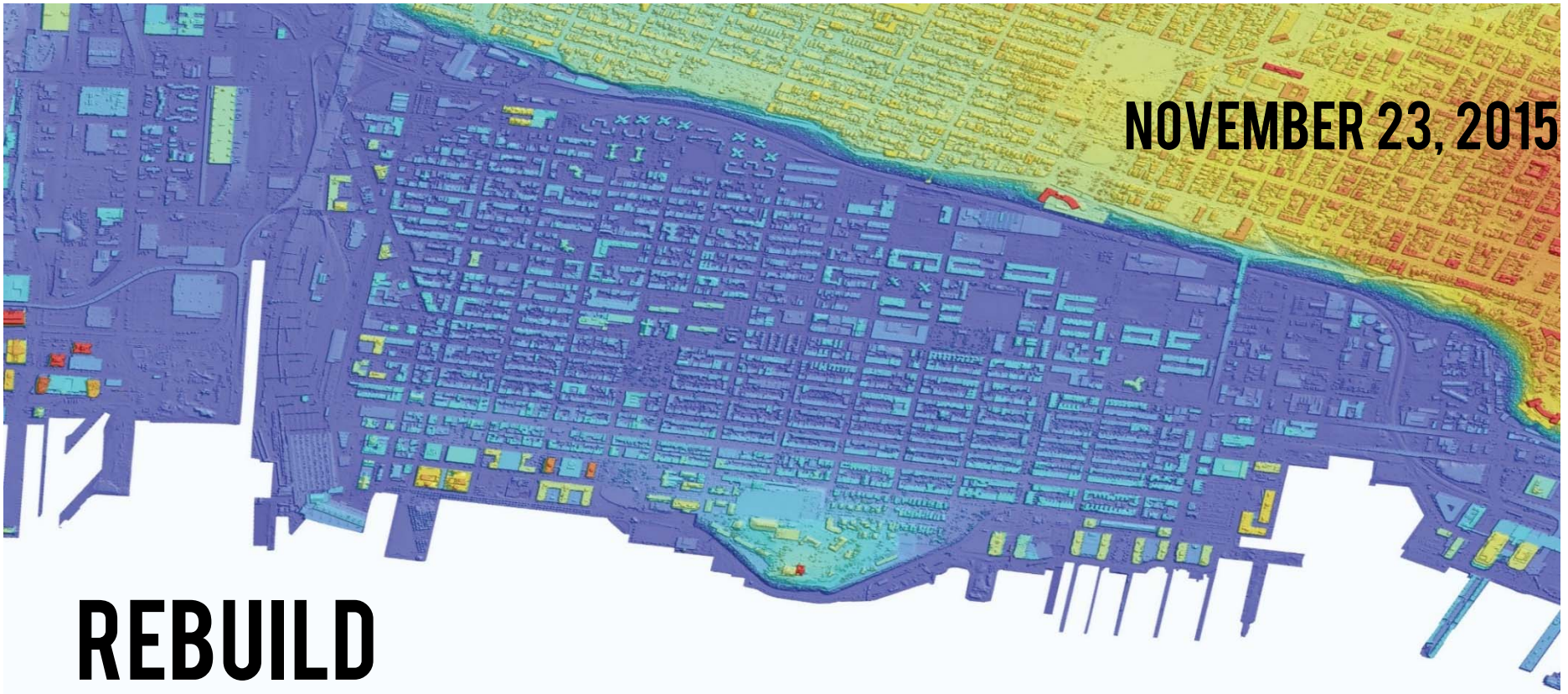


NOVEMBER 23, 2015

REBUILD BY DESIGN

▪ RESIST ▪ DELAY ▪ STORE ▪ DISCHARGE ▪

HUDSON RIVER

Hoboken Weehawken Jersey City | New Jersey

DRAFT FIVE PROJECT CONCEPTS FOR CAG REVIEW

DISCLAIMER

The attached drawings represent five (5) Draft Concepts (A-E) prepared by Dewberry Engineers, Inc. These 5 draft concepts, dated 11/23/15, are currently under review by the Project Citizen Advisory Group (CAG) and other stakeholders in accordance with the Final Citizen Outreach Plan.

These 5 Concepts are not to be considered FINAL.

The next steps are to use the project established Screening Criteria to evaluate the 5 concepts to select three (3) concepts as Build Alternatives. These 3 Build Alternatives will be further analyzed through the feasibility study and Environmental Impact Statement.

CONCEPT A

Lowest impact alignments which still provide substantial flood risk reduction benefits to most residents.

- North Waterfront takes Boathouse into account.
- North Hoboken on-street protection provided along Garden Street until elevation tie-in.
- Hoboken Terminal does not receive flood risk reduction benefits.
- South Waterfront constructed independent of Longslip Canal.
- Permanent movable gates proposed to address flood risk reduction along the underpass.

Legend:

- Gate - Sliding
- Gate - Swinging
- Deployable Flood Wall
- Landscape
- Berm
- Revetment
- Raised Path
- Seawall
- Flood Wall
- T Wall
- Ramp
- Municipal Boundaries
- Study Area
- Ferry Lines
- Preliminary FEMA 100 year Flood Plain

MIN DFE : Approx. Min. FEMA Certification

MAX DFE : Approx. 500 Year + 2075 NOAA SLR

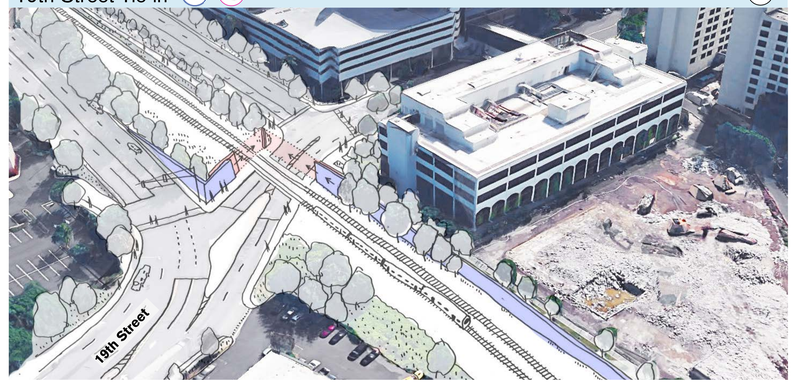
*All DFE's are Approximate and Subject to Change

N

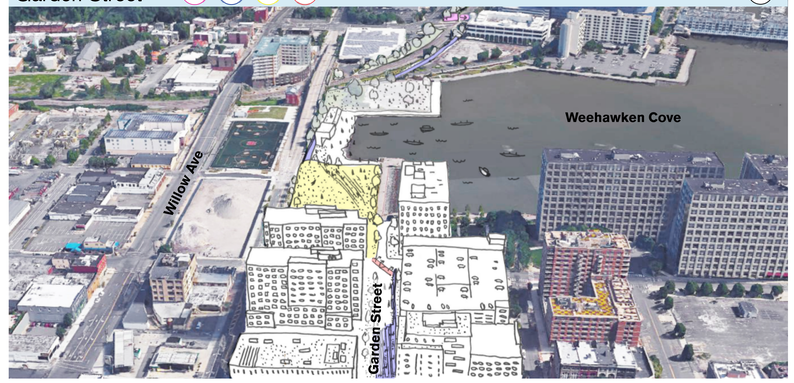
0' 400' 800' 1,600'

State of New Jersey
Department of Environmental Protection

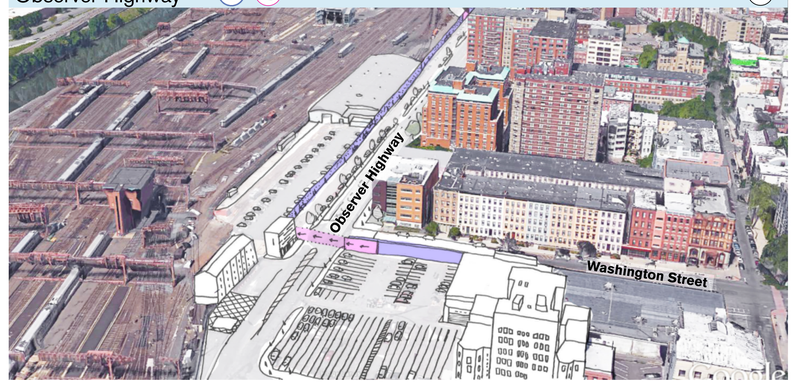
19th Street Tie-in



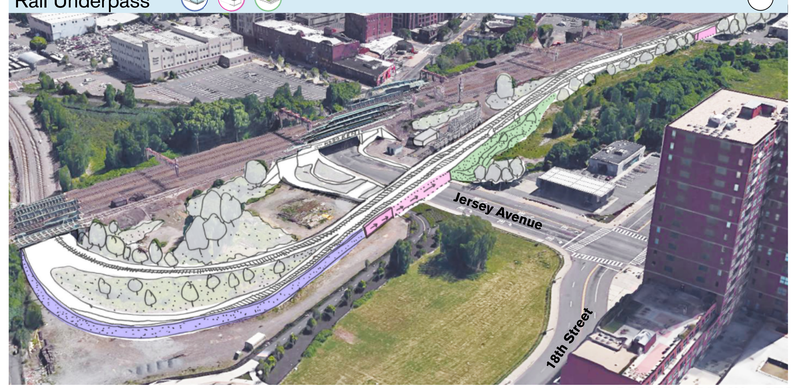
Garden Street



Observer Highway



Rail Underpass



Flood Risk Reduction	
Coastal Storm Surge	
Potential to Adapt to Higher Coastal Flood Event [≥ 500yr and Sea Level Rise]	
Rainfall	
Built Environment	
View Corridors	
Waterfront Access	
Potential Community Benefits	
Connectivity/ Circulation	
Environmental Justice Populations	
Construction/ Maintenance & Operation	
Constructability	
Construction Duration	
Maintenance and Operation for Overall System	
Environmental Impacts	
Hazardous Waste	
Wetlands	
Essential Fish Habitat	
Threatened and Endangered Species	
Army Corp. Permits	
Historic Properties	
Archaeological Resources	
Benefit/Cost Analysis	
Benefits	
Costs	
Benefit/Cost Ratio	

▪ RESIST ▪ DELAY ▪ STORE ▪ DISCHARGE ▪

CONCEPT B

Moderate impact alignments which give Weehawken and the North Waterfront substantial flood risk reduction benefits.

- Weehawken tie-in at Lincoln Tunnel.
- Permanent built structures on North Waterfront provide flood risk reduction benefits.
- Hoboken Terminal does not receive flood risk reduction benefits.
- South Waterfront constructed independent of Longslip Canal.
- Permanent movable gates proposed to address flood risk reduction along the underpass.

Legend:

- Gate - Sliding
- Gate - Swinging
- Deployable Flood Wall
- Landscape
- Berm
- Revetment
- Raised Path
- Seawall
- Flood Wall
- T Wall
- Ramp
- Municipal Boundaries
- Study Area
- Ferry Lines
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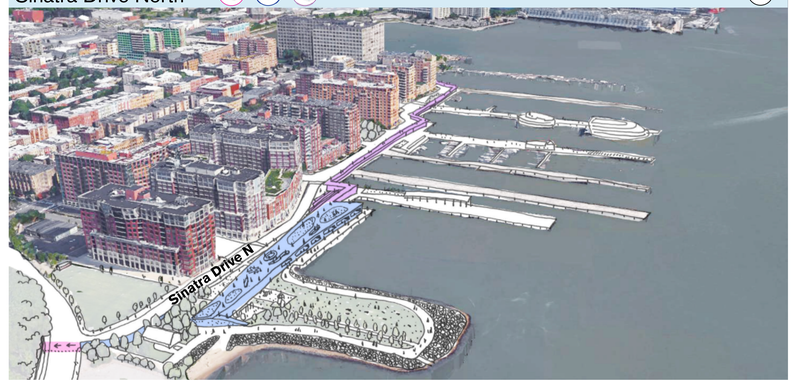
N

0' 400' 800' 1,600'

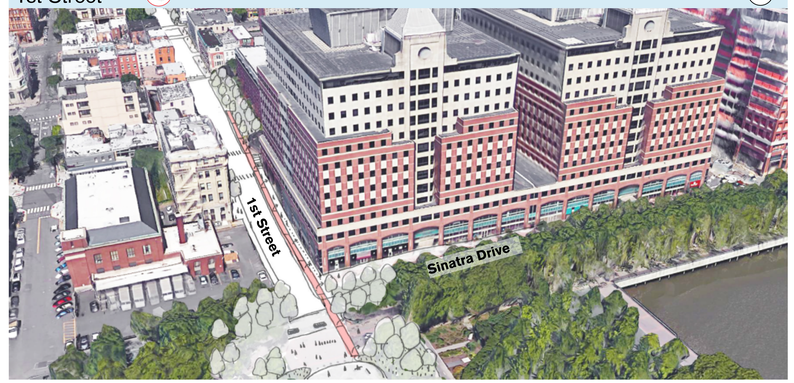
State of New Jersey
Department of Environmental Protection

Weehawken Cove

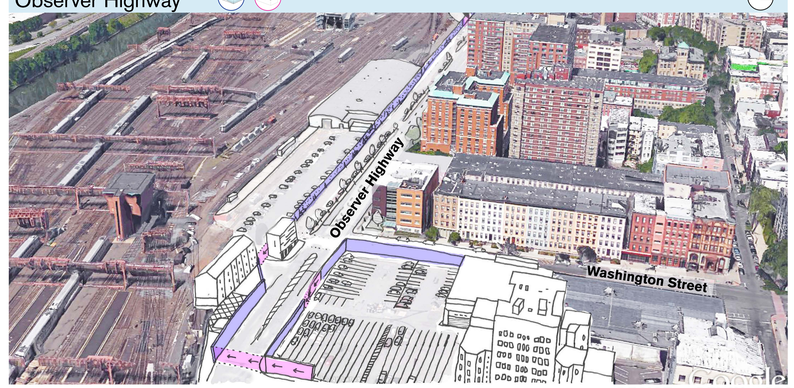
Sinatra Drive North



1st Street



Observer Highway



Flood Risk Reduction	
Coastal Storm Surge	
Potential to Adapt to Higher Coastal Flood Event [≥ 500yr and Sea Level Rise]	
Rainfall	
Built Environment	
View Corridors	
Waterfront Access	
Potential Community Benefits	
Connectivity/ Circulation	
Environmental Justice Populations	
Construction/ Maintenance & Operation	
Constructability	
Construction Duration	
Maintenance and Operation for Overall System	
Environmental Impacts	
Hazardous Waste	
Wetlands	
Essential Fish Habitat	
Threatened and Endangered Species	
Army Corp. Permits	
Historic Properties	
Archaeological Resources	
Benefit/Cost Analysis	
Benefits	
Costs	
Benefit/Cost Ratio	

CONCEPT C

Maximum impact alignments which offer flood risk reduction benefits to Weehawken, N/S Waterfront, and Hoboken Terminal.

- An in-water revetment is planned in Weehawken Cove, and to the North a Lincoln Tunnel tie-in.
- Permanent built structures on North Waterfront provide flood risk reduction benefits.
- Programmed Bulkheads offer added community benefits, while providing flood risk reduction benefits to those on the water.
- South Waterfront constructed assuming the proposed construction of the Longslip Canal project.
- Hoboken Terminal does receive flood risk reduction benefits; resist portion is planned in-water in front of the Terminal.
- Permanent movable gates proposed to address flood risk reduction along the underpass.

Legend:

- Gate - Sliding
- Gate - Swinging
- Deployable Flood Wall
- Landscape
- Berm
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- Raised Path
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- T Wall
- Ramp
- Municipal Boundaries
- Study Area
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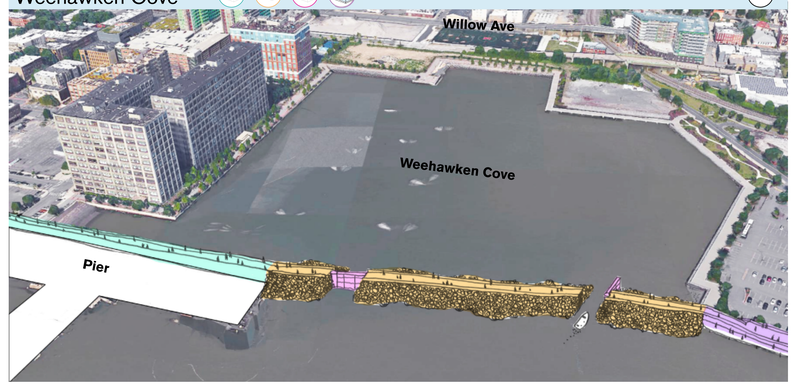
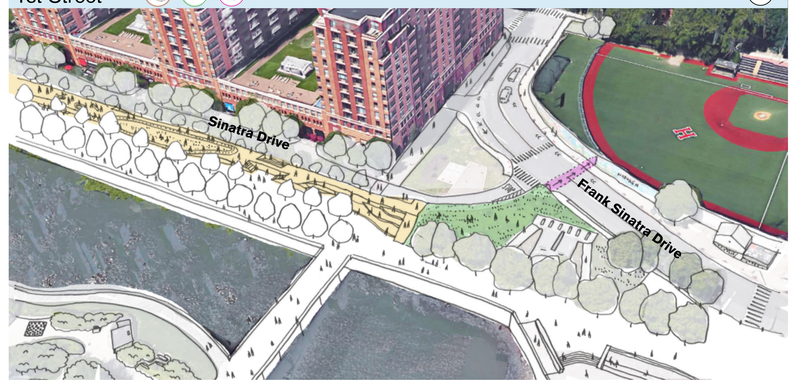
State of New Jersey
Department of Environmental Protection

Weehawken Cove

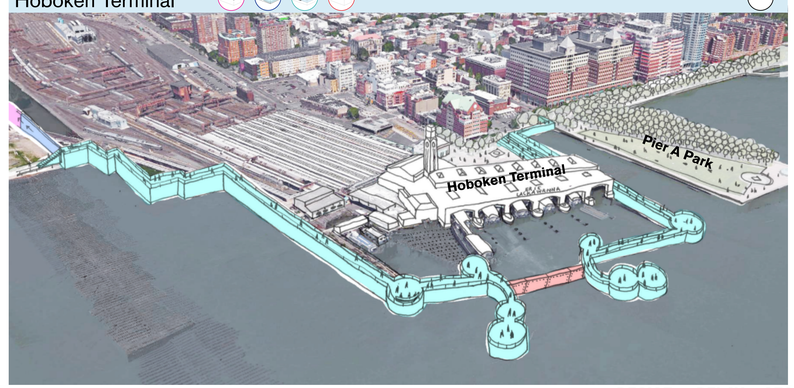


Sinatra Drive North

1st Street



Hoboken Terminal



Flood Risk Reduction	
Coastal Storm Surge	
Potential to Adapt to Higher Coastal Flood Event [≥ 500yr and Sea Level Rise]	
Rainfall	
Built Environment	
View Corridors	
Waterfront Access	
Potential Community Benefits	
Connectivity/ Circulation	
Environmental Justice Populations	
Construction/ Maintenance & Operation	
Constructability	
Construction Duration	
Maintenance and Operation for Overall System	
Environmental Impacts	
Hazardous Waste	
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Essential Fish Habitat	
Threatened and Endangered Species	
Army Corp. Permits	
Historic Properties	
Archaeological Resources	
Benefit/Cost Analysis	
Benefits	
Costs	
Benefit/Cost Ratio	

CONCEPT D

High impact alignments which offer flood risk reduction benefits to Weehawken, N/S Waterfront, and Hoboken Terminal.

- North Resist portion offers Lincoln Tunnel Tie-In.
- Permanent built structures on North Waterfront provide flood risk reduction benefits.
- Programmed Bulkheads offer added community benefits, while providing flood risk reduction benefits to those on the water.
- South Waterfront constructed assuming the proposed construction of the Longslip Canal project.
- Alignment goes through Hoboken Terminal, offering flood risk reduction benefits to essential electrical and utility assets (allows for continued operations in the case of an event).
- Permanent movable gates proposed to address flood risk reduction along the underpass.

Legend:

- Gate - Sliding
- Gate - Swinging
- Deployable Flood Wall
- Landscape
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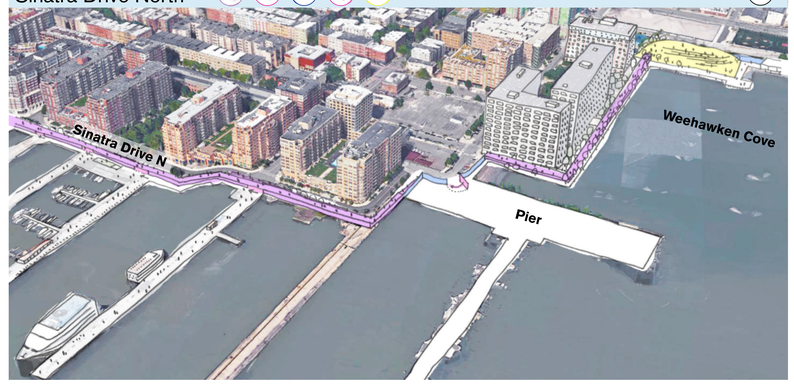
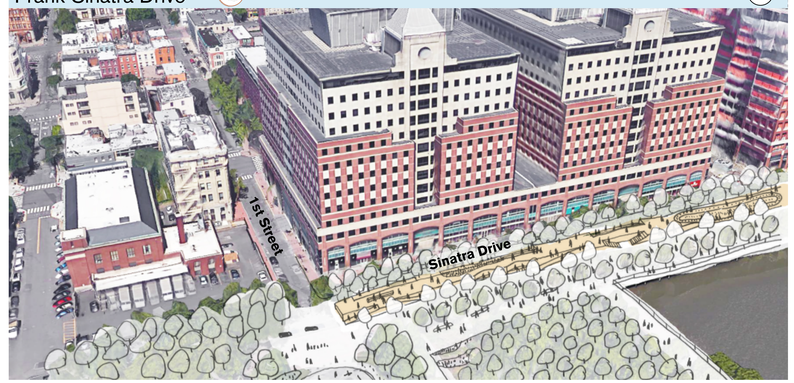
State of New Jersey
Department of Environmental Protection

Weehawken Waterfront

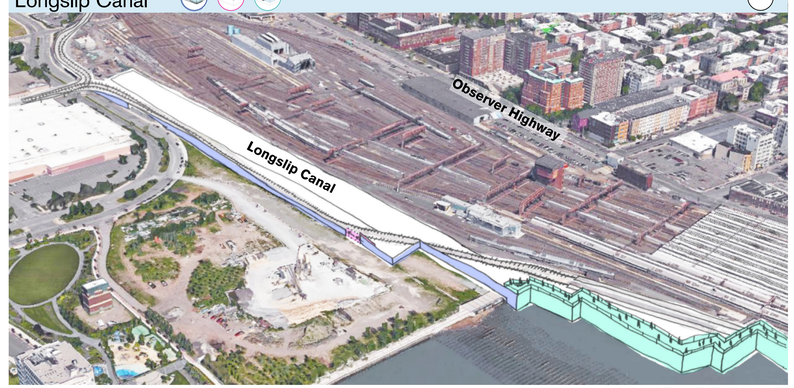
Sinatra Drive North



Frank Sinatra Drive



Longslip Canal



Flood Risk Reduction	
Coastal Storm Surge	
Potential to Adapt to Higher Coastal Flood Event [≥ 500yr and Sea Level Rise]	
Rainfall	
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Costs	
Benefit/Cost Ratio	

CONCEPT E

Moderate impact alignments which offer partial flood risk reduction benefits to North waterfront and full benefits to South Waterfront.

- North Waterfront takes Boathouse into account.
- North Hoboken on-street protection provided along Hudson Blvd (Option 1) and Shipyard Lane (Option 2) until elevation tie-in.
- Some programmed bulkhead and other resist structures proposed along South Waterfront.
- Permanent movable gates proposed to address flood risk reduction along the underpass.

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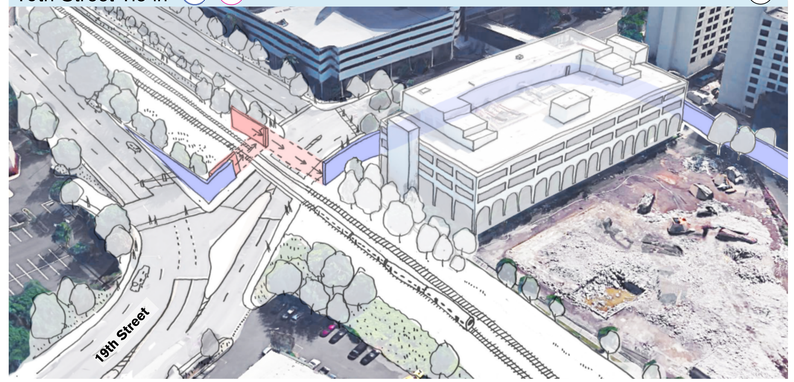
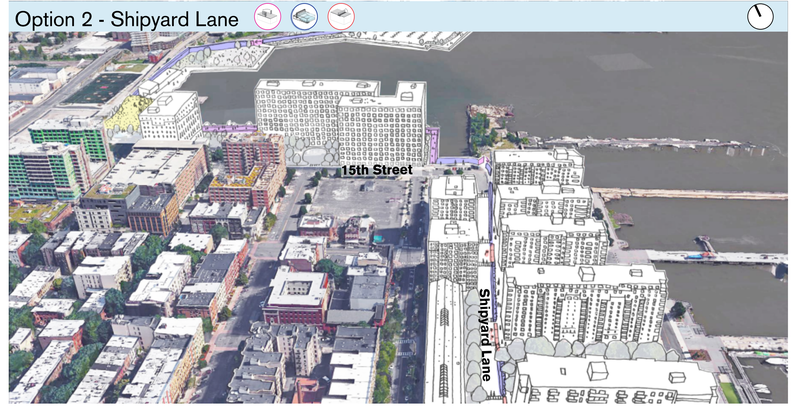
19th Street Tie-in

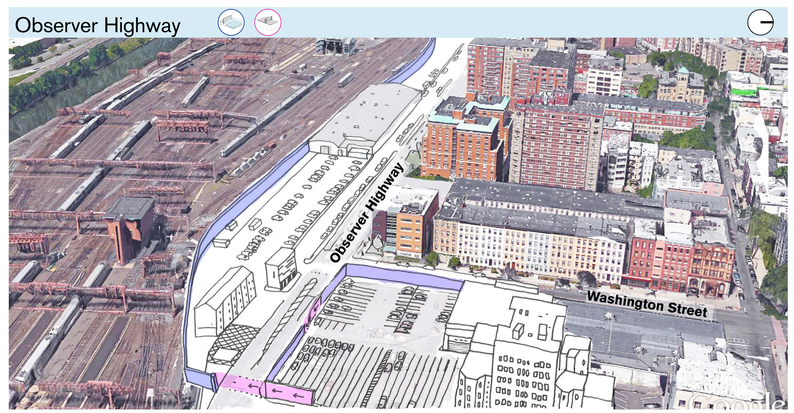


Option 1 - Hudson Street

Option 2 - Shipyard Lane



Observer Highway



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Benefit/Cost Ratio	

DELAY
STORE
DISCHARGE

- Aim to maximize the potential to capture, store, infiltrate, evaporate and release of stormwater (STORE + DELAY + DISCHARGE)
- Look to achieve community co-benefits while improving management of stormwater that could reduce rainfall flooding.
- With the exception of the BASF site, all stormwater management strategies are entirely on publicly-owned land.
- Use both “green” and “grey” stormwater management strategies.
- Consider physical, environmental and infrastructure constraints in locating and designing specific interventions.

Legend:

- Delay + Store - Parks
- Water Storage Sites
- Catchment Area
- Outfall Pipe
- Storm Sewer Pipe
- Hybrid Tank
- Tank
- Tank Bumpout
- Ongoing Projects
- Existing Flooding “Hotspot”
- Municipal Boundaries
- Study Area
- Ferry Lines

N

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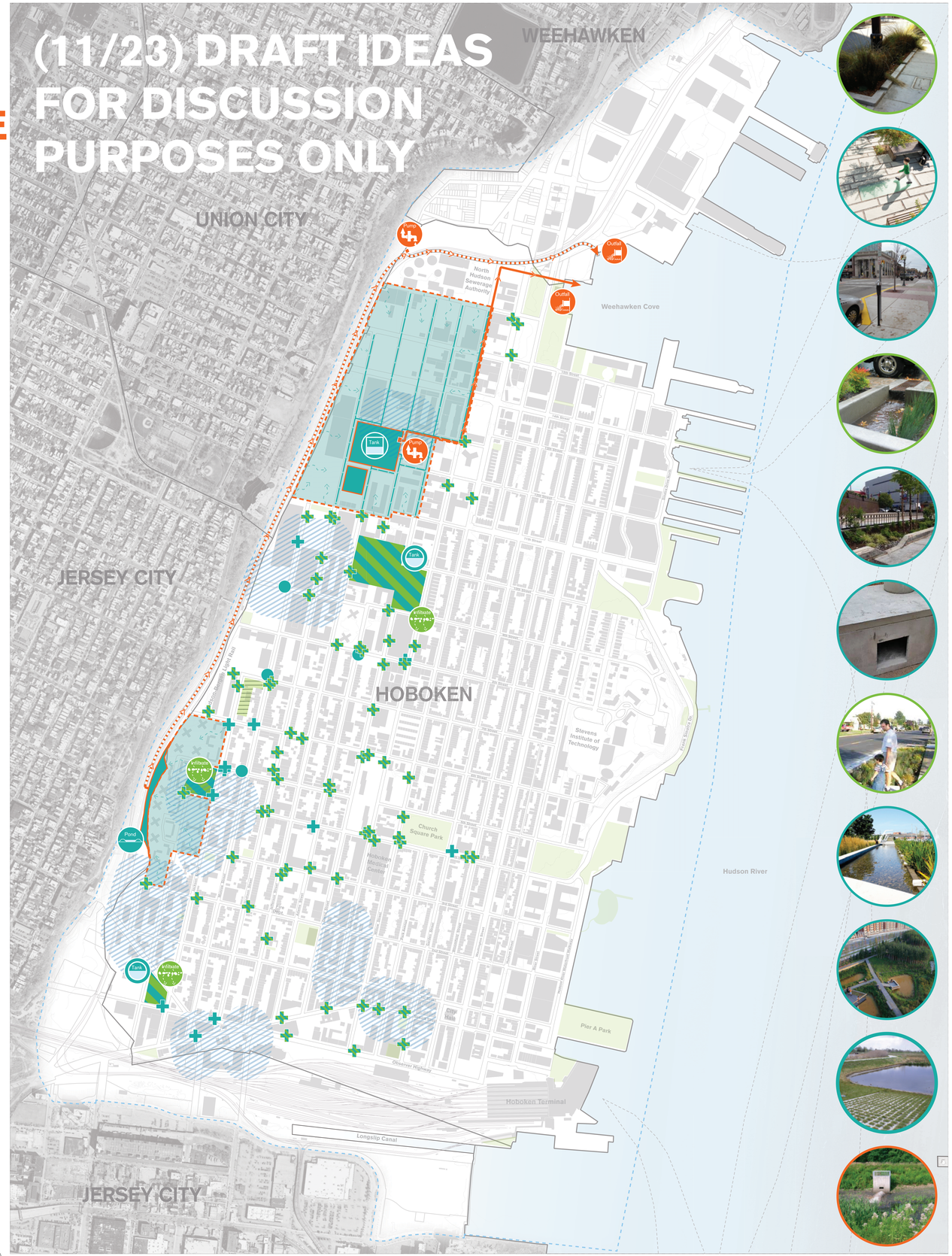
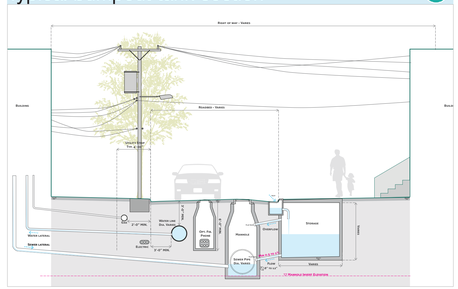
State of New Jersey
Department of Environmental Protection

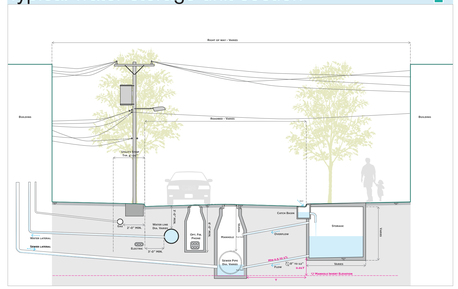
(11/23) DRAFT IDEAS FOR DISCUSSION PURPOSES ONLY



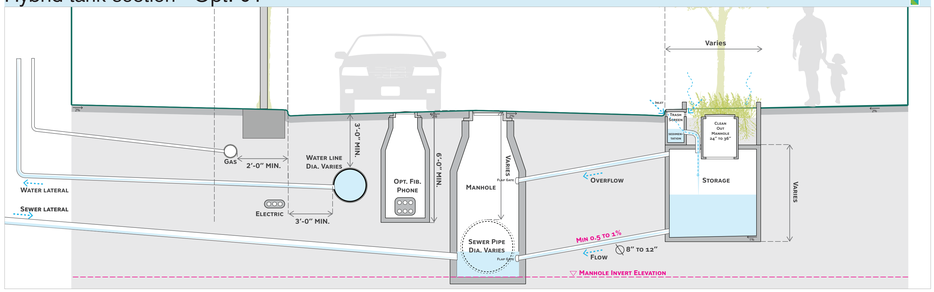
Typical bumpout tank section



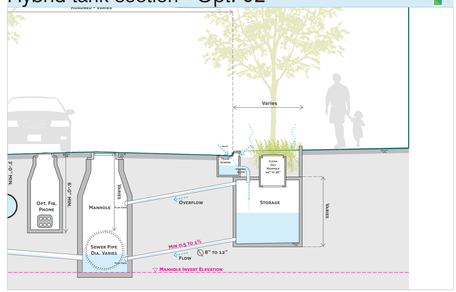
Typical water storage unit section



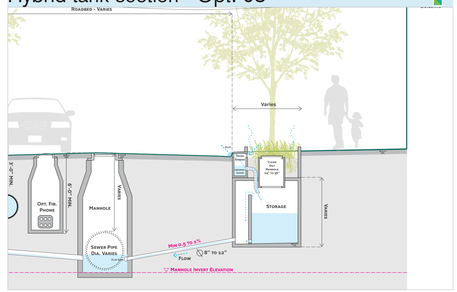
Hybrid tank section - Opt. 01



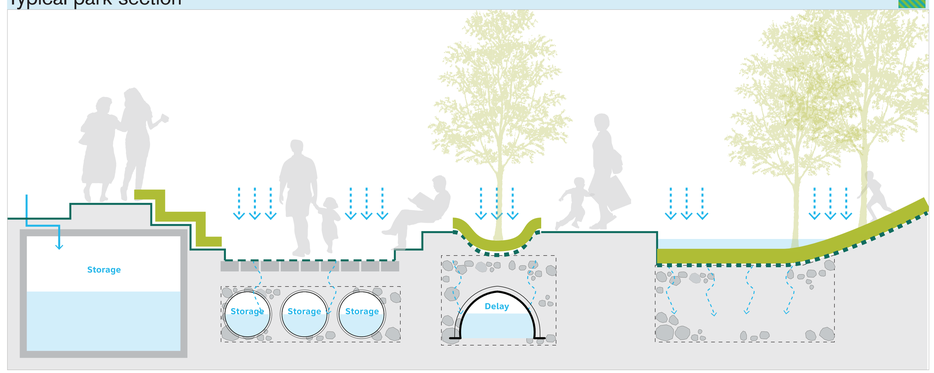
Hybrid tank section - Opt. 02



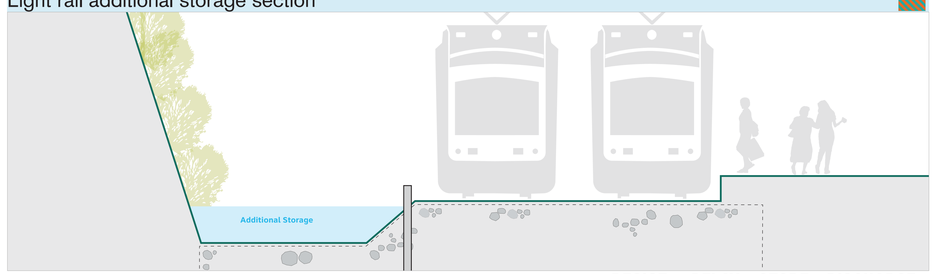
Hybrid tank section - Opt. 03



Typical park section



Light rail additional storage section



▪ RESIST ▪ DELAY ▪ STORE ▪ DISCHARGE ▪