

Hunts Point **RESILIENCY**

Public Meeting

June 20, 2017



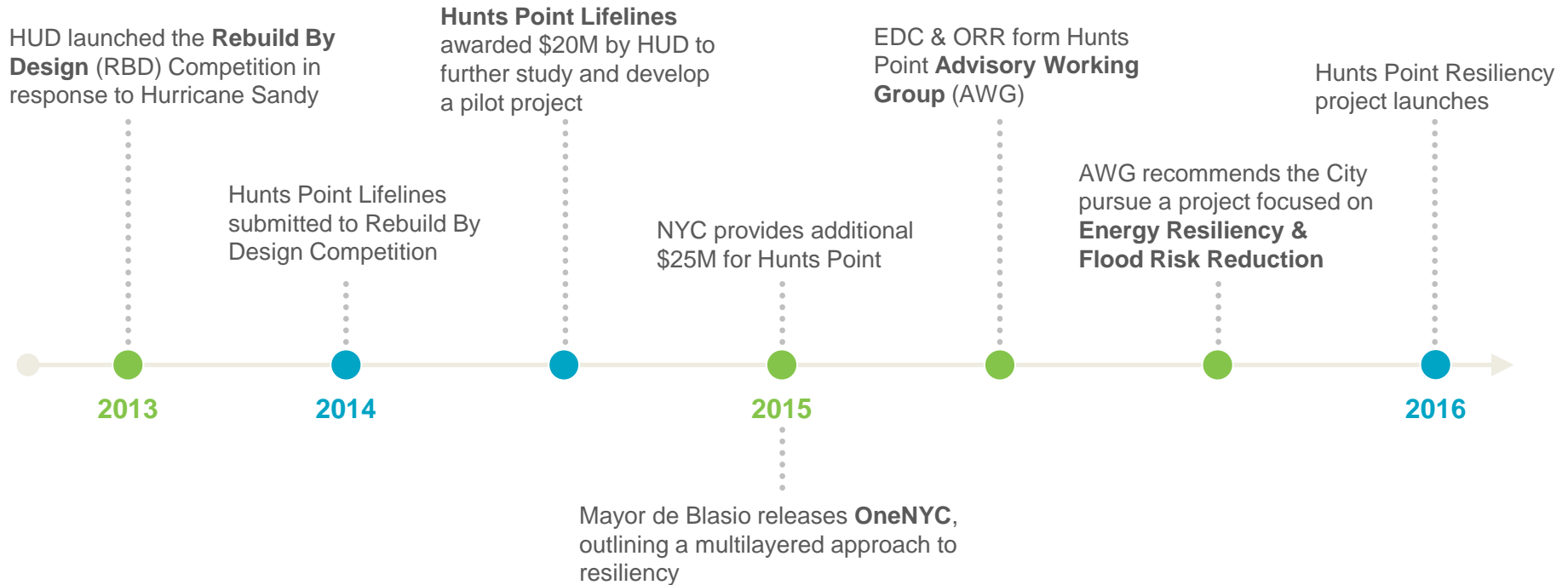
Agenda

- Hunts Point Resiliency Project Background & Overview
- Recap of Flood Risk & Vulnerability Assessment Findings
- Flood Risk Reduction Project Approaches: Identification & Evaluation
- Parallel Resiliency & Sustainability Initiatives
- Benefit Cost Analysis
- Flood Risk Reduction Feasibility Assessment Findings
- Stakeholder Engagement

How We Got Here

Project Beginnings

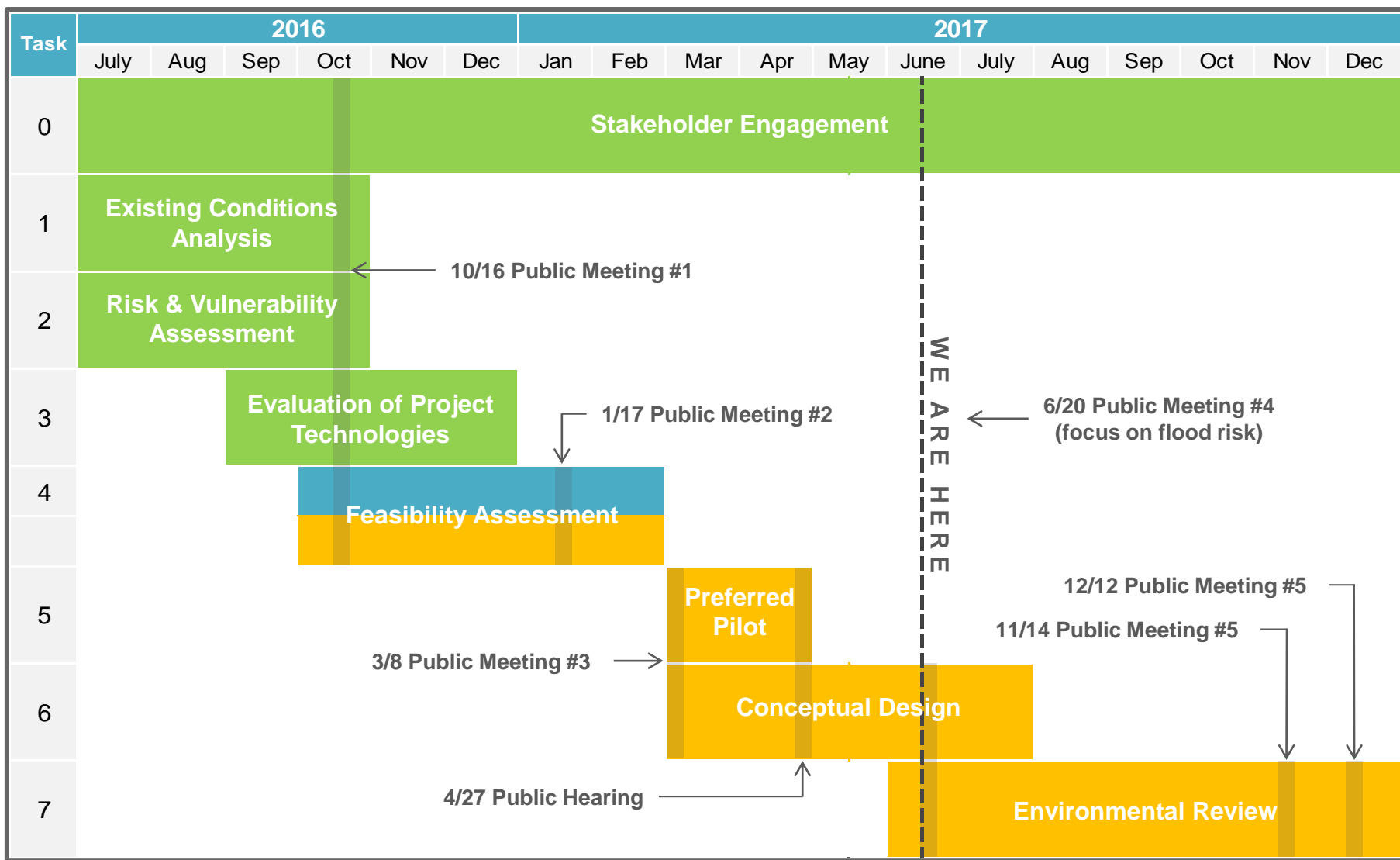
- Awarded RBD funding → Aligned with the community's vision → Commenced Project



Project Scope of Work

Task	Subtasks	Flood Risk Reduction	Energy Resiliency
<u>Task 0</u> : Ongoing Stakeholder Engagement	Stakeholder Engagement	X	X
<u>Task 1</u> : Existing Conditions Analysis	1.1 Study Area Conditions 1.2 Mapping	X	X
<u>Task 2</u> : Risk & Vulnerability Assessment	Risk & Vulnerability Assessment	X	X
<u>Task 3</u> : Identification & Preliminary Evaluation of Project Options	3.1 Initial Identification of Project Options 3.2 Feasibility Screening Methodology 3.3 Feasibility Screening	X	X
WE ARE HERE <u>Task 4</u> : Feasibility Assessment & Analysis	Feasibility Assessment & Analysis	X	X
<u>Task 5</u> : Preferred Energy Resiliency Pilot Project	Preferred Energy Resiliency Pilot Project		X
<u>Task 6</u> : Conceptual Design & Environmental Review For Pilot Project	6.1 Conceptual Design 6.2 Implementation Plan 6.3 Cost/Benefit Analysis 6.4 Identify Required Environmental Review		X
<u>Task 7</u> : Environmental Review	Environmental Review		X

Project Timeline



Key Definitions

- **Coastal Storm Surge:** An abnormal rise of water generated by a storm, as a result of atmospheric pressure changes and wind (*New York Times, 2017*)
- **2050's Sea Level Rise:** Expected 2.5 feet increase in sea levels as a result of regional land subsidence, expansion of warming ocean waters, and melting of global ice (*NPCC, 2015*)
- **Vulnerability:** The inability of a building/structure, system or population to withstand the consequences of a threat to which it is exposed
- **100-year Floodplain:** Area that has a 1% chance of flooding in any given year (*New York Times, 2017*)
- **Preliminary Flood Insurance Rate Maps (PFIRMs):** Maps produced by FEMA used as the go-to source for information on special flood hazard areas and base flood elevations (*New York Times, 2017*)
- **Base Flood Elevation:** The height of flooding that might be expected in a 100-year flood (*New York Times, 2017*)

See others for specific Flood Risk Reduction Options later in presentation.

Recap of Vulnerability Assessment Findings

Coastal Vulnerabilities

- One goal of this study is to address critical vulnerabilities for both community and industry in Hunts Point. Vulnerability assessment results suggest that:
 - Building-level power outages are a significant and shared threat to residents and businesses in Hunts Point.
 - Due to considerable elevation change, the low-lying areas face significant threats from coastal flooding while the upland residential area does not.
 - Extreme rain/snow storms are not a major threat in Hunts Point.
 - The number of community organizations and history of organizing in Hunts Point can lay the foundation for strong social resiliency.

Coastal Storm Surge Vulnerability Findings

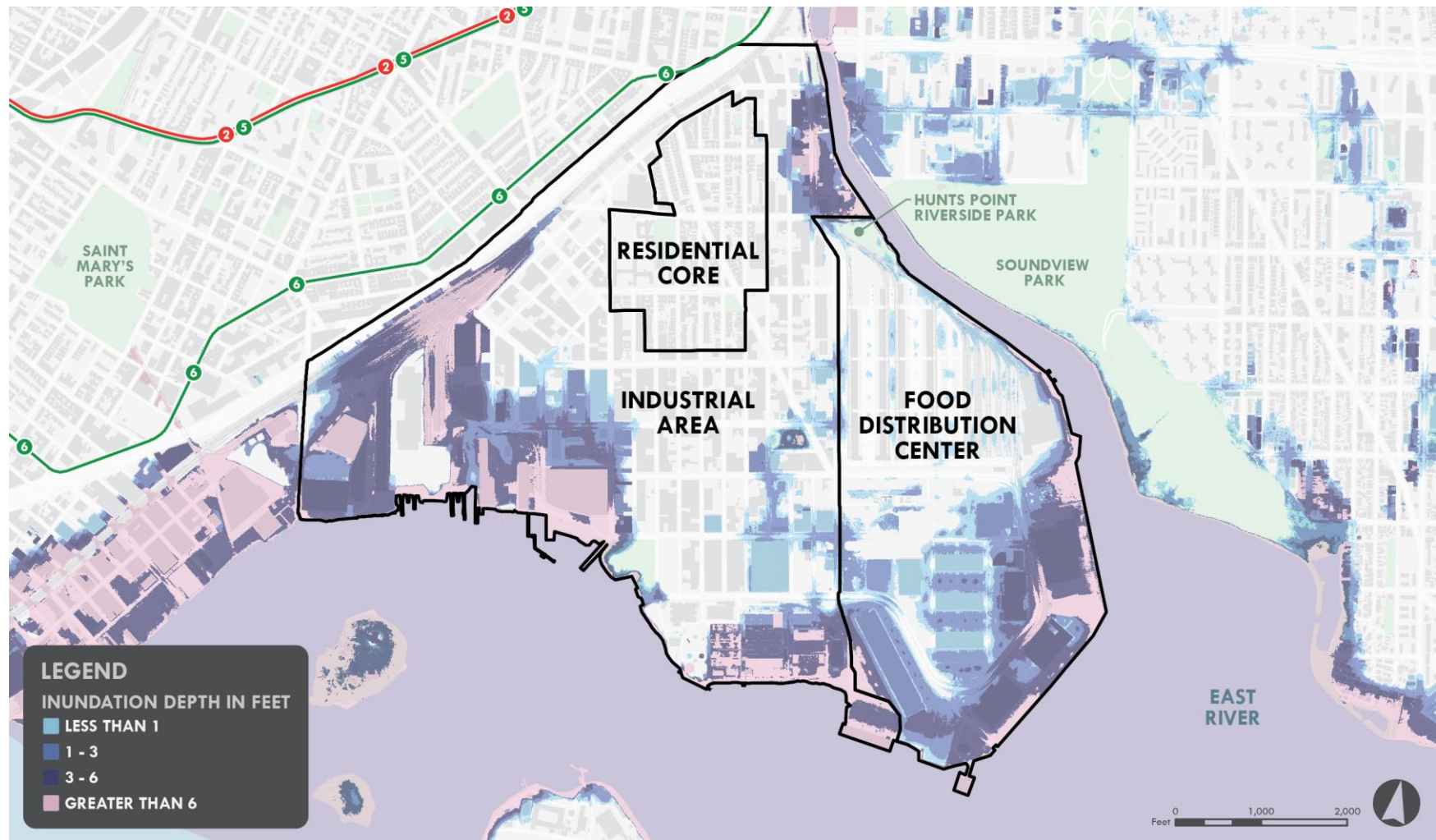
- Key assessment findings:
 - Upland residential areas do not face significant threats from surge
 - Low-lying industrial and commercial areas face significant threats from coastal flooding

Coastal Storm Surge Vulnerability Findings

- Facilities identified as most vulnerable to future surge threats based on:
 - Low-lying site or facility
 - Number of people (employees, for example) affected
 - Potential mid- to long-term damage to electrical equipment
 - Perishable goods and cost of inventory that could be damaged

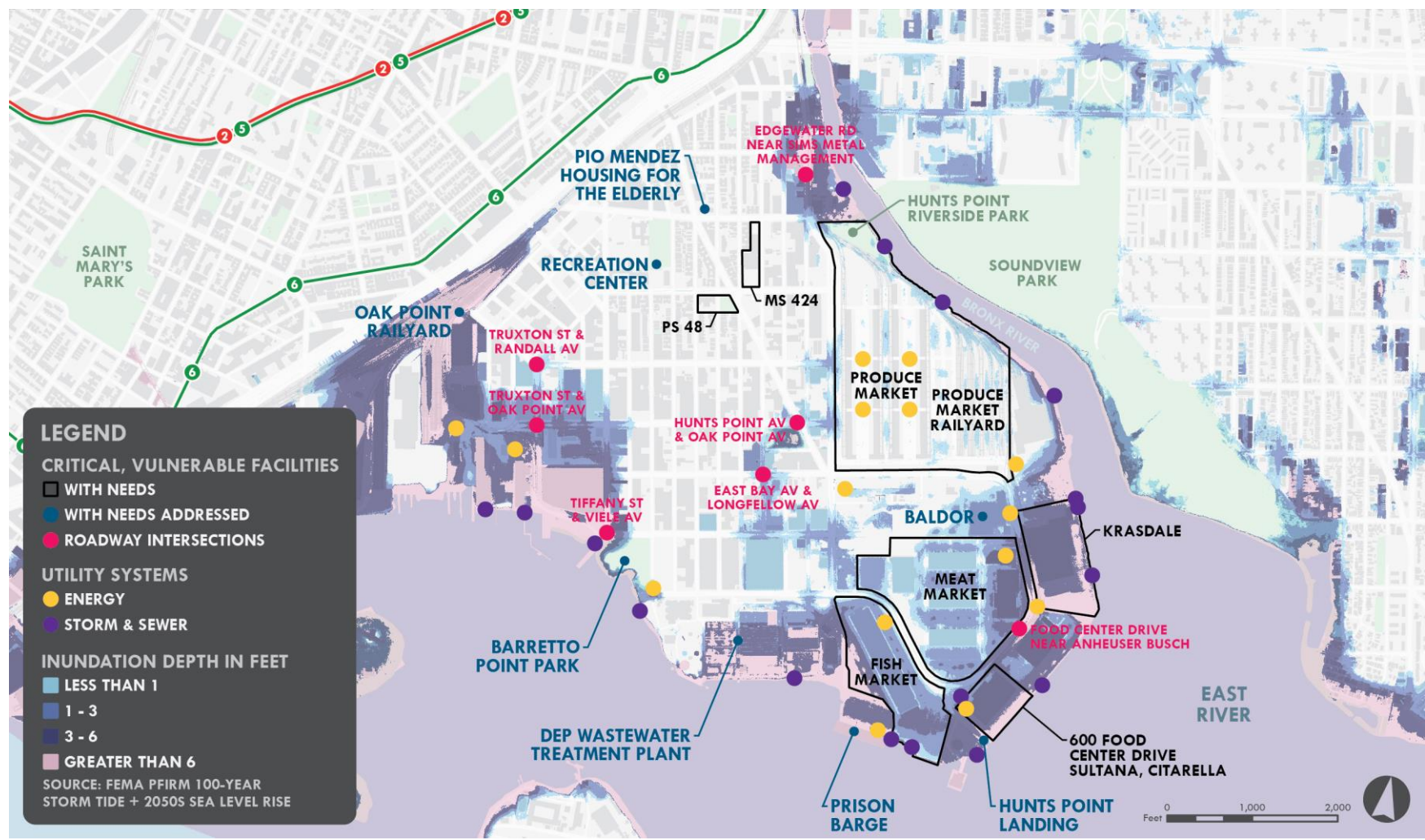
Coastal Storm Surge Vulnerability Findings

FEMA PFIRM + 2050 Sea Level Rise on Hunts Point



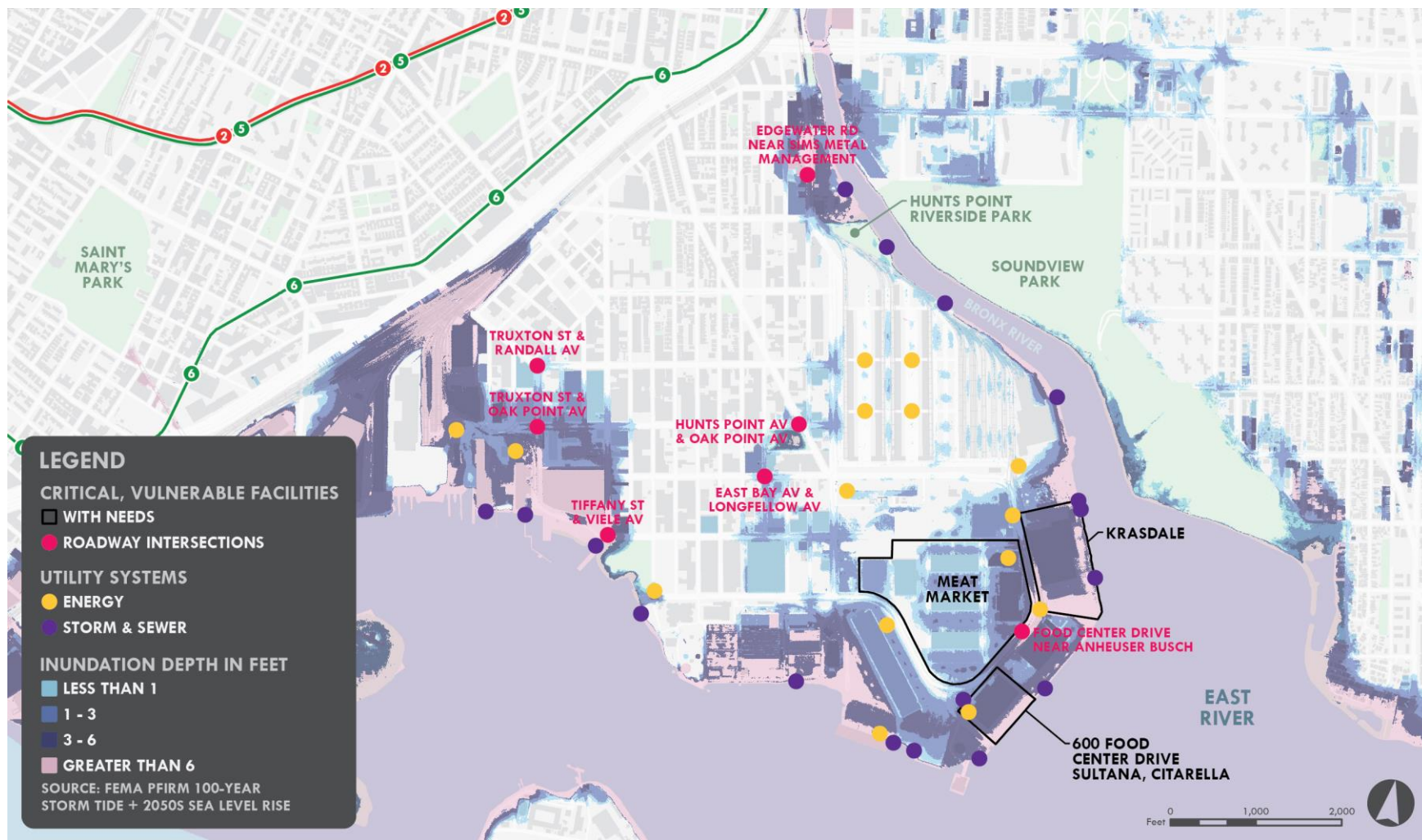
Coastal Storm Surge Vulnerability Findings

Critical Facilities and Storm Surge on Hunts Point



Coastal Storm Surge Vulnerability Findings

Critical Facilities Most Vulnerable to Storm Surge on Hunts Point



Coastal Storm Surge Vulnerability Findings

- Critical facilities potentially vulnerable to future surge threats:
 - Meat Market
 - Low-lying, number of employees, potential damage to electrical equipment, perishable goods and cost of inventory damages
 - 600 Food Center Drive (Citarella/Sultana)
 - Low-lying, potential damage to electrical equipment, perishable goods and cost of inventory damages
 - Krasdale
 - Low-lying, number of employees, potential damage to electrical equipment, cost of inventory damages

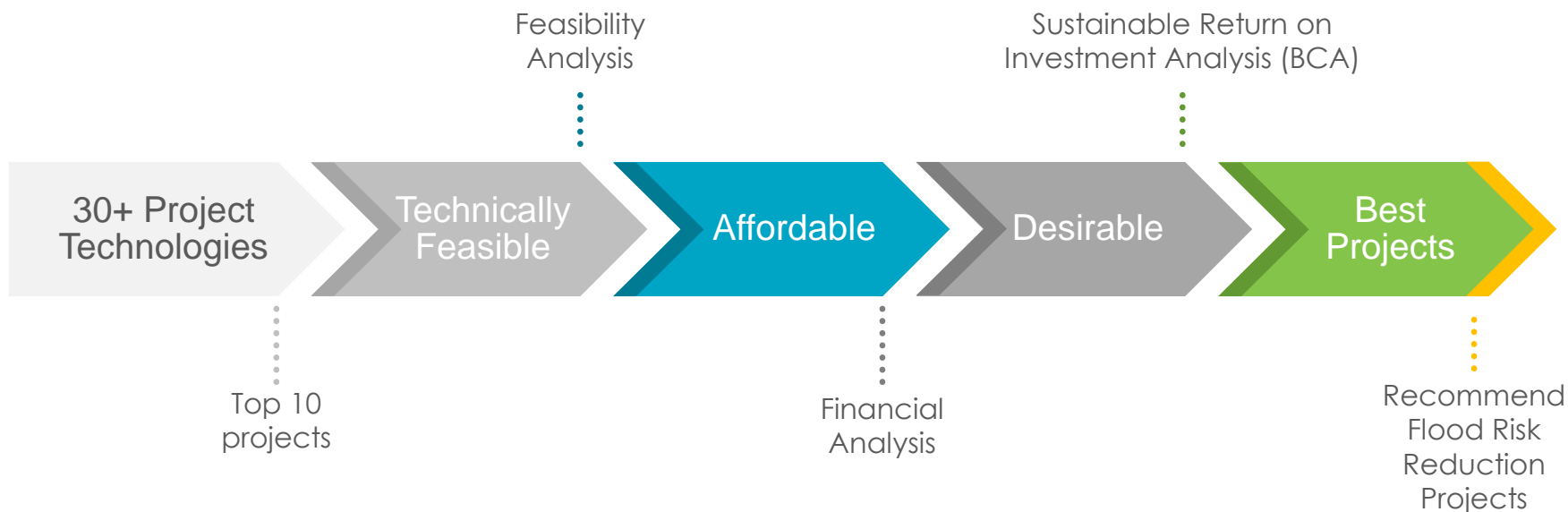
Coastal Storm Surge Vulnerability Findings

- Other facilities were considered to be not vulnerable if:
 - No residents would be affected
 - Few employees would be affected
 - Located at higher elevations
 - Operations occur at higher elevations within building (for example, elevated loading bays or inventory stored on second floor)
 - Inventory or product sold on daily basis (none stored onsite and none at risk of loss or damage)
 - Damage to electrical equipment/systems not expected

Flood Risk Reduction Project Approaches: Identification & Evaluation



Hunts Point Resiliency Assessment & Analysis



Screening Criteria (adapted from Lifelines)

Resiliency: protect against coastal storm surge, proven technology, operational during emergency conditions

Sustainability: ecological improvements, green infrastructure, stormwater management

Community benefits: workforce opportunity, scalability, multi-purpose

Constructability: suitable space, permitting

Implementability: schedule, cost, potential to secure funding

Coastal Storm Surge Protection Approaches

Screening potential approaches

Top reasons why retained:

1. Reliable
2. Scalable
3. Permitting Ability

Top reasons why screened out:

1. Space Availability
2. Elevations
3. Cost Prohibitive

- **Hardening**
- **Area-wide Floodwall**
- **Facility-level Floodwall**
- **Elevate Building**
- **Elevate Critical Equipment**

- Area-wide Levees
- Deployable Flood Barriers
- Deployable Pumps

Project Approaches

3 feasible approaches:

- **Approach 1:** Area Wide Floodwall
- **Approach 2:** Elevate Buildings at Meat Market
- **Approach 3:** Hardening at Meat Market, Krasdale and 600 Food Center Drive

All approaches considered technically feasible because:

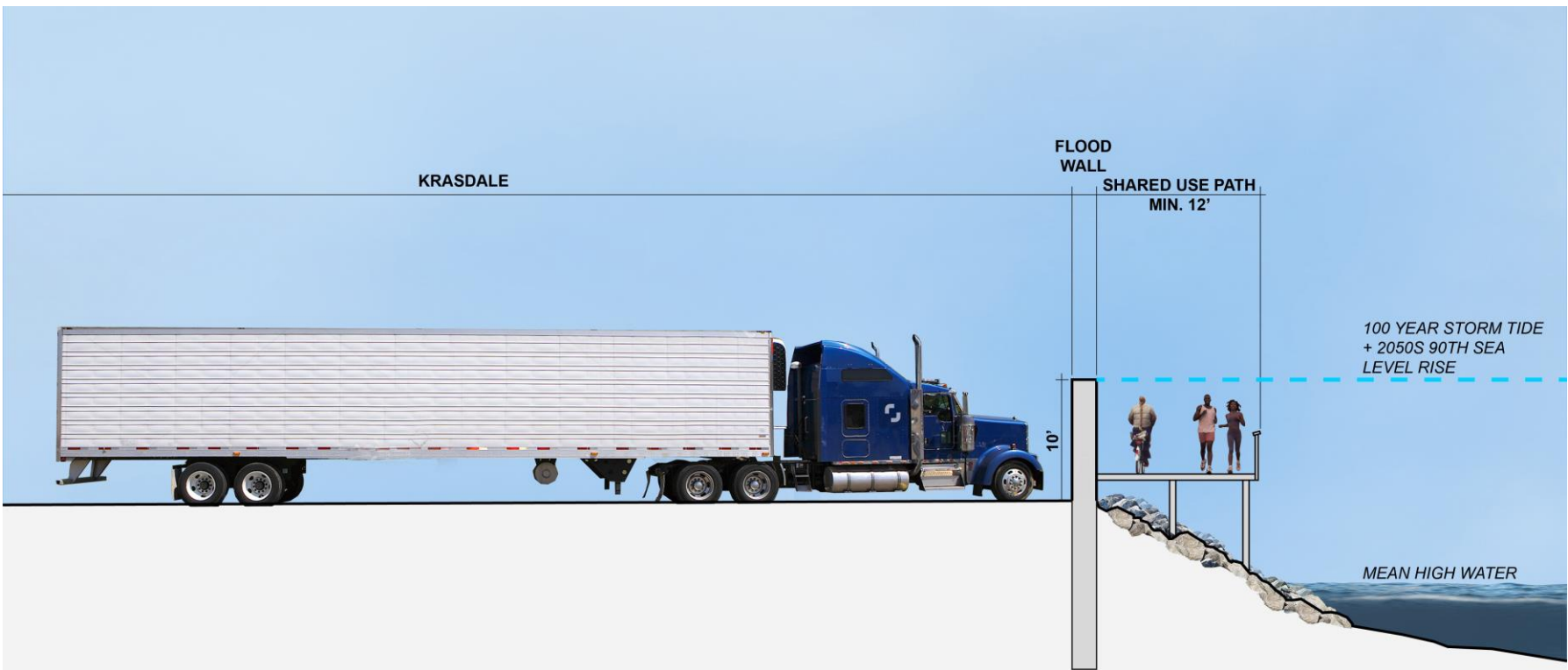
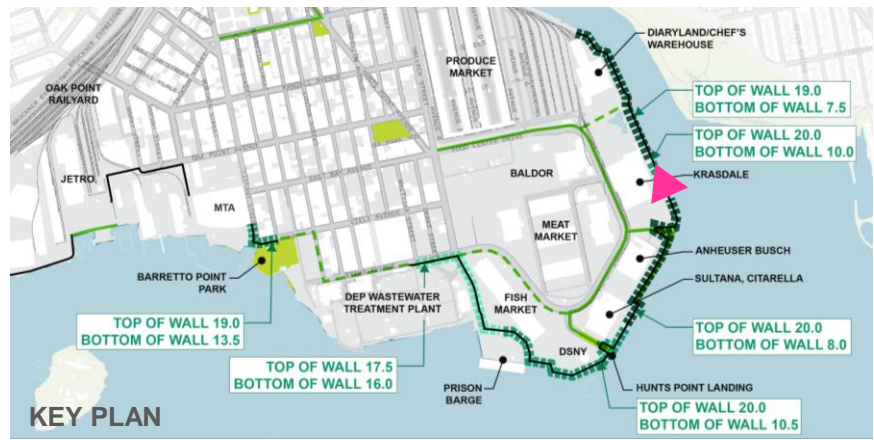
- **Benefit-Cost Ratio Greater than 1**
- **Reliable**
- **Scalable**
- **Acceptable by Permitting/Approval Agencies**

Approach 1 – Area Wide Floodwall

- **Area Wide Floodwall:** A permanent, hard structure along waterfront, where feasible, to achieve a specified level of protection
- Different designs and configurations along waterfront are required due to existing conditions
- The wall elevation will be the same through the length, but the actual height as viewed from the ground may appear to change given changes in elevation

Approach 1 – Area Wide Floodwall

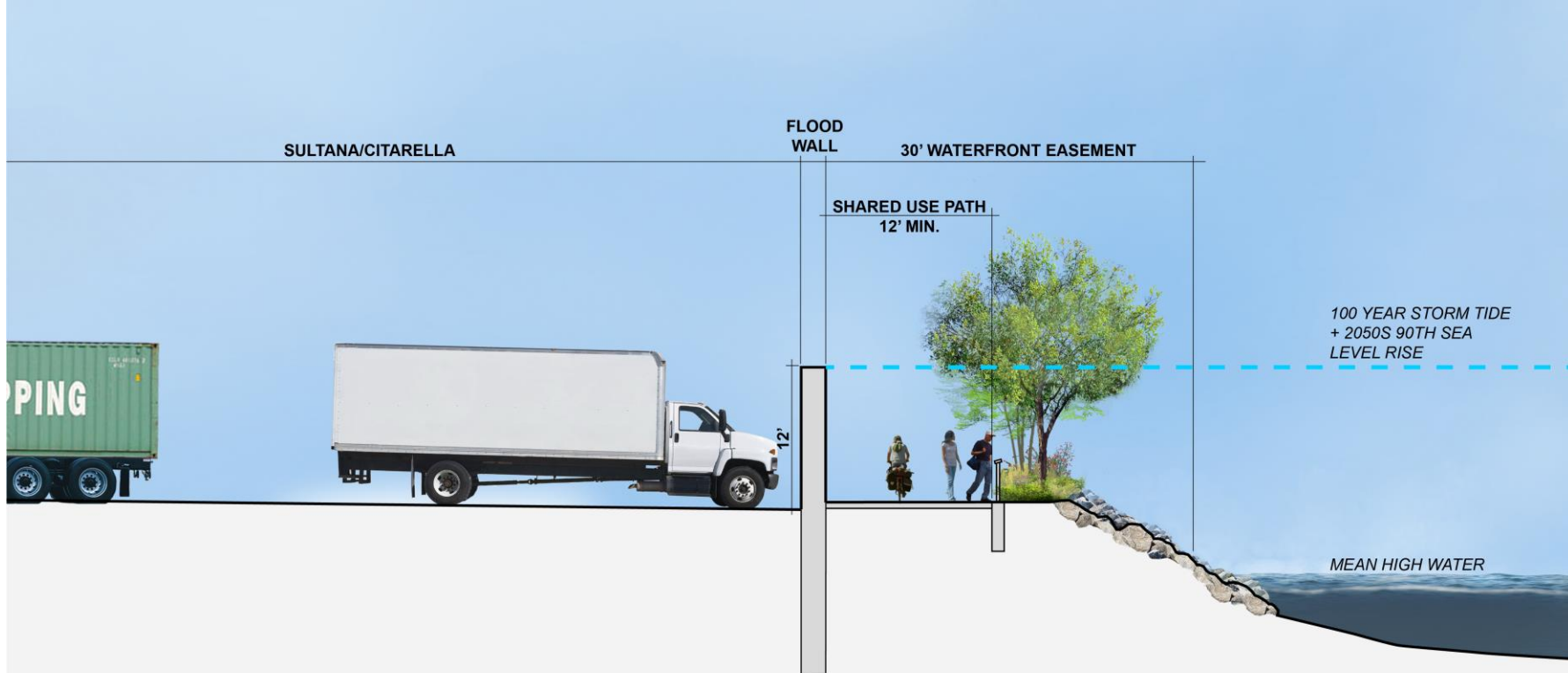
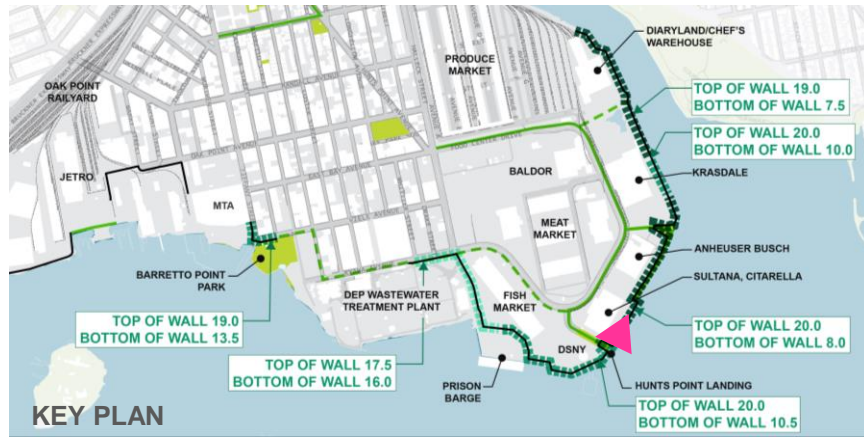
Example of floodwall with
cantilever at Krasdale



Approach 1 – Area Wide Floodwall

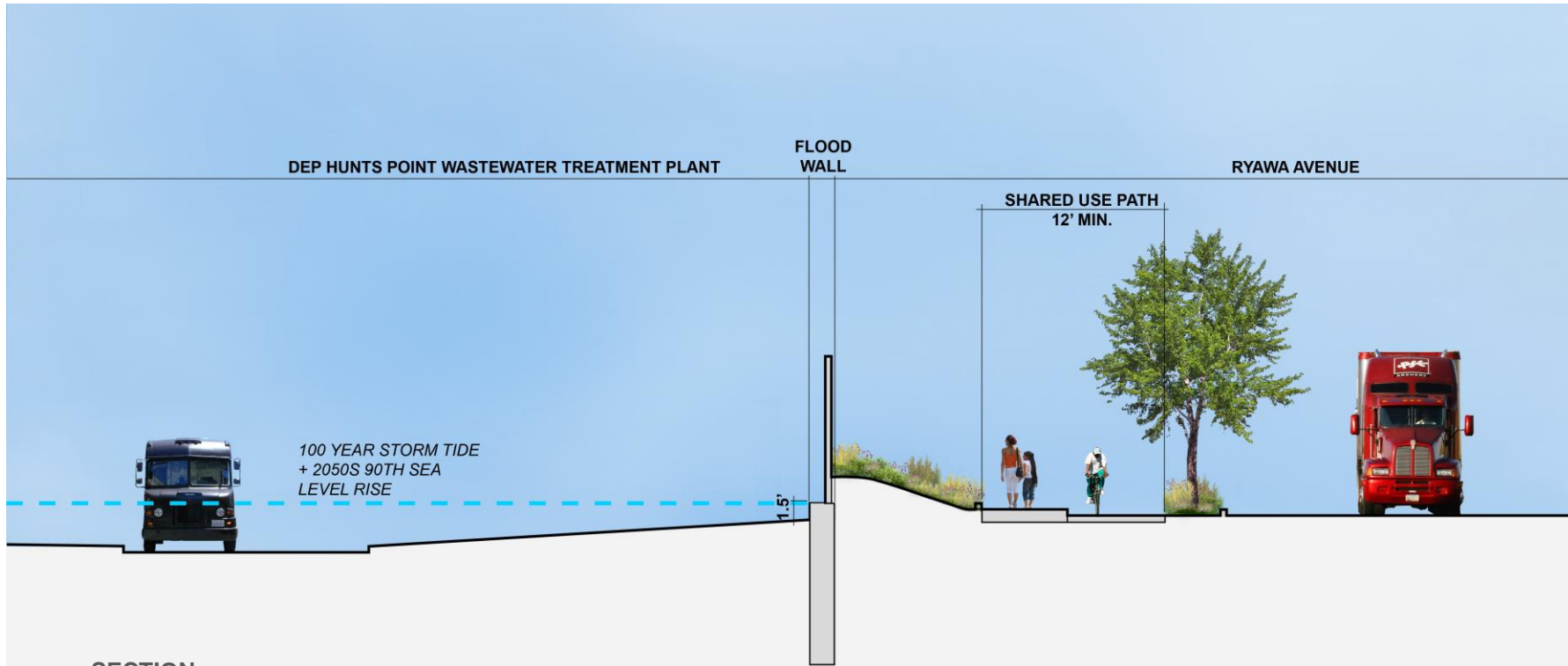
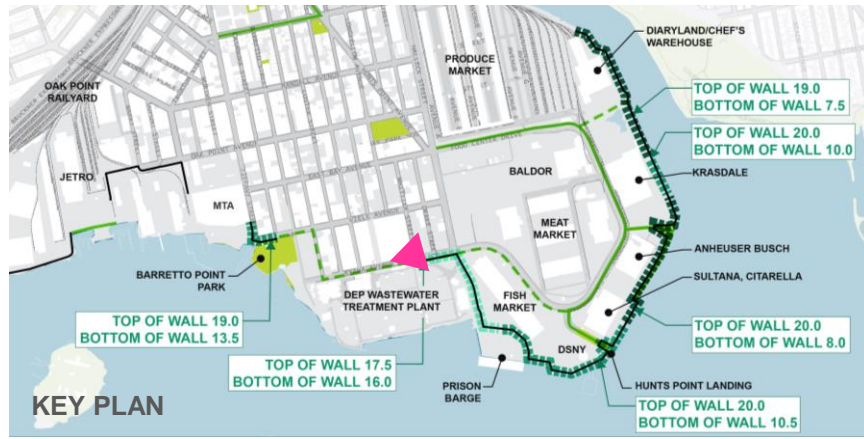
Example of floodwall at 600 Food Center Drive, Sultana/Citarella

Rip rap or loose stone used to form a foundation for a breakwater or other structure



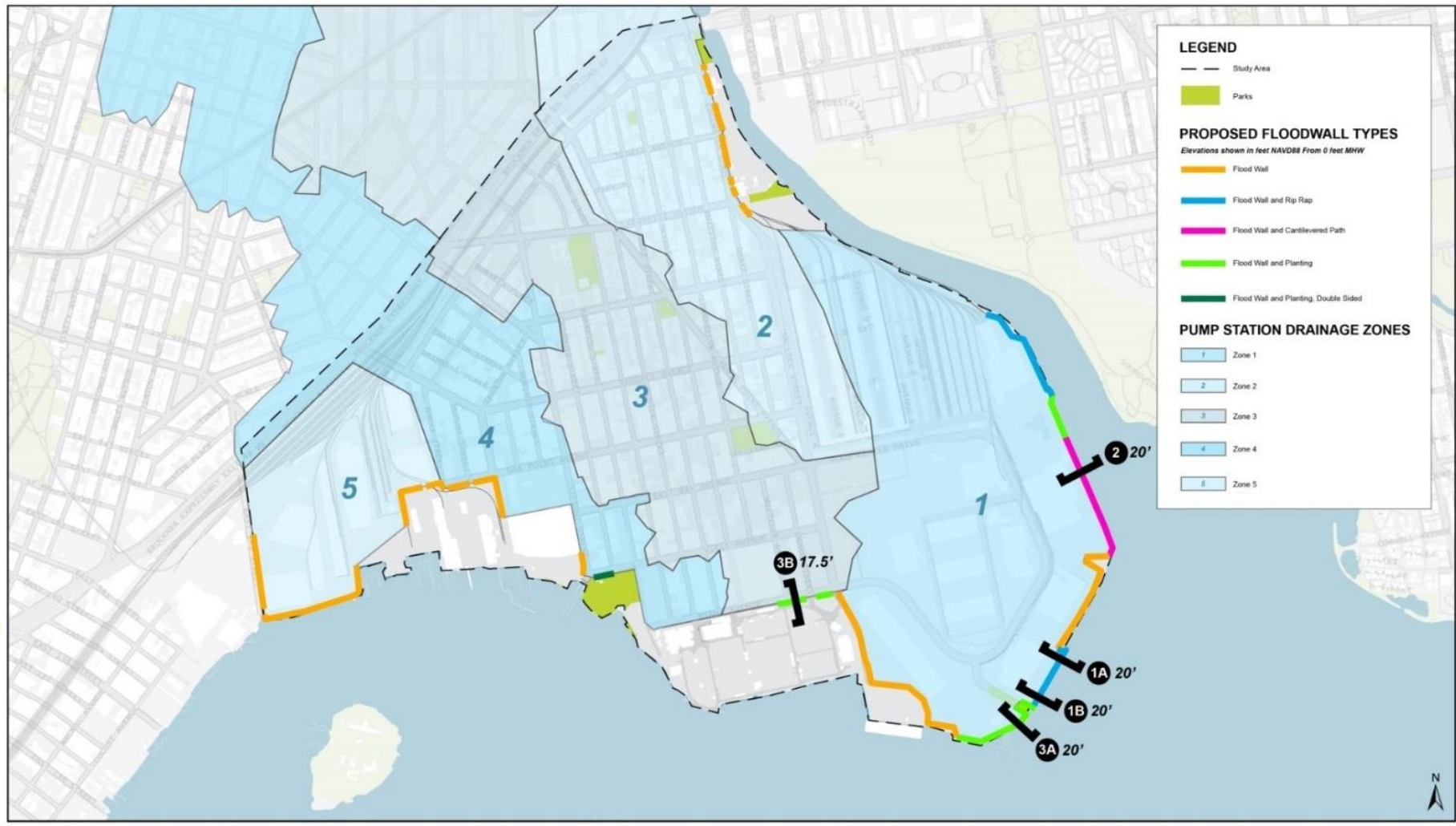
Approach 1 – Area Wide Floodwall

Example of floodwall plus planting at Ryawa Avenue
 Floodwall here would be located away from waterfront and tie into higher ground

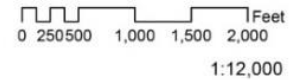


SECTION

Approach 1 – Area Wide Floodwall



AREA-WIDE FLOODWALL ALIGNMENT AND PUMP STATION DRAINAGE ZONES



Approach 1 – Area Wide Floodwall

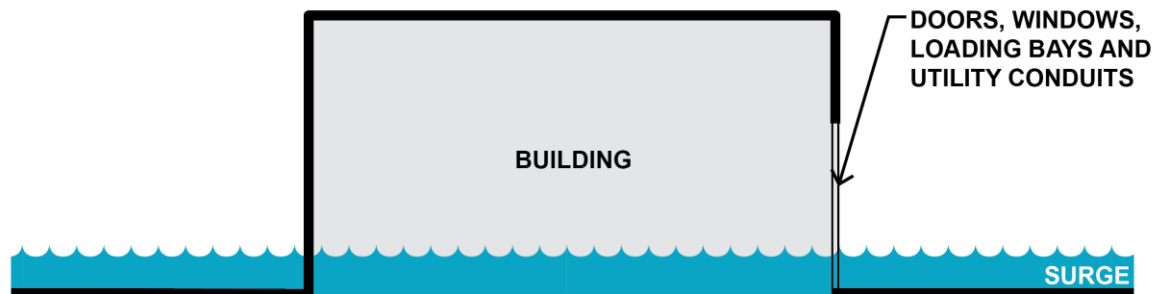
- Key design and construction challenges:
 - Expensive, and costs contain a lot of uncertainty related to:
 - Variability of subsurface soils (fill materials, contamination); creates uncertainty for foundation design
 - Property acquisition through purchase or easement
 - Required siting of multiple pump stations
 - Required sealing of subsurface penetrations
 - A mix of concrete and steel sheet piles extending 40-50 feet below ground would be needed
 - No public access to right of way
 - Failure of a single opening can lead to total inundation
 - In-water construction requires more time and permitting
 - Difficult to incorporate greening into the flood wall

Approach 2 – Elevate Buildings at the Meat Market

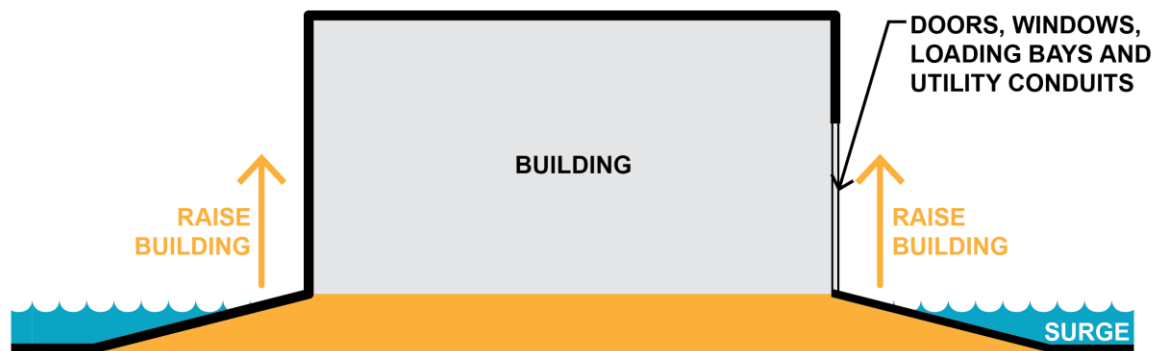
- **Elevate Buildings:** The lowest occupied floor and equipment critical to a building's operation can be elevated above a design flood elevation to protect from floodwaters.
- Elevating techniques include:
 - Jacking the structure up and building a new or extended foundation below it;
 - Leaving the structure in place and either building an elevated floor within the structure or a new upper story; or
 - Constructing a new building at a higher elevation to replace the lower elevation building.

Approach 2 – Elevate Buildings at the Meat Market

Existing low lying building vulnerable to storm surge



Proposed raised building above potential storm surge heights



Approach 2 – Elevate Buildings at the Meat Market

- Key design and construction challenges:
 - Considerable disruption of operations during construction
 - Building permits and potential zoning conflicts that may require one or more variances
 - Meat Market operating floor already has a low ceiling and offices overhead
 - Protects limited critical facilities or area

Approach 3 – Hardening at the Meat Market, Krasdale and 600 Food Center Drive

- **Hardening:** Strengthening essential systems (electrical, mechanical, fuel, communication, life-safety) to withstand floodwaters, operate during storm surge or return to service rapidly after floodwaters subside.
- Hardening includes:
 - Wet floodproofing: allowing water in building without endangering structural stability or equipment integrity
 - Dry floodproofing: preventing water from entering building or equipment

Floodbreak® system shown below; this type of passive flood barrier relies on water pressure on barrier system to raise barrier



Approach 3 – Hardening at the Meat Market, Krasdale and 600 Food Center Drive

- Key design and construction challenges:
 - Minor challenges related to site preparation, adding sidewalls, interferences with existing refrigeration sealing systems
 - Mechanical equipment can be damaged during routine facility operations, interfering with deployment
 - Deployable options present a risk in that all components must function or nothing is protected

Parallel Resiliency & Sustainability Initiatives



Resilient Efforts in Hunts Point

A multilayered approach to resiliency

Neighborhoods

Buildings

Infrastructure

& Coastal Defense

- Hunts Point Resiliency Project
- Resilient Mesh Wireless Network
- South Bronx Community Resiliency Agenda
- NYC Food Distribution & Resiliency Study
- Hunts Point Clean Truck Program
- Alternative Fuels Facility
- DEP Green Infrastructure Program
- Hunts Point Workforce1 Career Center

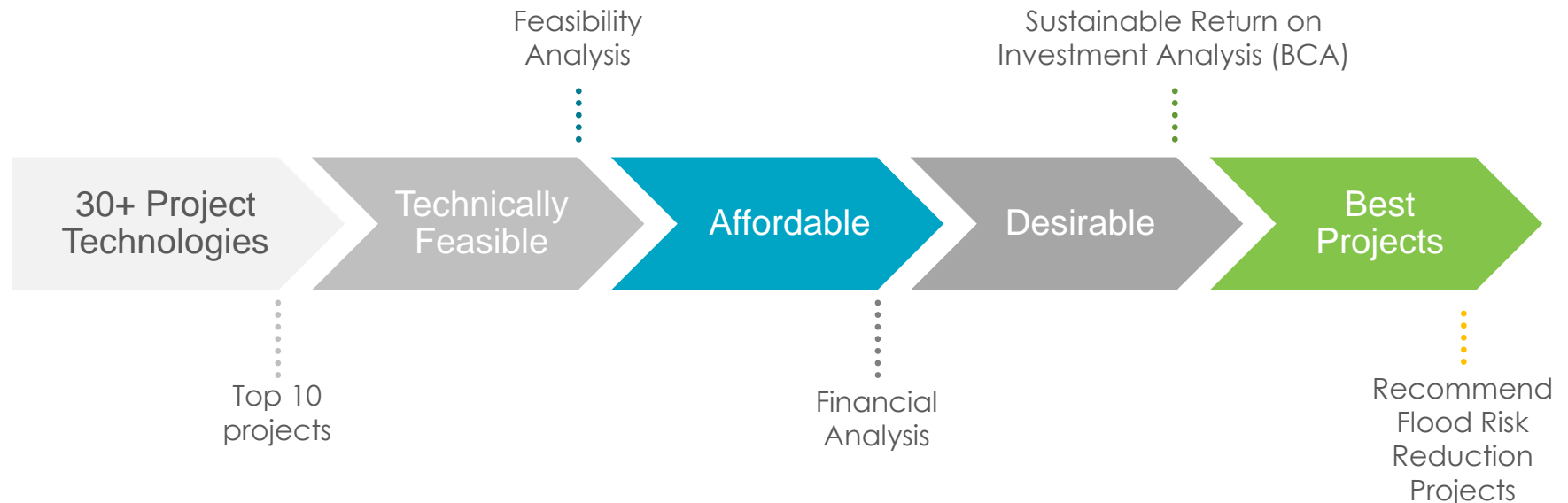
Benefit Cost Analysis



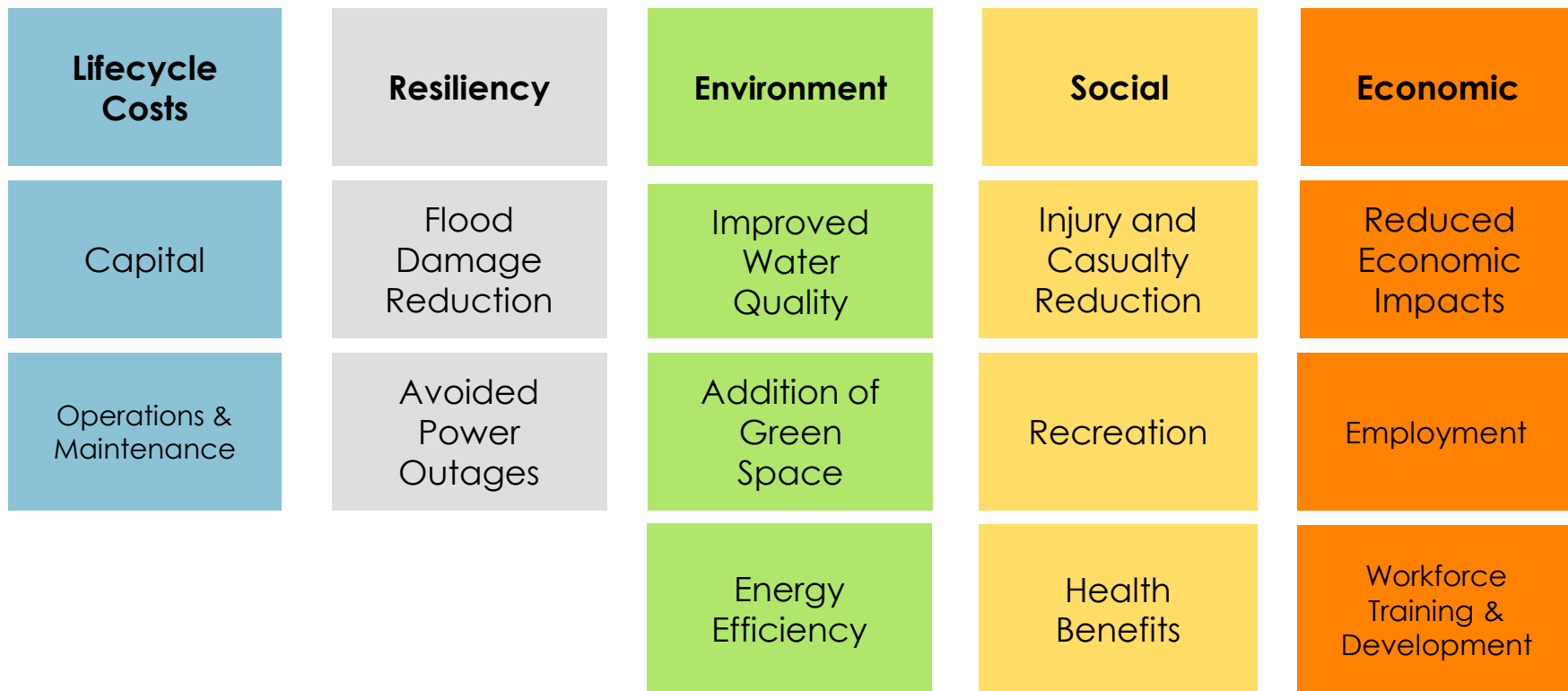
Benefit Cost Analysis

Federal Funding Requirements for Project Selection and Implementation

- Advance resiliency, independent utility
- Determining benefits in dollar terms, whenever possible, to express costs and benefits in a common measurement
- Projects need a **benefit-cost ratio greater than one** (can be any number over one, as long as greater than one)



Combining All Costs and Benefits



Sustainable Return on Investment (SROI)

SROI: Total Benefits (DRAFT)

All costs below are estimates that would be further refined during design

Metric	Area-Wide Floodwall	Elevate Buildings	Hardening
Lifecycle Costs	(\$573 M)	(\$45 M)	(\$5.5 M)
Resiliency	\$699 M	\$65 M	\$65 M
Environment	\$ -	\$ -	\$ -
Social	\$0.95 M	\$ -	\$ -
Economic	\$478 M	\$66 M	\$66 M
Net SROI	\$605 M	\$85 M	\$176 M

Preliminary Draft Flood Risk Impacts Results (DRAFT)

All costs below are estimates that would be further refined during design

Approach	1	2	3
Metric	Area-wide Floodwall	Elevate Buildings	Hardening
Total Lifecycle Costs	\$573 M	\$45 M	\$5.5 M
Resiliency + Social Benefits	\$270 M	\$6 M	\$56 M
Net Present Value	-\$303 M	-\$39 M	\$51 M
Benefit – Cost Ratio	0.5	0.2	10.2
Resiliency + Social + Economic Benefits	\$1,178 M	\$130 M	\$181 M
Net Present Value	\$605 M	\$85 M	\$176 M
Benefit – Cost Ratio	2.1	2.9	32.9

Flood Risk Reduction Approaches: Feasibility Assessment Findings

Findings from Feasibility Assessment

- All flood risk reduction approaches have associated **benefits, constraints, and risks.**
- **Hardening** has the **highest benefit cost ratio.**
- **Area-wide Floodwall** approach provides **protection for largest area but with a lower benefit-cost ratio.**
- Any proposed project **must be technically feasible with the least amount of unknowns.**
- All approaches are **mutually exclusive and not additive.** It would not be cost-effective to harden a facility behind a floodwall.
- All approaches have **residual risk after implementation.**
- **Green infrastructure** is being implemented in Hunts Point by DEP where feasible and most beneficial for water quality.
- Different projects can have different impacts on **workforce development and retention.**

Stakeholder Engagement

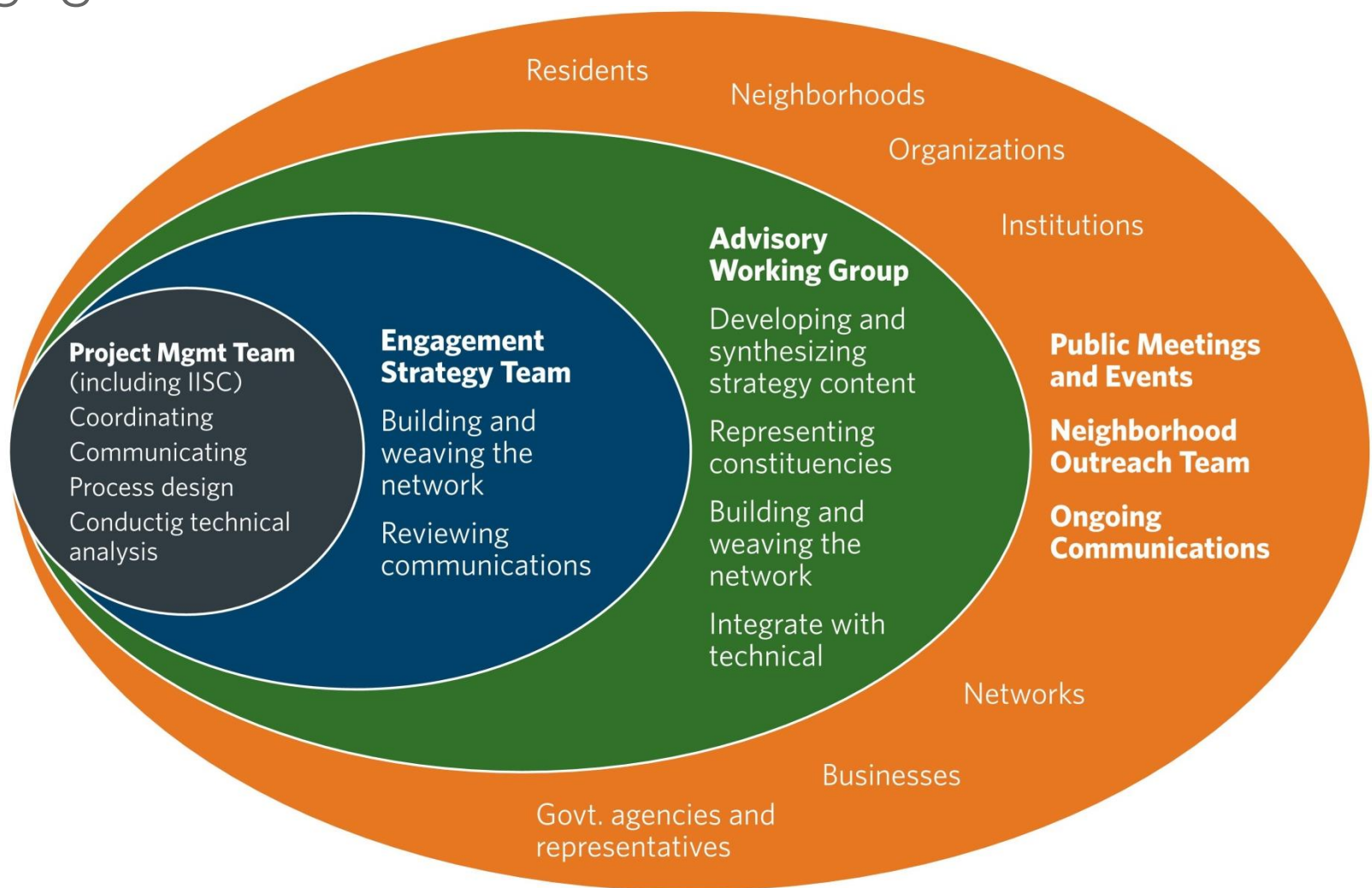
Future Meetings

Engagement Strategy Team/ Neighborhood Outreach Team	Advisory Work Group	Public Meeting
<i>TBD</i>	October 3 10:30 AM-12:30 PM	November 14 6:00-8:00 PM
		December 12* 6:00-8:00 PM

Collaboration Lab (July 27)

** With Advisory Working Group, Engagement Strategy & Neighborhood Outreach Teams*

Engagement Structure



The rings of engagement for Hunts Point Resiliency illustrate how specific teams are embedded within others for communications flow and to fulfill different functions. The graphic is not intended to represent decision-making.

Engagement Strategy Team (EST)

Purpose

To finalize and oversee implementation of the Stakeholder Engagement Plan to ensure robust engagement throughout the Hunts Point Resiliency process, including input into key technical deliverables and incorporation of resiliency knowledge and skills into local programming (education, workforce development, cultural outlets).

EST: 7 Suggestions

Purpose

1. Focus on real outcomes and the timeline for making things happen.
2. Make sure we have an answer to this question for anyone we engage – “Why does this matter to me?”
3. Help people understand limits on grant money and the City’s commitment to bring more money into the community.
4. Make sure that, whichever project gets selected, protects people and not just buildings.
5. Talk about risks but also strengths of the community and what we are already doing in Hunts Point.
6. Look for opportunities to engage new leadership in the Hunts Point community.
7. Keep the Implementation Principles front and center.

Staying in Touch

- Website | www.huntspointresiliency.nyc
- Email | Huntspointresiliency@edc.nyc
- Social media (Twitter and Instagram)
 - EDC @NYCEDC
 - ORR @NYClimate
- Snail mail:
 - New York City Economic Development Corporation
Attn: Charlie Samboy
110 William Street
New York, NY 10038
- Engagement Coach (working with Neighborhood Outreach Team) – eacuna@interactioninsitute.org

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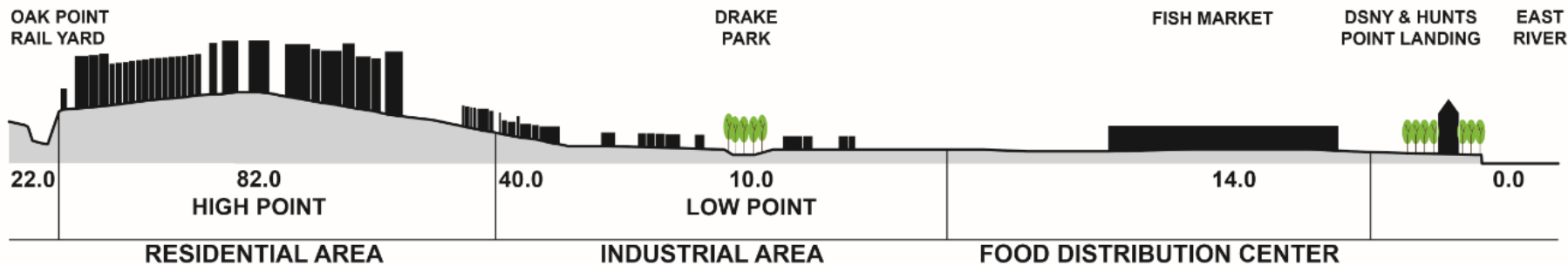
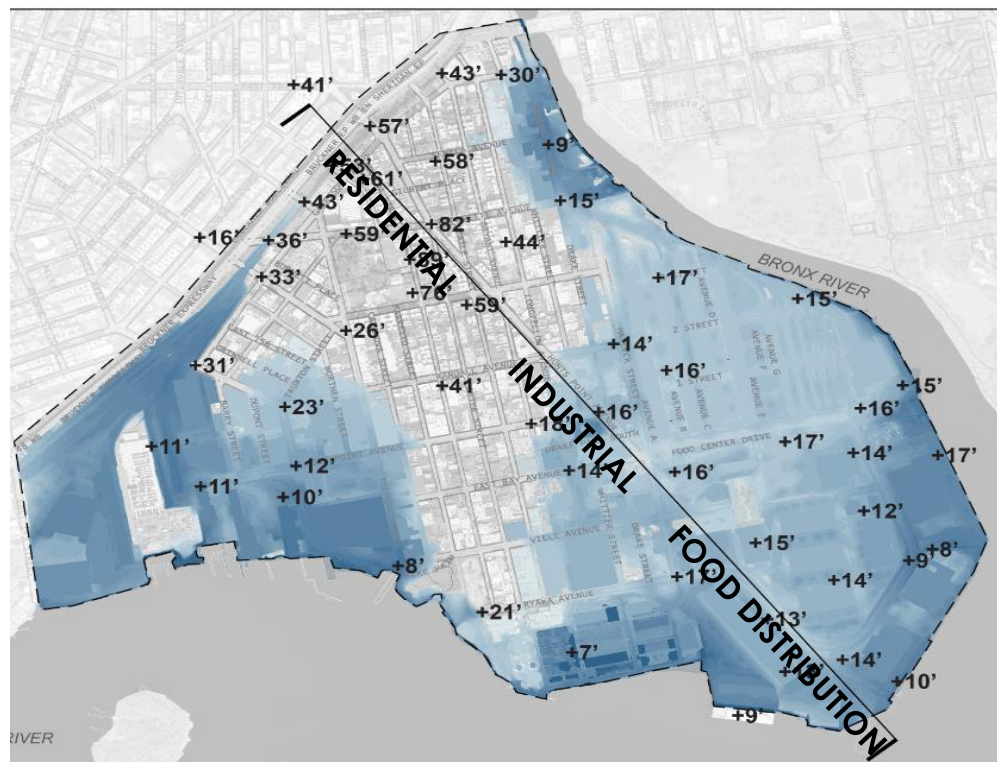


Back Up Slides

Flood Vulnerability Findings

Key Findings

- Upland residential areas do NOT face significant threats from coastal flooding.
- Low-lying industrial and commercial areas face significant threats from coastal flooding.



VERTICALLY SCALED 500%

Screening of a Multi-purpose Levee in Hunts Point

Spatial Impact of Areawide Levee



Non-Monetized SROI Benefits

Environment

- **Improved Water Quality** benefits would result largely from the prevention of contaminated or industrial materials along waterfront from entering the Bronx River
- **Addition of Green Space** to the extent provided would improve aesthetics primarily; therefore, considered more for positive impacts on recreation and related health benefits
- **Energy Efficiency** benefits would be small cross all options; however, energy usage requirements to operate pumping stations as part of floodwall options are noted

Non-Monetized SROI Benefits

Social

▪ **Injury and Casualty Reduction**

- Few residents in 100-year floodplain
- Persons 65 and older are at greatest risk but not in area of expected flooding
- Options likely to prevent limited numbers of casualties and injuries
 - Non-fatal injury incidence rates during hurricanes: 9% (average), 10.4% (Hurricane Sandy)
 - Casualty rates less than 1%
- Primary injury and casualty risk due to loss of power (trips, falls and other related injuries)

Non-Monetized SROI Benefits

Economic

■ Employment

- Temporary Jobs: Construction contractors, skilled trades (concrete, steel, earthwork, HVAC, and plumbing), and unskilled labor
- Permanent Jobs: Depends on ownership and operation of resiliency measure(s) but number expected to be small

Construction Job Estimates

Area Wide Floodwall	Elevate Buildings	Hardening
~ 3,600	~ 300	~ 30

Non-Monetized SROI Benefits

Economic

- **Workforce Training and Development**
 - Job opportunities most likely to increase through employment growth at economic centers and turnover at businesses that are protected from future flood risks