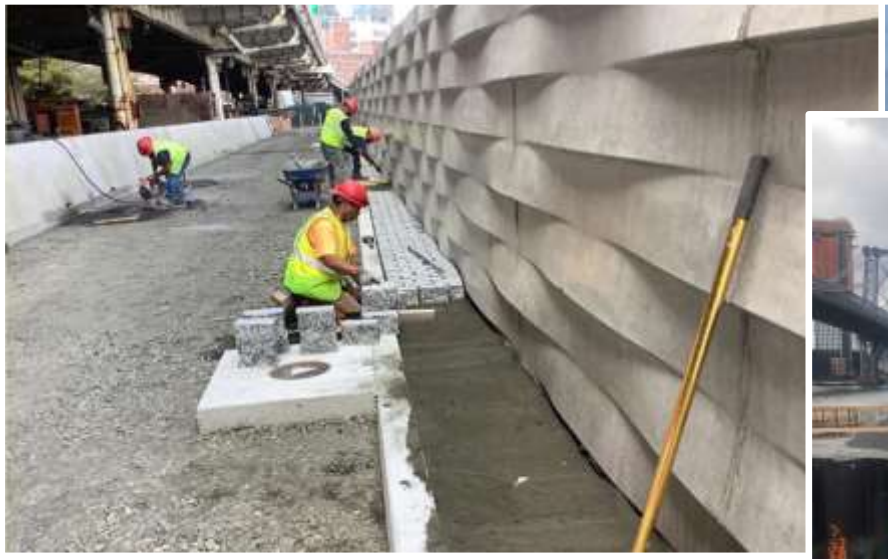
THE BIG U FROM CONCEPT TO REALIZATION

MANHATTAN'S EAST SIDE COASTAL RESILIENCE PROJECT + FINANCIAL DISTRICT MASTERPLAN

AUGUST 24, 2PM – 3:30PM ET, VIRTUAL WEBINAR

ALL SLIDES FREE TO USE WITH SOURCE REFERENCE (ARCADIS, BIG TEAM, ONE ARCHITECTURE)

BIG U FROM CONCEPT TO REALIZATION



Manhattan Big U – Concept to Realization

Matthijs Bouw

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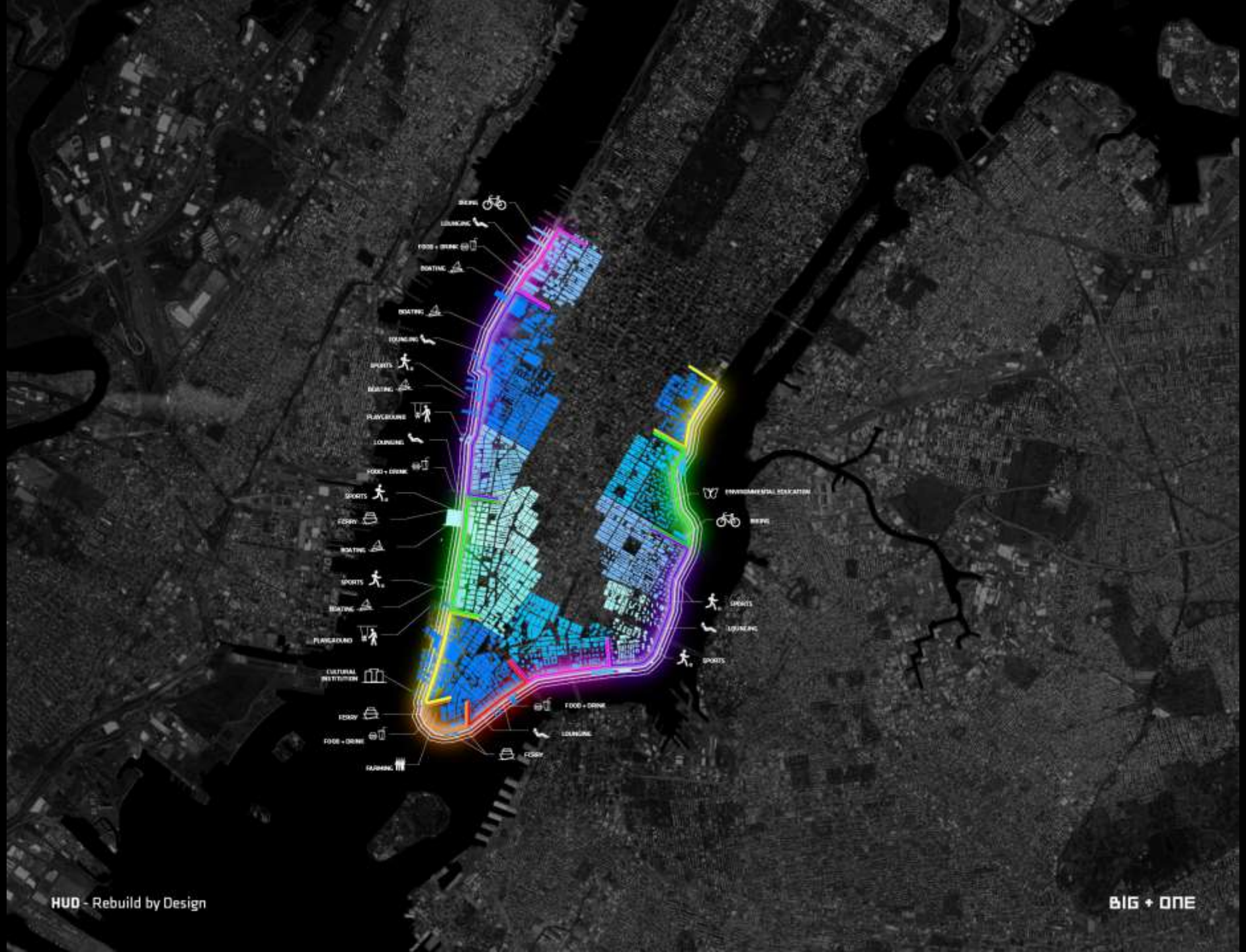
one architecture
new york city amsterdam

Weitzman
SCHOOL OF DESIGN
UNIVERSITY of PENNSYLVANIA



HUD - Rebuild by Design

BIG + ONE

REBUILD BY DESIGN ANNOUNCEMENT

JUNE 2, 2014

SOME REFLECTIONS ON RESILIENCE PROJECTS IN COMPLEX URBAN ENVIRONMENTS

Shenzhen Design Week (courtesy ONE Architecture & Urbanism)

TAKE TIME TO EXPLORE AND DEFINE THE PROBLEM

Designing the Process of Rebuild by Design

The Task Force, with a core group of advisors and staff, created a unique structure for the competition. A successive and connected set of stages was established to orient the design process around in-depth research, cross-sector, cross-professional collaboration, and iterative design development. The design process incorporated a variety of inputs to ensure that each stage's deliverables were based on the best knowledge and talent, and that the final proposals would be replicable, regional and implementable.

Making room for a collaborative and innovative approach was a sidestep away from the institutional world. A detour around negotiations, the process aimed to build understanding and trust.

1 TALENT

Objective Gather the talent of the world to work with the talent of the Sandy-affected region.

Process Task Force issues a Request for Qualifications and Approaches calling for teams to assemble themselves in interdisciplinary partnerships to tackle the region's physical and social vulnerabilities.

To incentivize participation, the Federal Government pledges funding to implement the winning designs while private philanthropy pledges prize money for competitors.

Result Ten finalist design teams are selected comprising a diverse set of complementary skills and approaches.

2 RESEARCH

Objective Establish the broadest possible understanding of the region's vulnerabilities to future risks and uncertainties, to enhance resilience.

Process Rebuild by Design's local partner organisations create an intensive, three-month programme of field research to introduce teams to a variety of local stakeholders, providing a comprehensive view of the storm's effects—the damage it created as well as the long-standing problems it uncovered or exacerbated.

A Research Advisory Board leads the teams through the region to learn from a variety of perspectives, and teams conduct additional research to supplement this on-the-ground work. Research is collaborative across teams and focuses on typologies as well as locations.

Result A public presentation from each team that includes three to five 'design opportunities' describing conceptual approaches for interventions and an overall compilation of research submitted by all teams.

3 DESIGN

Objective Develop implementable solutions that have support from local communities and governments.

Process Housing and Urban Development (HUD) Secretary Shaun Donovan selects, on average, one design opportunity for each team to develop. Teams then gather diverse local stakeholders into community coalitions, with whom they begin a four-month process of co-designing the final interventions. Using meetings, colloquia, charrettes, and non-traditional events to gain the broadest perspectives, they create solutions that not only address disaster scenarios, but also enrich the daily life of community members.

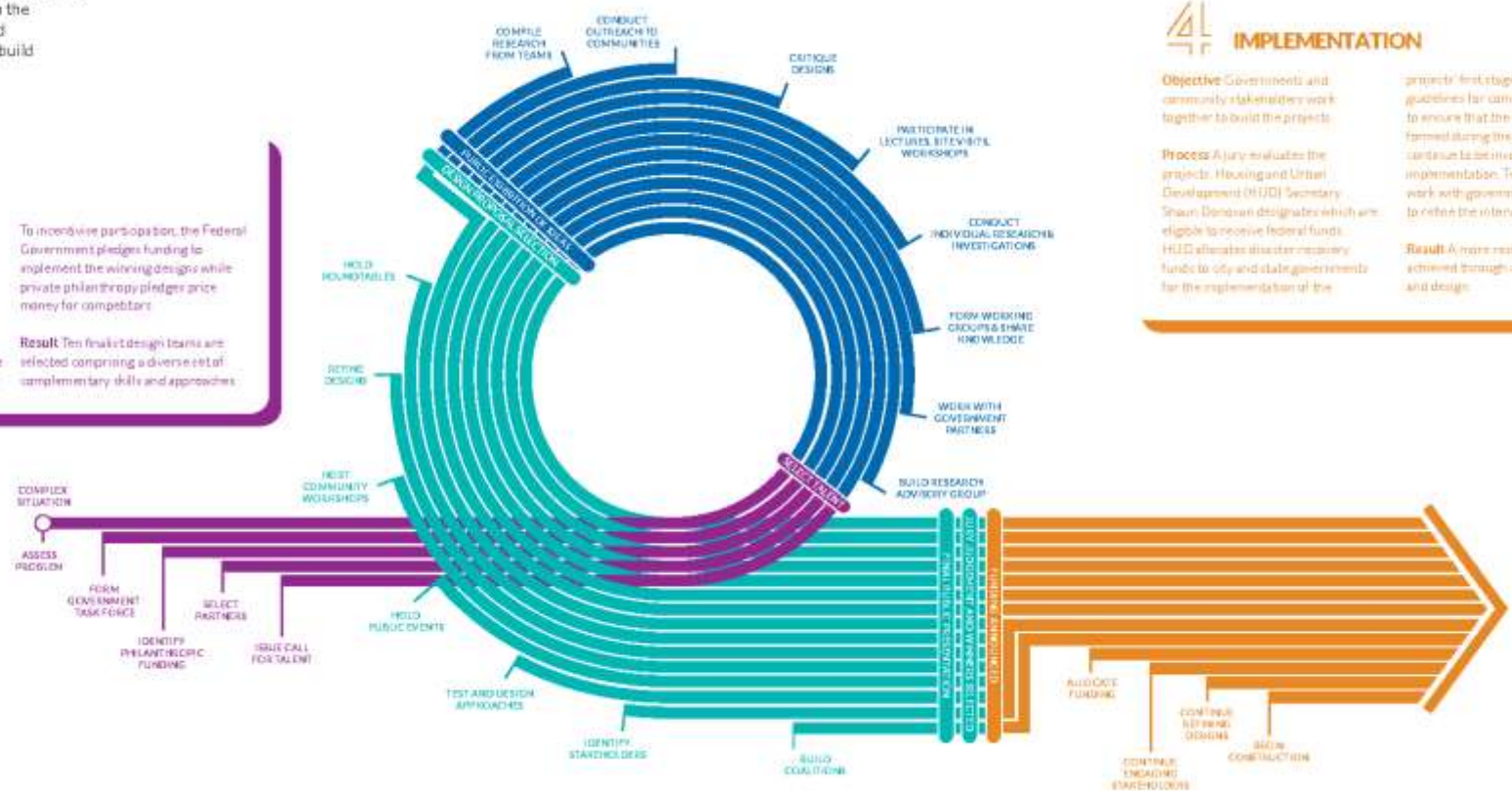
Result Ten fully developed, implementable resilience proposals champion communities' visions for future development and have support from the local governments.

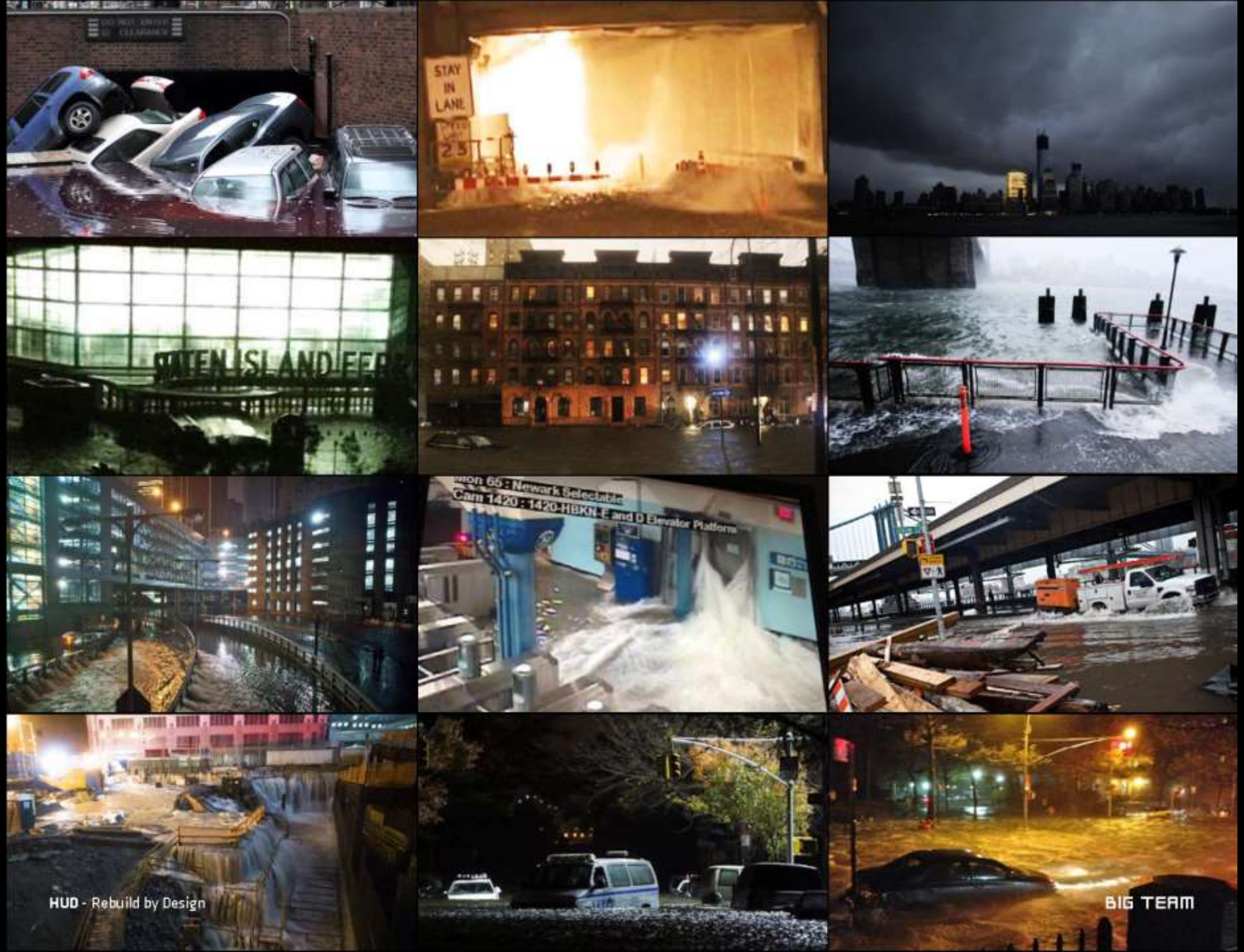
4 IMPLEMENTATION

Objective Governments and community stakeholders work together to build the projects.

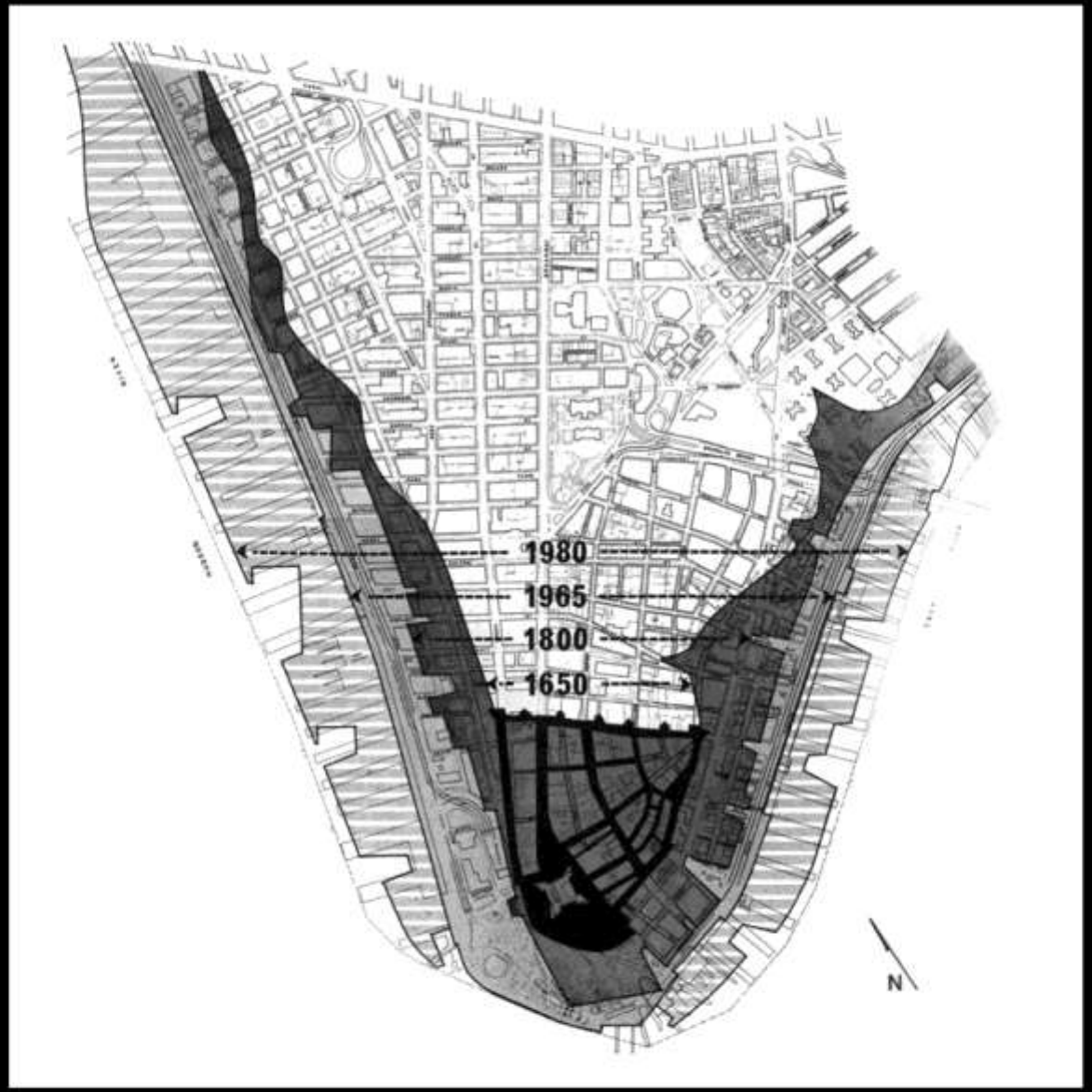
Process A jury evaluates the projects. Housing and Urban Development (HUD) Secretary Shaun Donovan designates which are eligible to receive federal funds. HUD allocates disaster recovery funds to city and state governments for the implementation of the projects' first stages. HUD sets strong guidelines for community involvement to ensure that the coalitions formed during the competition continue to be involved through implementation. Teams are poised to work with government and communities to refine the interventions.

Result A more resilient region achieved through collaboration and design.

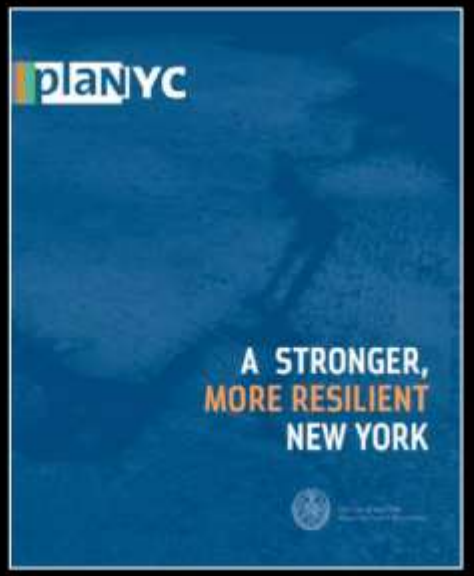



STAY
IN
LANE
25
Cam 1420 : 1420-HBKN-E and D Elevator Platforms
HUD - Rebuild by Design
BIG TEAM


FEMA FLOOD ZONE
HUD - Rebuild by Design
BIG TEAM


1980
1965
1800
1650
N

2013 - PLANYC SPECIAL INITIATIVE FOR REBUILDING AND RESILIENCY



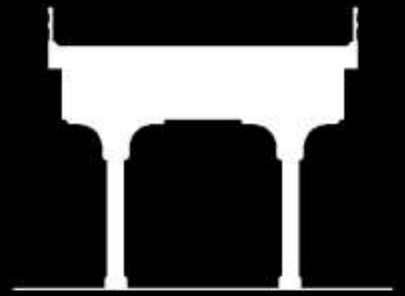

SIRR REPORT RECOMMENDS MANHATTAN, 8 CONTINUOUS MILES OF INTEGRATED COASTAL PROTECTION!
BULKHEAD
INTEGRATED FLOOD PROTECTION SYSTEM
INTEGRATED FLOOD PROTECTION SYSTEM
STONE REVETMENT
HUD - Rebuild by Design
BIG TEAM


BIG TEAM


the sooner you park your car,
the sooner you can stop thinking

PROGRAM

+

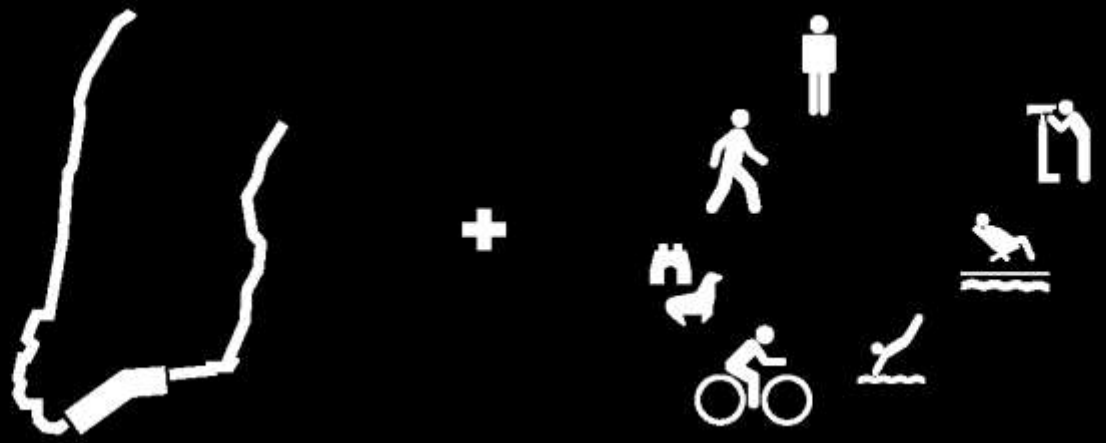


INFRASTRUCTURE

RESILIENCY INFRASTRUCTURE

+

PEOPLE!



RESILIENCY INFRASTRUCTURE

PROGRAM


Community Board 3
Two Bridges Neighborhood Council
Damaris Reyes
Smith House Residents
Round 2 Public Workshop - LES Girls Club
SODT

INVEST IN ENGAGEMENT AND STEWARDSHIP

TWO ROUNDS OF PUBLIC WORKSHOPS

The New York Times

HEADWAY

What Does It Mean to Save a Neighborhood?

Nine years after Hurricane Sandy, residents of Lower Manhattan are still vulnerable to rising seas. The fight over a plan to protect them reveals why progress on our most critical challenges is so hard.

WORK TOWARDS MULTIPLE BENEFITS

LONG-TERM PERSPECTIVE

EAST RIVER PARK. 2014

HUD - Rebuild by Design

BIG TERM

LONG-TERM PERSPECTIVE

THE BRIDGING BERM...

THE BRIDGING BERM

ADA ACCESSIBLE RAMPING CONNECTIONS

THE BRIDGING BERM

NEW TOPOGRAPHY AND VISTAS OVER PARK

TWO BRIDGES - UNDER FDR

EXISTING CONDITION

FLIP-DOWN DEPLOYABLE ART

A NEW BAND OF PUBLIC SPACE ALONG THE WATERFRONT!

THE STORM

PANELS DEPLOYED IN PLACE PRIOR TO EVENT

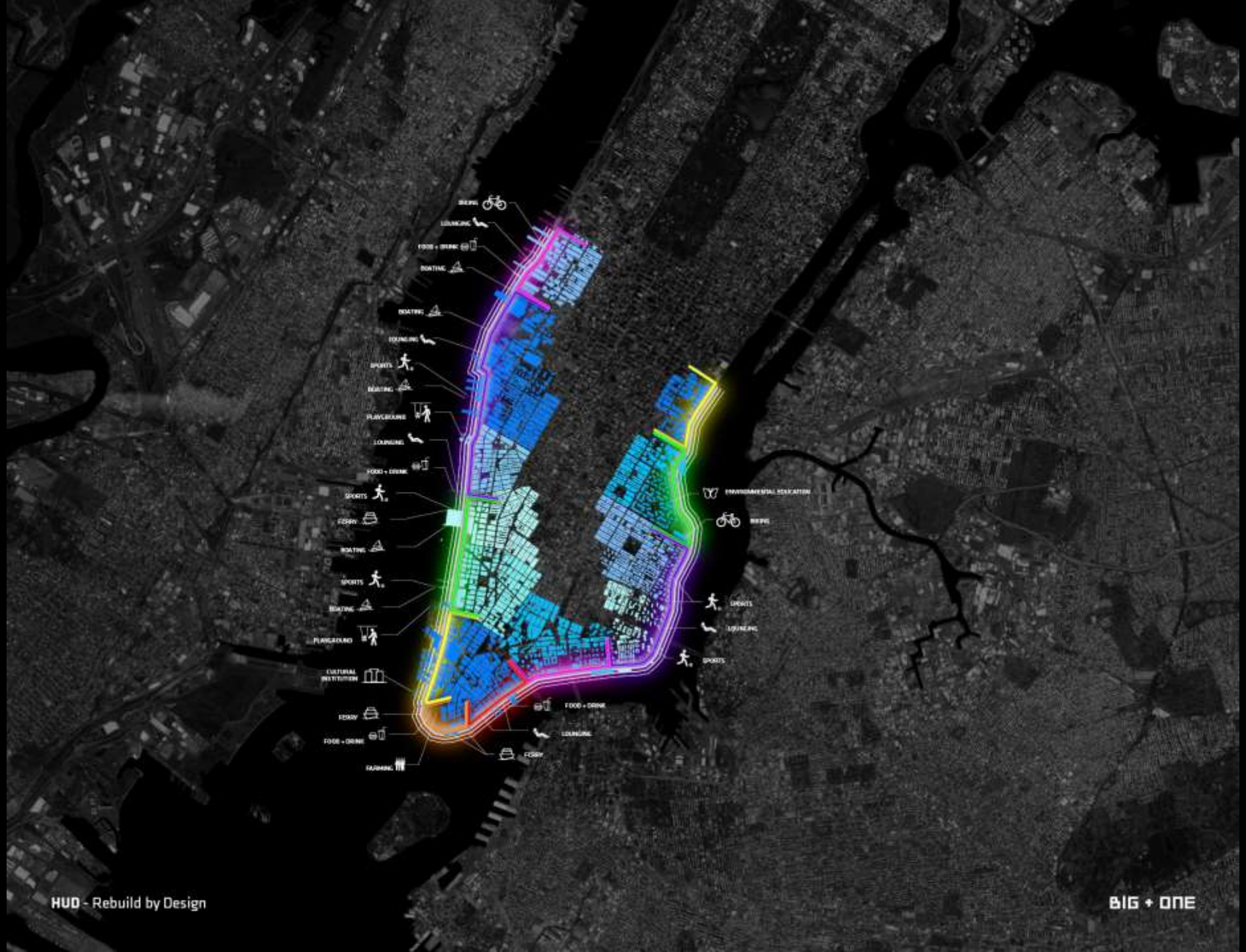
FULTON FISH MARKET

EXISTING CONDITIONS

SOUTH STREET PAVILIONS

FLEXIBLE PROGRAMMING ON FLOODSIDE!

RIGHT SIZE THE PROJECTS



HUD - Rebuild by Design

BIG + ONE

THE BIG U - FROM BIG U TO SMALL Us

SMALLER Us
MEANS SMALLER AREAS
AND MANAGEABLE SCALES

HUD - Rebuild by Design

BIG + ONE

THE BIG U - EAST SIDE COASTAL RESILIENCY (ESCR)

COMPARTMENTS CAN BE DEVELOPED SEPARATELY AS FUNDING BECOMES AVAILABLE

ESCR

HUD/ NDRC

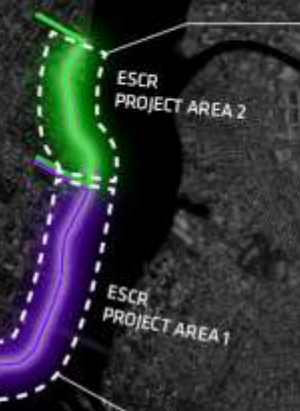
$335,000,000

HUD - Rebuild by Design

BIG + ONE

THE BIG U - EAST SIDE COASTAL RESILIENCY (ESCR)

SMALLER Us ALLOW BETTER COMMUNITY ENGAGEMENT



HUD - Rebuild by Design

BIG + ONE

THE BIG U - EAST SIDE COASTAL RESILIENCY (ESCR)

SMALLER Us GET
BETTER SUPPORT
FROM LOCAL PLAYERS

HUD - Rebuild by Design

BIG + ONE

THE BIG U - EAST SIDE COASTAL RESILIENCY (ESCR)

SMALL Us BLEND IN BETTER WITH ONGOING EFFORTS

THE BIG U – BUILDING UP FROM SMALL Us

SMALLER Us GROW
INTO LARGER Us
AT A MANAGEABLE PACE

THE BIG U - LOWER MANHATTAN COASTAL RESILIENCY (LMCR)

LMCR

NYC $107,000,000

HUD/ NDRC $176,000,000

Federal Government Awards $176 Million For Flood Protection Below Montgomery Street

HUD - Rebuild by Design

BIG + ONE

COLLABORATE WITH STAKEHOLDERS and WITHIN THE TEAM

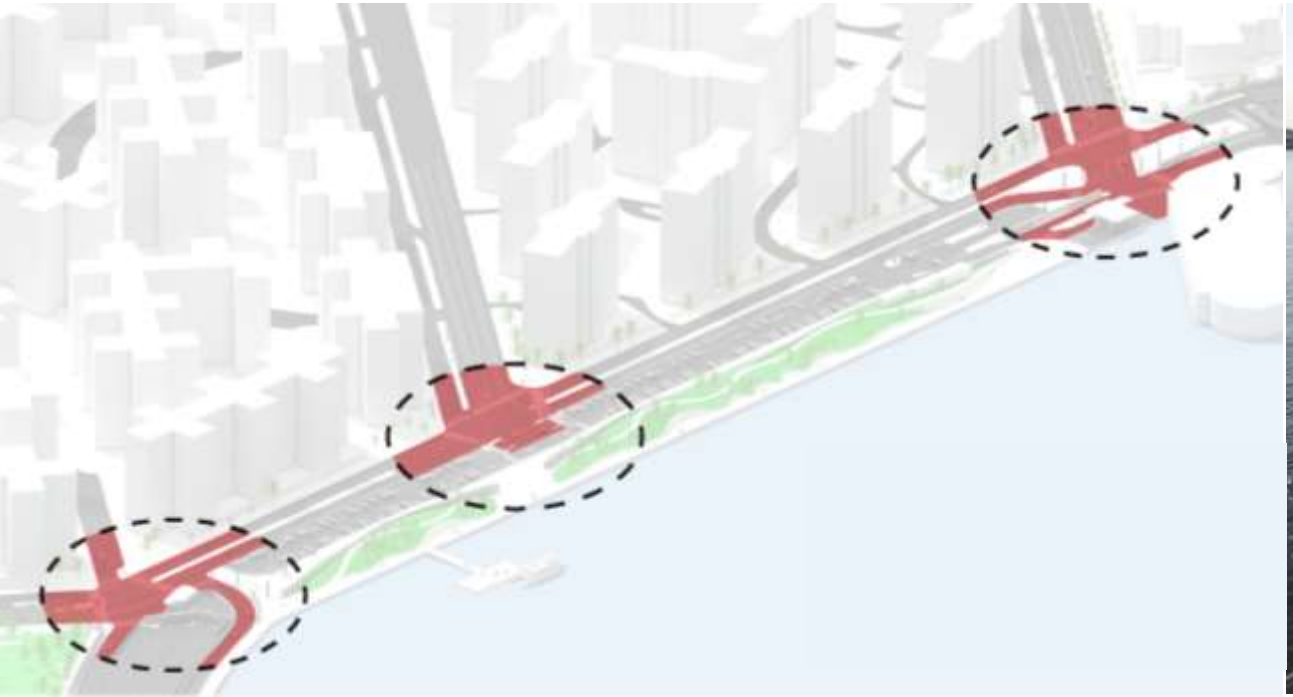
Align O&M

DELANCEY OVERLOOK
CURRENT PLAN

DELANCEY OVERLOOK
CURRENT PLAN - STORM CONDITIONS

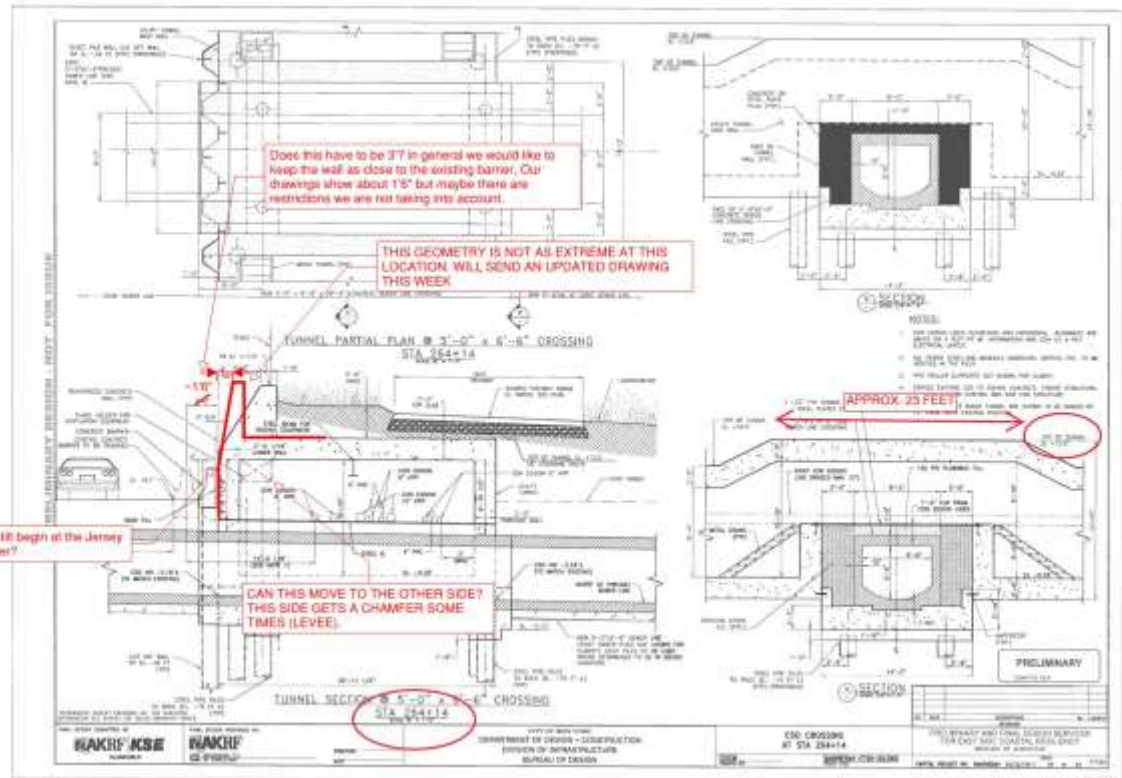

EXIT 7
E 20 - E 23 St
RIGHT LANE

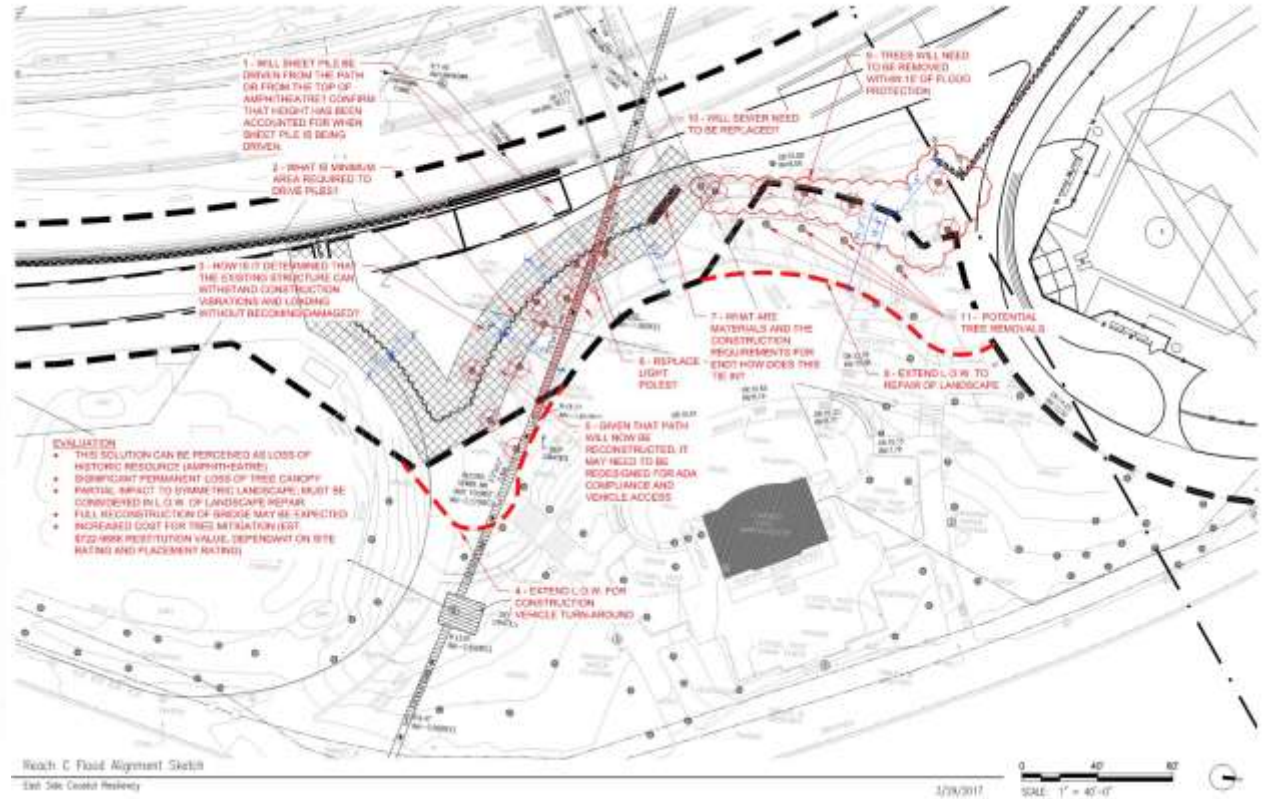
Design for other interests

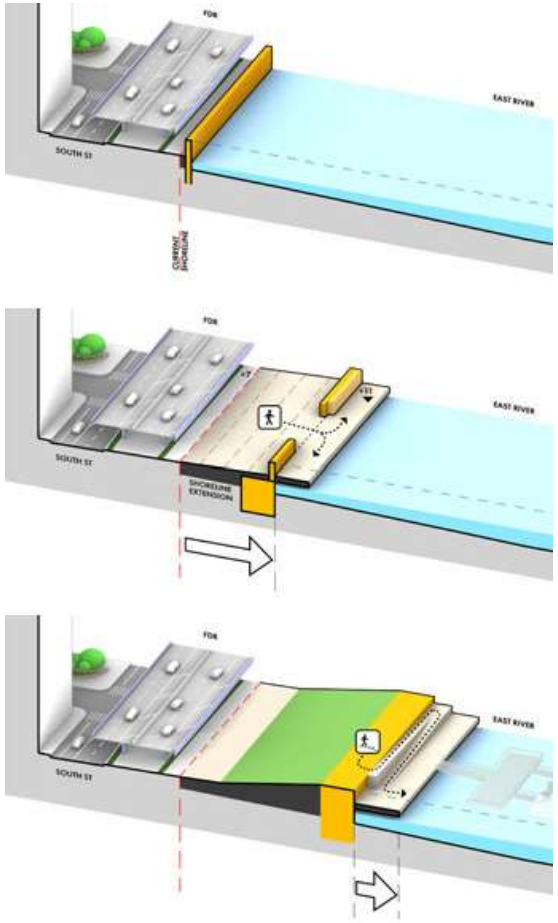


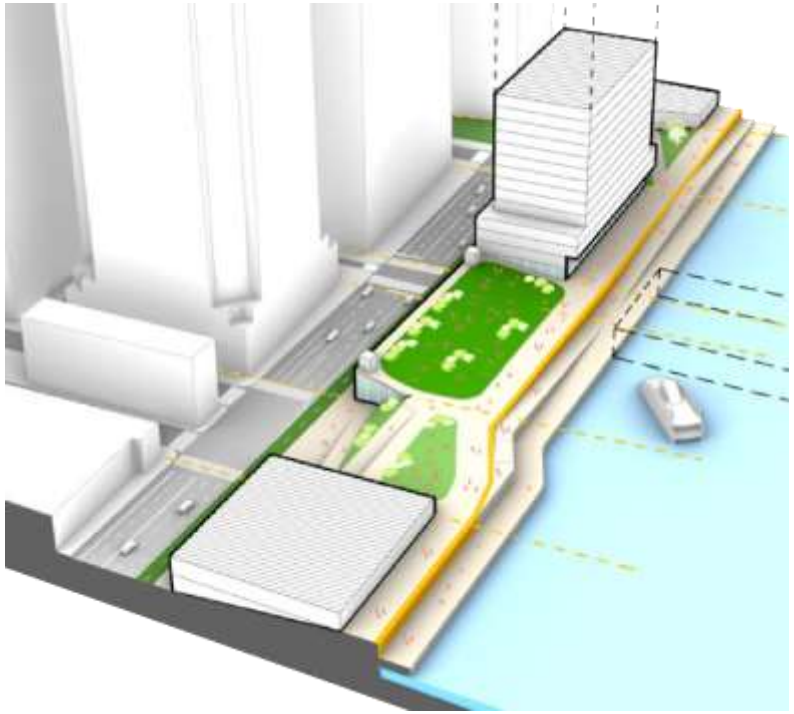
Win - Wins

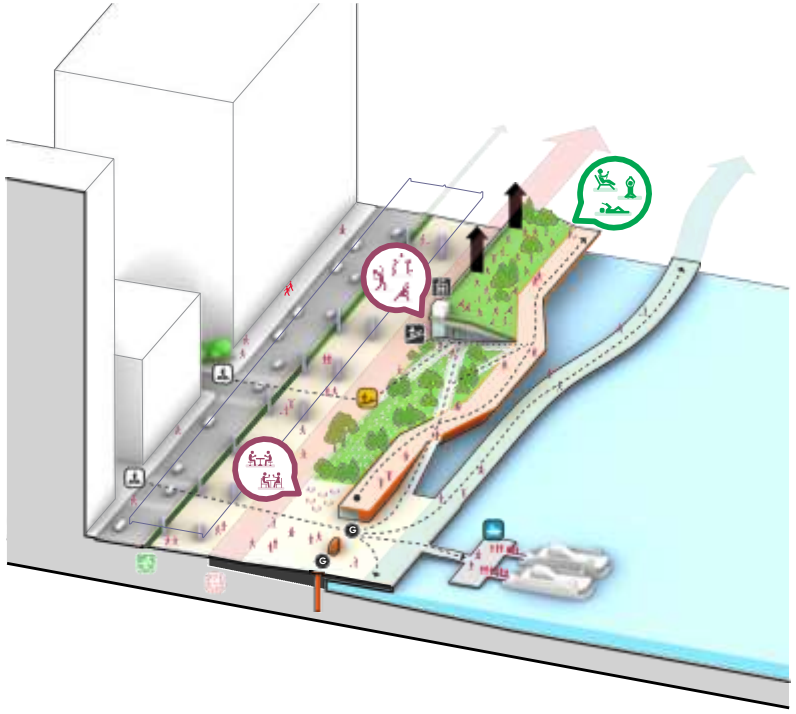
Integrate Design and Engineering

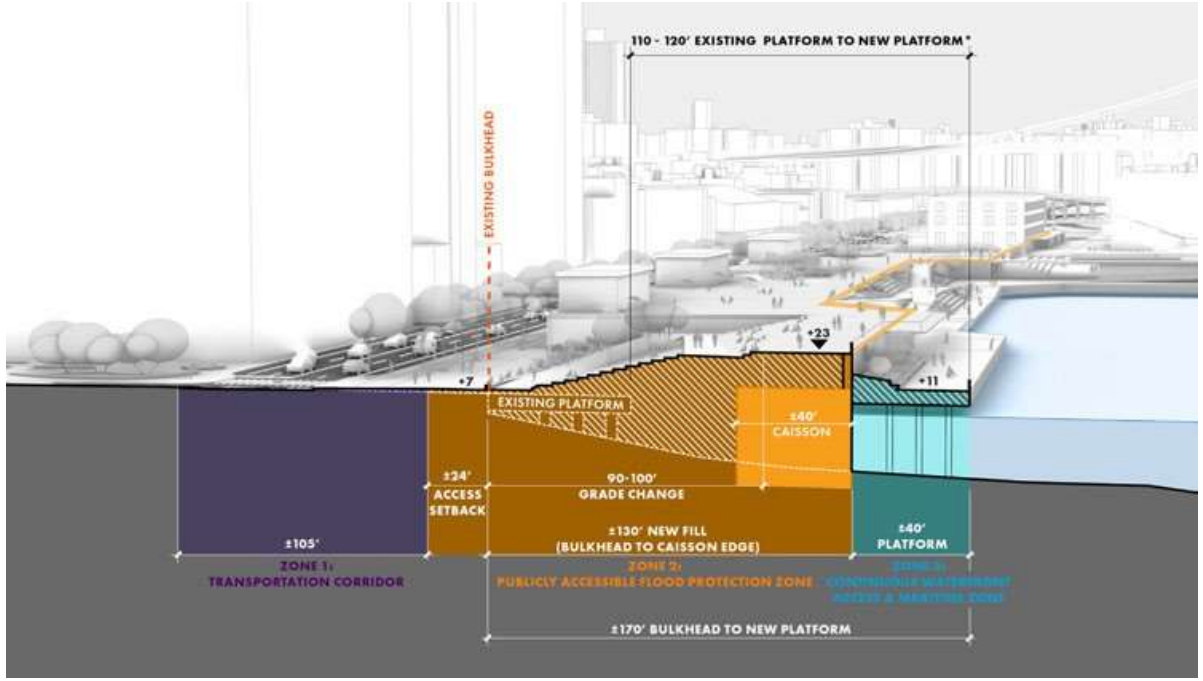

Does this have to be 3'? in general we would like to keep the wall as close to the existing barrier. Our drawings show about 1'6" but maybe there are restrictions we are not taking into account.
THIS GEOMETRY IS NOT AS EXTREME AT THIS LOCATION. WILL SEND AN UPDATED DRAWING THIS WEEK
TUNNEL PARTIAL PLAN @ 3'-0" x 6'-6" CROSSING
STA 264+14
APPROX. 23 FEET
Can tilt begin at the Jersey barrier?
CAN THIS MOVE TO THE OTHER SIDE? THIS SIDE GETS A CHAMFER SOME TIMES (LEVEE).
TUNNEL SECTION @ 3'-0" x 6'-6" CROSSING
STA 264+14
PRELIMINARY

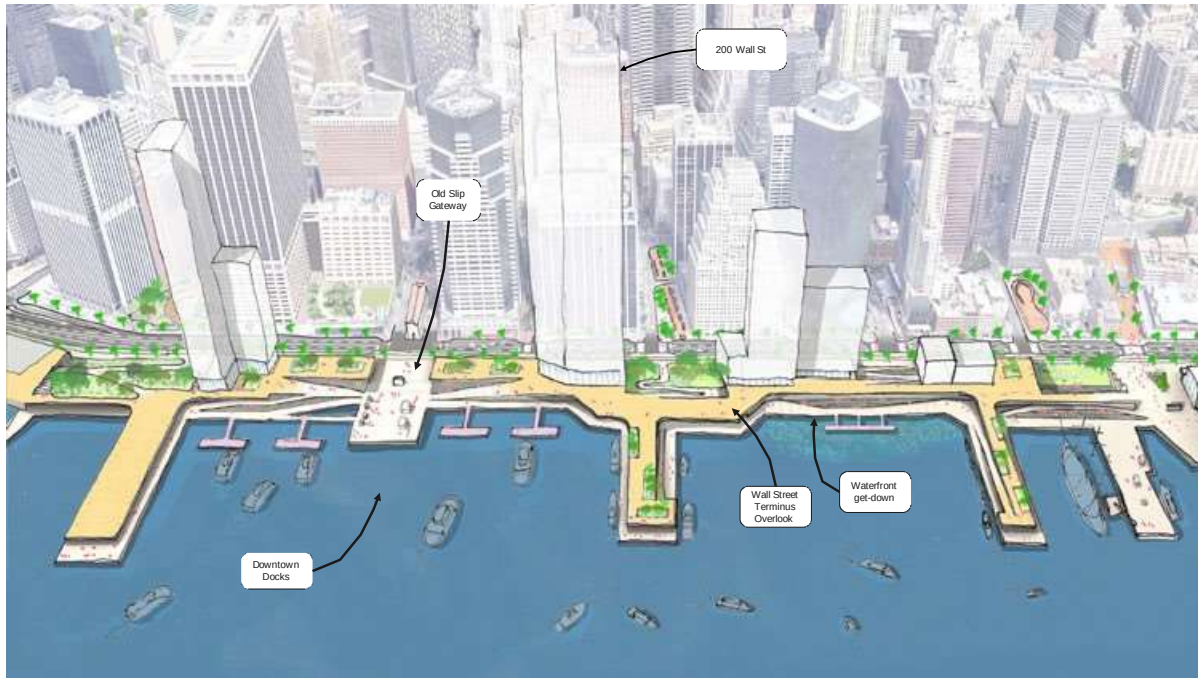

1 - WILL SHEET PILE BE DRIVEN FROM THE PATH OR FROM THE TOP OF AMPHITHEATRE? CONFIRM THAT HEIGHT HAS BEEN ACCOUNTED FOR WHEN SHEET PILE IS BEING DRIVEN.
2 - WHAT IS MINIMUM AREA REQUIRED TO DRIVE PILES?
3 - HOW IS IT DETERMINED THAT THE EXISTING STRUCTURE CAN WITHSTAND CONSTRUCTION VIBRATIONS AND LOADING WITHOUT BECOMING DAMAGED?
4 - EXTEND L.O.W. FOR CONSTRUCTION 20' VEHICLE TURN-AROUND
5 - GIVEN THAT PATH WILL NOW BE RECONSTRUCTED, IT MAY NEED TO BE REDESIGNED FOR ADA COMPLIANCE AND VEHICLE ACCESS
6 - REPLACE LIGHT POLES?
7 - WHAT ARE MATERIALS AND THE CONSTRUCTION REQUIREMENTS FOR ETHOT HOW DOES THIS TIE IN?
8 - EXTEND L.O.W. TO REPAIR OF LANDSCAPE
9 - TREES WILL NEED TO BE REMOVED WITHIN 15' OF FLOOD PROTECTION
10 - WILL SEWER NEED TO BE REPLACED?
11 - POTENTIAL TREE REMOVALS
EVALUATION
THIS SOLUTION CAN BE PERCEIVED AS LOSS OF HISTORIC RESOURCE (AMPHITHEATRE)
SIGNIFICANT PERMANENT LOSS OF TREE CANOPY
PARTIAL IMPACT TO SYMMETRIC LANDSCAPE, MUST BE CONSIDERED IN L.O.W. OF LANDSCAPE REPAIR
FULL RECONSTRUCTION OF BRIDGE MAY BE EXPECTED
INCREASED COST FOR TREE MITIGATION ($722-999K PERTITUTION VALUE, DEPENDANT ON SITE RATING AND PLACEMENT RATING)
Reach C Flood Alignment Sketch
East Side Coastal Resiliency
3/29/2017
SCALE: 1" = 40'-0"


FDR
EAST RIVER
SOUTH ST
CURRENT SHORELINE
FDR
EAST RIVER
SOUTH ST
SHORELINE EXTENSION
FDR
EAST RIVER
SOUTH ST






110 - 120' EXISTING PLATFORM TO NEW PLATFORM*
EXISTING BULKHEAD
+7
+23
+11
EXISTING PLATFORM
±40'
CAISSON
±24'
ACCESS
SETBACK
90-100'
GRADE CHANGE
±130' NEW FILL
(BULKHEAD TO CAISSON EDGE)
±40'
PLATFORM
±105'
ZONE 1:
TRANSPORTATION CORRIDOR
ZONE 2:
PUBLICLY ACCESSIBLE FLOOD PROTECTION ZONE
±170' BULKHEAD TO NEW PLATFORM


200 Wall St
Old Slip
Gateway
Wall Street
Terminus
Overlook
Waterfront
get-down
Downtown
Docks

UP THE GAME FOR INFRASTRUCTURE DESIGN

THE BIG U
PHASE 1: EAST SIDE COASTAL RESILIENCY

NYC Mayor's Office of Recovery and Resiliency

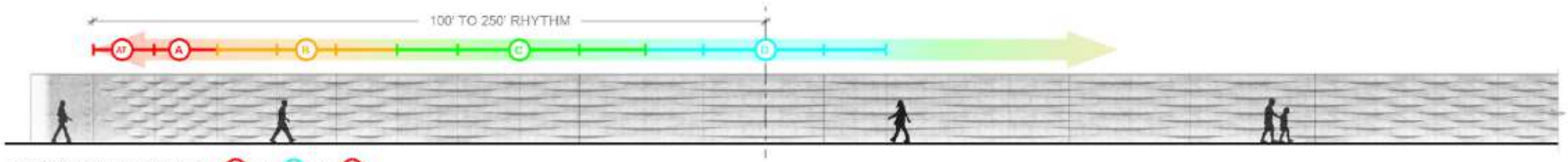
NYC DDC Department of Design and Construction

NYC Parks

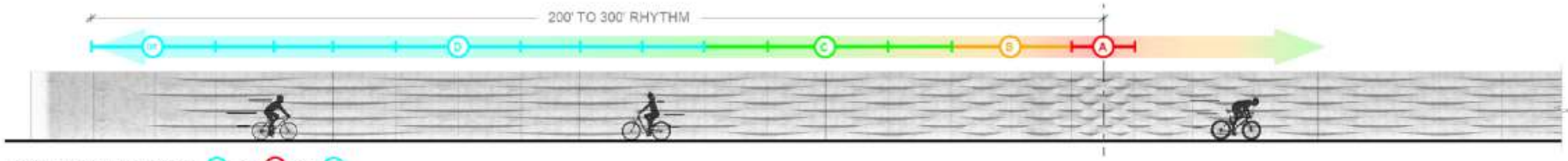
NEW YORK CITY DOT

NYC Environmental Protection

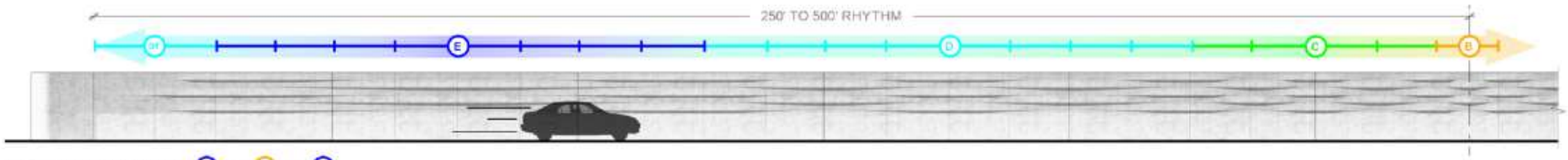
East Side Coastal Resilience (courtesy BIG/ONE Architecture & Urbanism/MNLA)



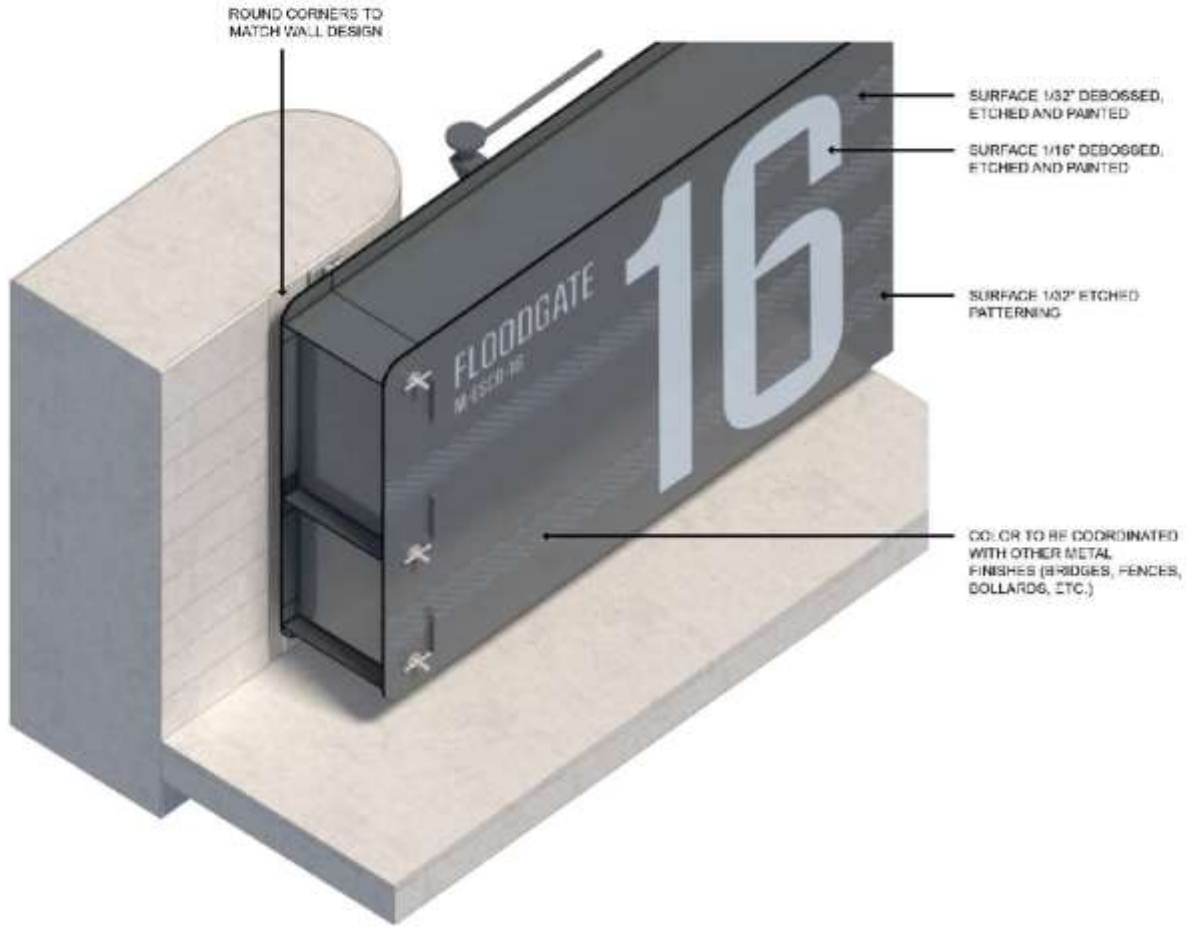
PEDESTRIAN RHYTHM: A ↔ D ↔ A

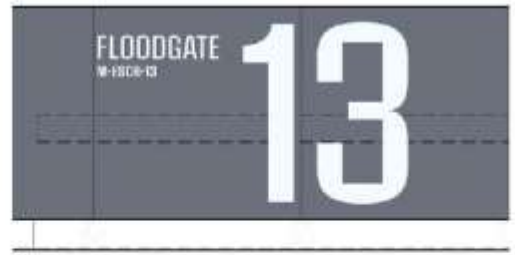


BIKE PATH RHYTHM: D ↔ A ↔ D

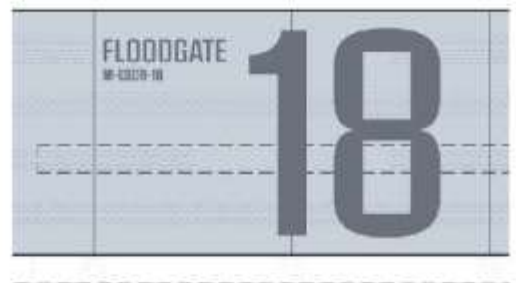


HIGHWAY RHYTHM: E ↔ B ↔ E





TEXT + LABELING
MUNSEL GREY PAINT (TYP)



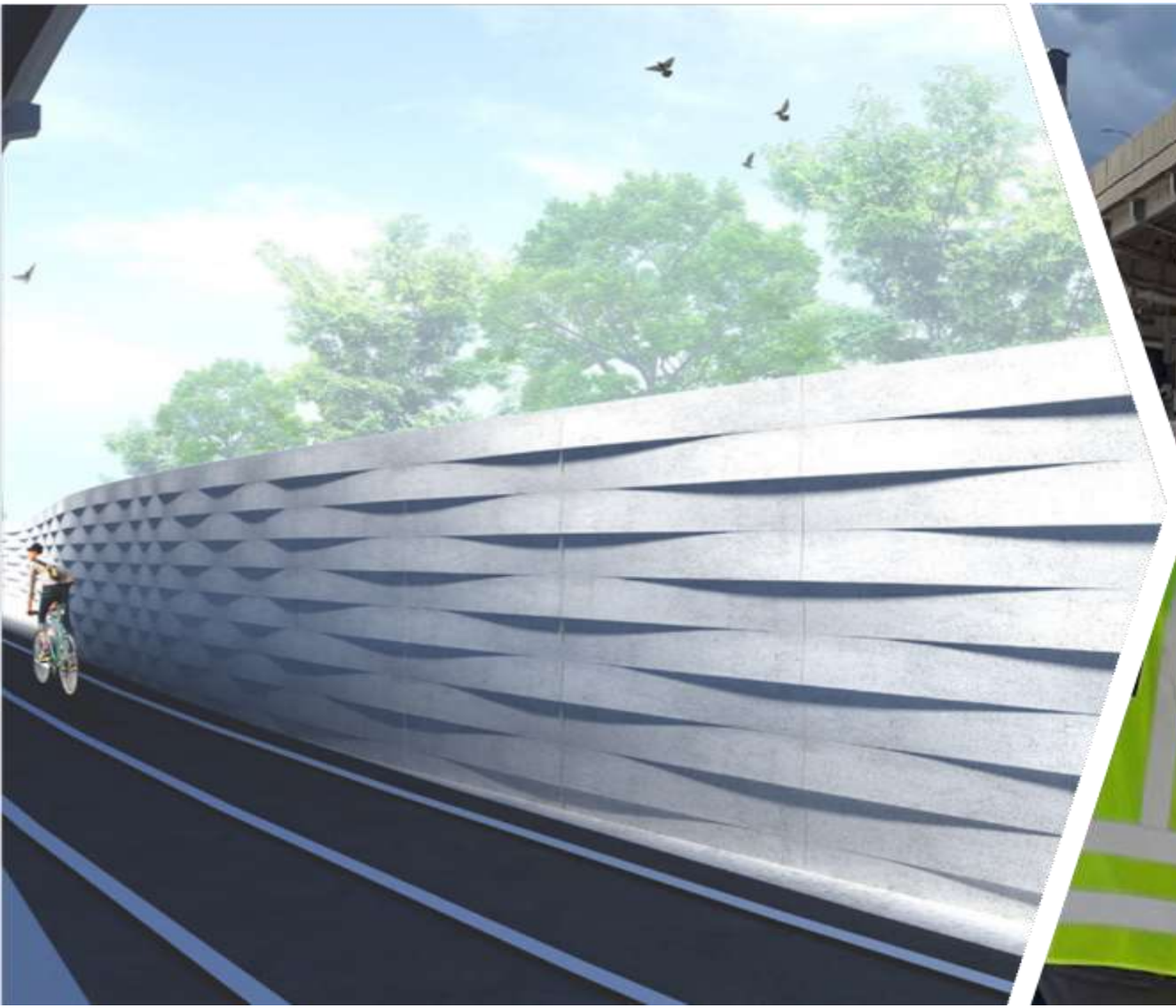
TEXT + LABELING
GW GREY PAINT (ASSER LEVY)

TYPICAL SWING GATE (PIER 42)

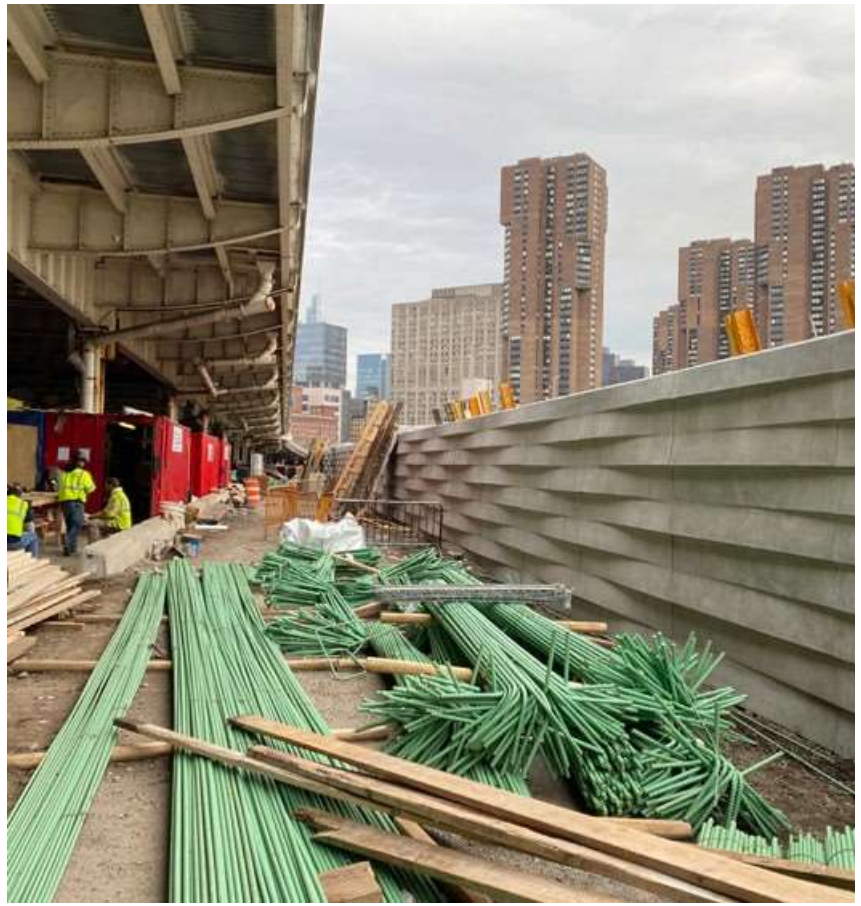
TYPICAL ROLLER GATE (STUY COVE SOUTH)

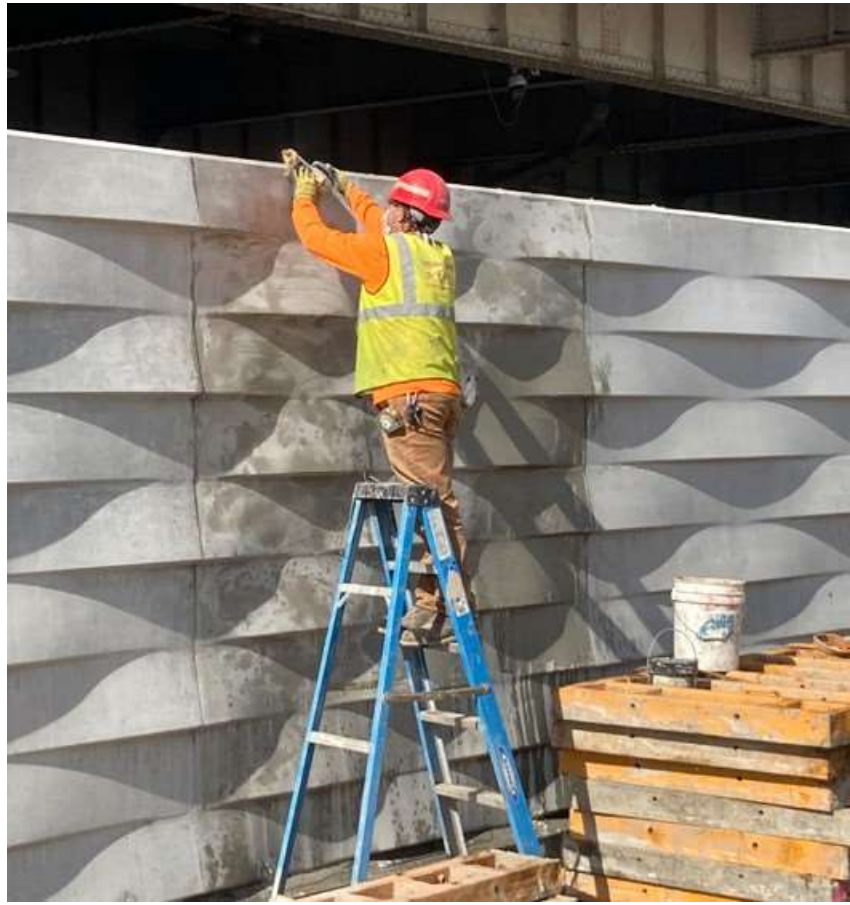
RETAINING WALL
GATE POCKET

ROLLER GATE WITHIN ASSER LEVY PLAYGROUND




WORK SAFE
PCC



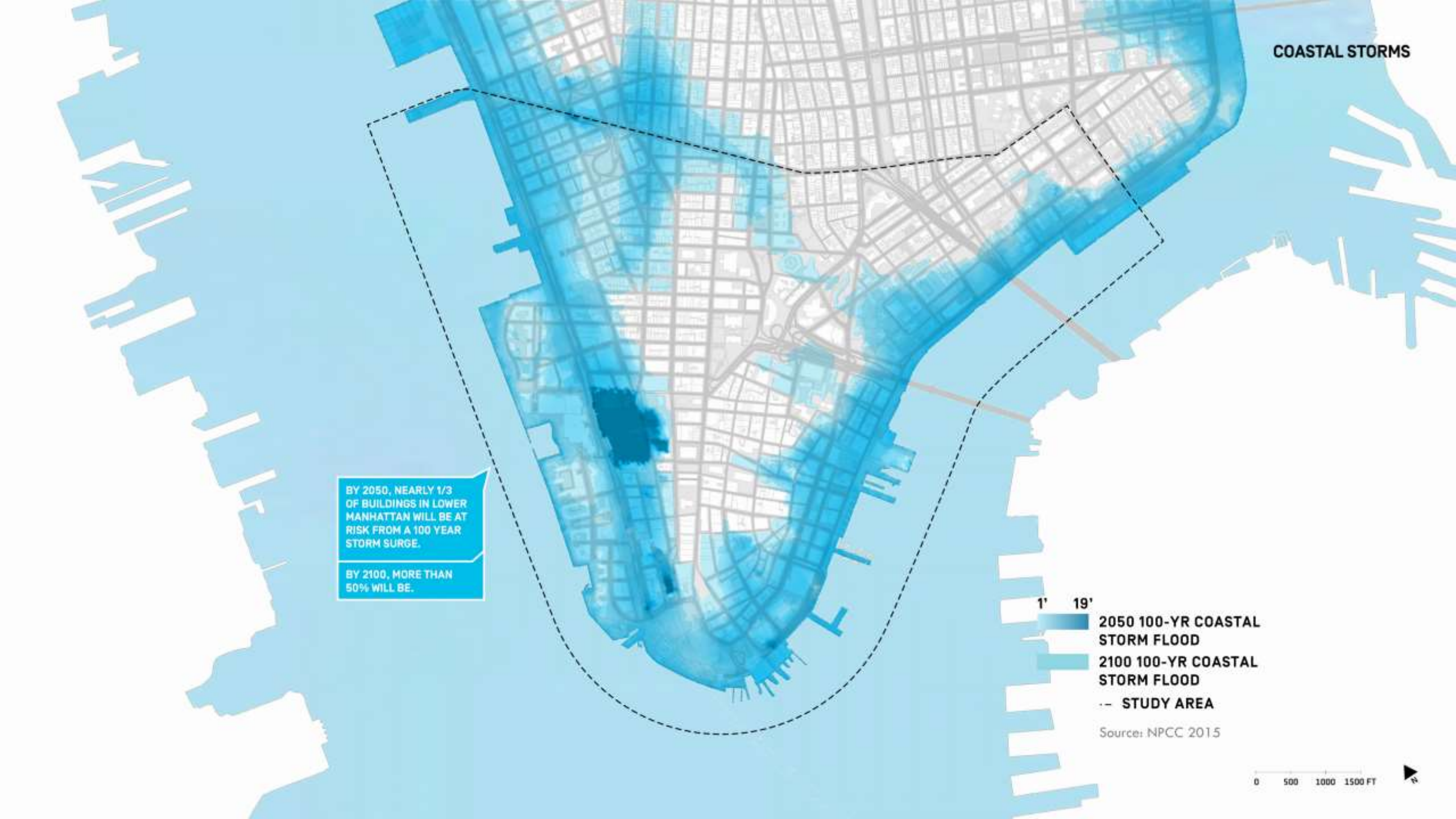


ESCR construction (photo by Dean Moses)

DEVELOP A CULTURE OF LEARNING

FiDi and Seaport

Climate Resilience Plan

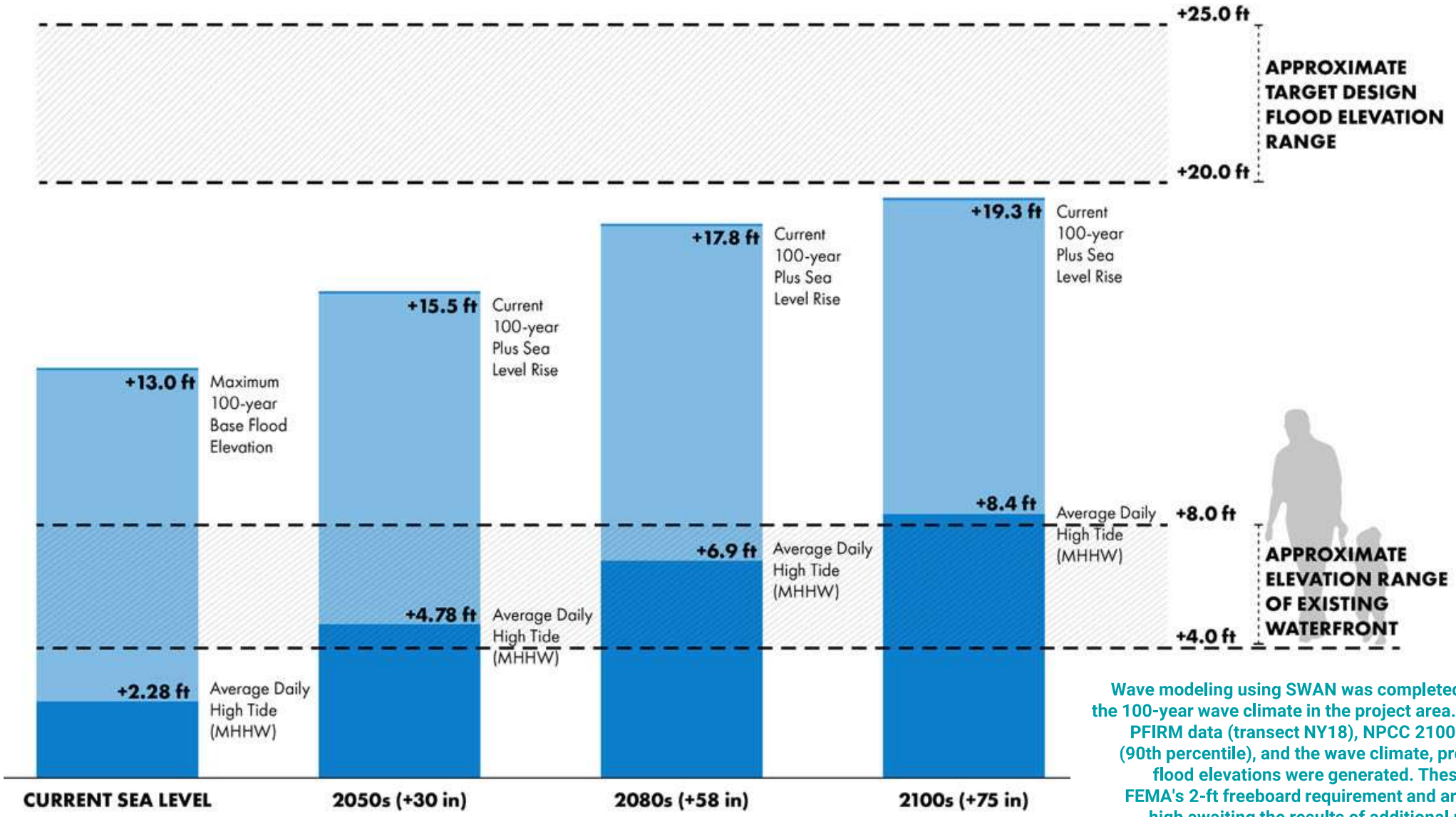

COASTAL STORMS
BY 2050, NEARLY 1/3 OF BUILDINGS IN LOWER MANHATTAN WILL BE AT RISK FROM A 100 YEAR STORM SURGE.
BY 2100, MORE THAN 50% WILL BE.
1'
19'
2050 100-YR COASTAL STORM FLOOD
2100 100-YR COASTAL STORM FLOOD
STUDY AREA
Source: NPCC 2015
0
500
1000
1500 FT

URBAN DESIGN AND INFRASTRUCTURE

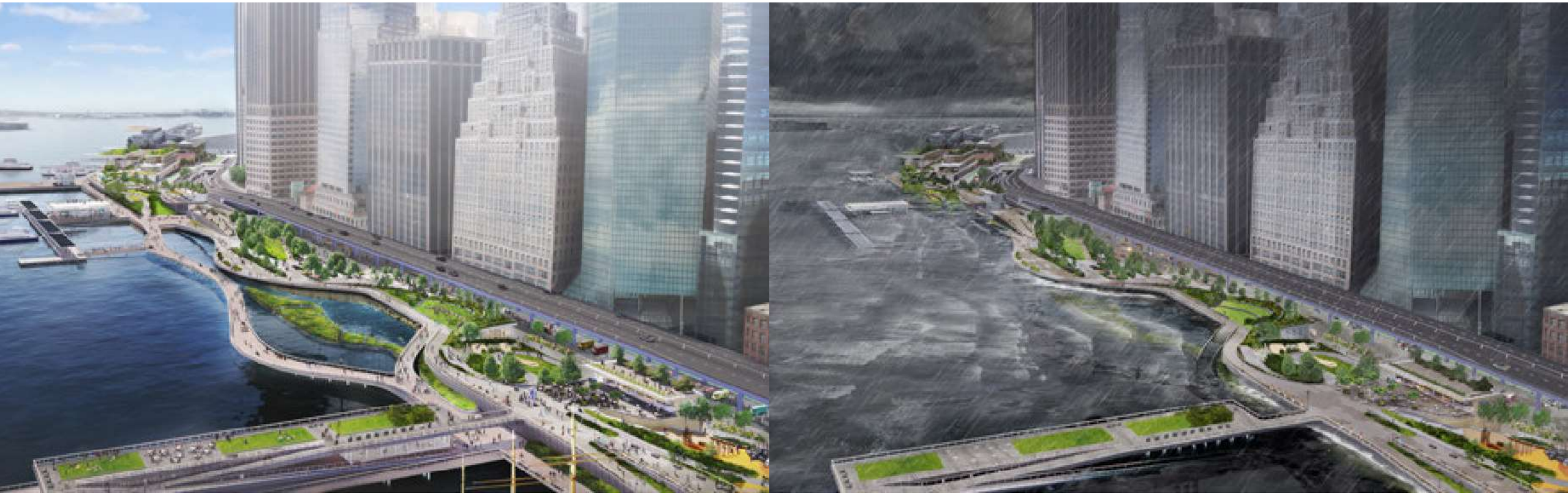
Fidi-Seaport Resilience Master Plan

Coastal Defense

Preliminary Design Flood Elevation Targets



Wave modeling using SWAN was completed to characterize the 100-year wave climate in the project area. Based on FEMA PFIRM data (transect NY18), NPCC 2100 SLR projections (90th percentile), and the wave climate, preliminary design flood elevations were generated. These values include FEMA's 2-ft freeboard requirement and are conservatively high awaiting the results of additional modeling and an overtopping analysis.



FiDi-Seaport Climate Masterplan (courtesy ONE Architecture & Urbanism/Scape)


CAFE


2100
2080s
We will need to build capacity within actors.

DESIGN IS A TOOL FOR RISK REDUCTION

FiDi and Seaport

Climate Resilience Plan

Funding & Financing Strategy
August 2023

NYC EDC | NYC Mayor's Office of Climate & Environmental Justice | ARCADIS

IMPLEMENTATION ROADMAP

Implementing this project will require securing approvals, seeking multiple funding sources, and timely construction.

Regulatory

- Coordinating with key agencies through the Aquatic Resources Advisory Committee
- Estimating potential in-water footprint and mitigation needs

Construction

- Development of technically feasible and constructable project design
- Estimating project timeline and development of phasing strategy

Funding and Financing

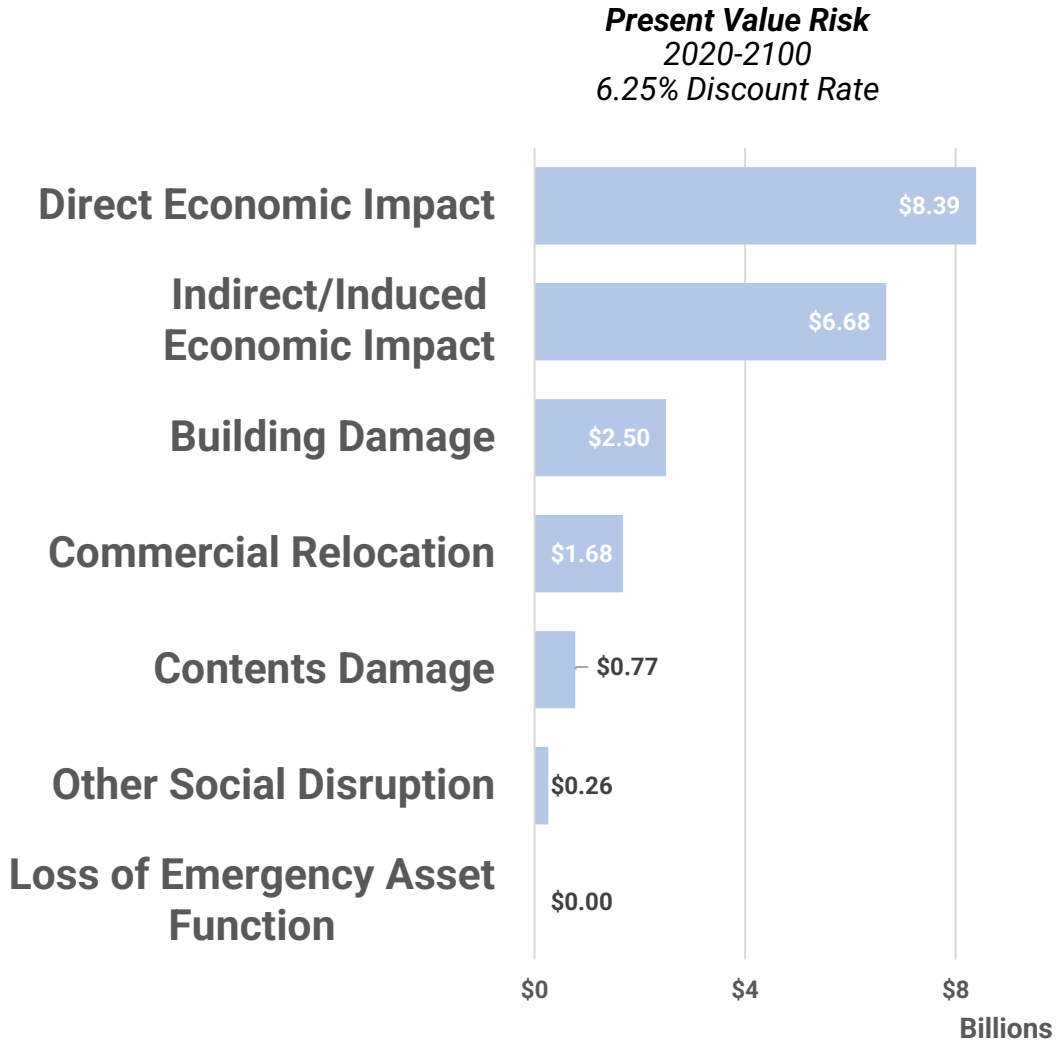
- Exploring wide range of new and existing funding sources
- Identification of implementation pathways for prioritized sources
- Ongoing delivery coordination with the U.S. Army Corps of Engineers

ARCADIS

COSTS OF INACTION

If the Fidi Seaport project is not implemented…
From now until 2100, the cumulative costs of repetitive flooding would cause a total of **$20.3B** in **total losses** to the region. This includes:

- **$8.39B** in **direct economic impacts** to businesses in the study area
- **$6.68B** in **indirect & induced economic impacts** to businesses within the NY MSA
- **$2.50B** in **building damages**
- **$1.68B** in **relocation costs**
- **$770M** in **contents damage**
- **$264M** in **social disruption**, including health costs from injuries and mental stress, and lost income due to health issues
- **$20k** in losses due to **emergency asset function disruption**

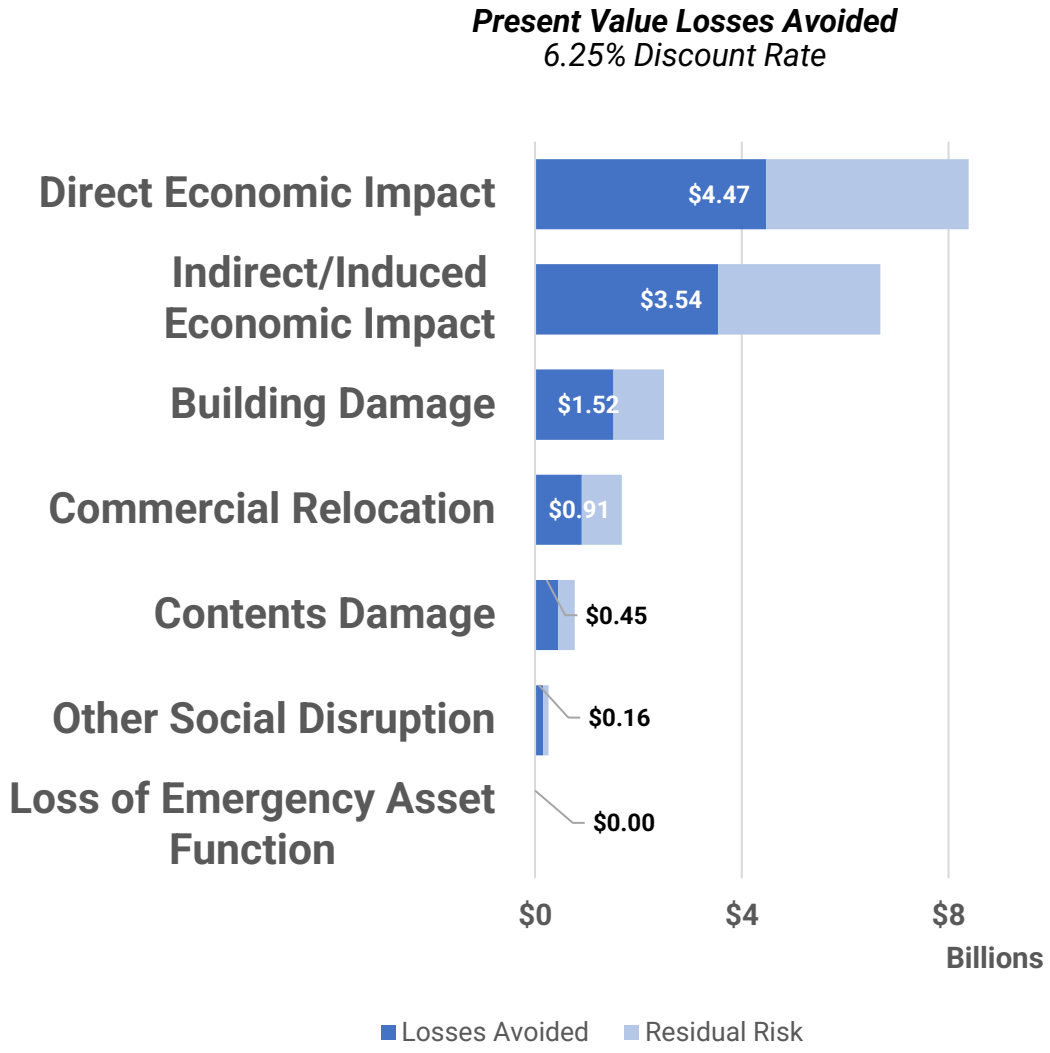


ARCADIS

PROJECT BENEFITS

If implemented, this project would avoid **$11.05B** in losses to the region. This includes:

- **$4.47B** in **direct economic impacts** to businesses in the study area
- **$3.54B** in **indirect & induced economic impacts** to businesses within the NY MSA
- **$1.52B** in **building damages**
- **$910M** in **relocation costs**
- **$450M** in **contents damage**
- **$160M** in **social disruption**, including health costs from injuries and mental stress, and lost income due to health issues
- **$2.5k** in losses due to **emergency asset function disruption**



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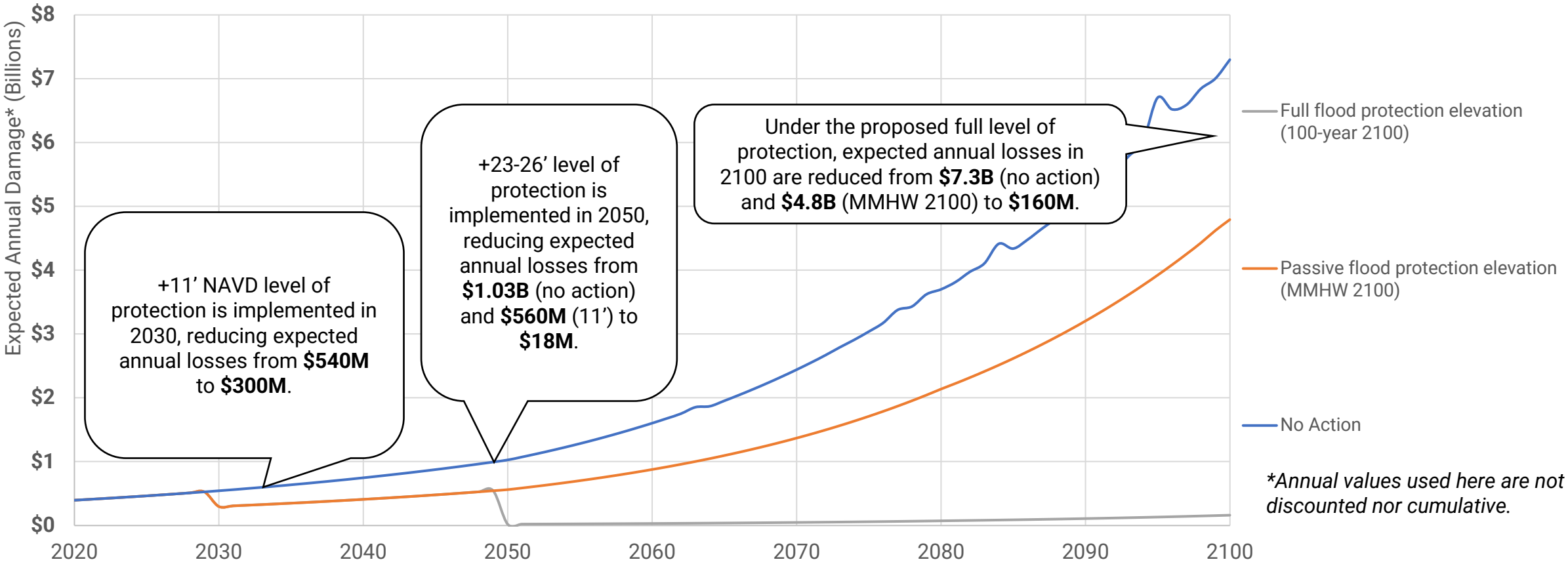
PROJECT BENEFITS OVER TIME

The project is anticipated to be phased over time, with an earlier phase intended to protect from lower-level storms and high tides followed by a final stage to protect from more extreme storms. The chart below shows how these phases would reduce risk over time.



**Annual values used here are not discounted nor cumulative.*

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DIRECT PHYSICAL DAMAGES

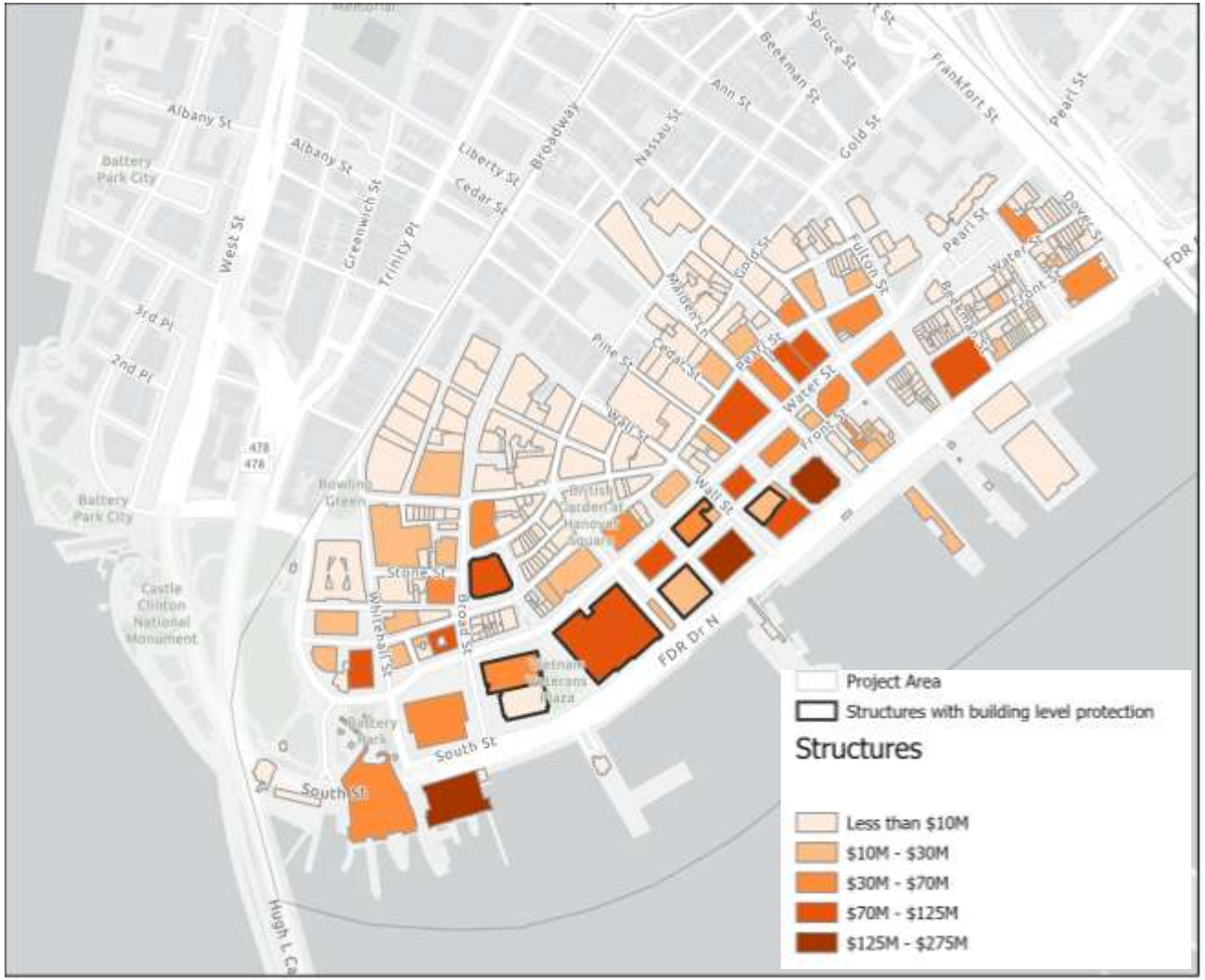
Direct physical damages will impact many structures closest to the waterfront and along the primary flood pathways most significantly.

Structures with larger footprints accumulate more damages but may also be better equipped to recover from the damages.

The flood damage modeling accounts for the building level protections and therefore reflects less damages for those structures. Many structures one or two blocks back from the waterfront, especially along Water Street, have not implemented any building level adaptation (as far as known) and are some of the most at risk to accrue damages with a present value greater than $70M per building. [1]

[1] All values shown use a 6.25% discount rate and consider the time period from 2020-2100. These losses are included in present value damages reported in the summary slides.

Direct Physical Damage



* Color scheme shown factors in building level protection

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WHO BENEFITS?

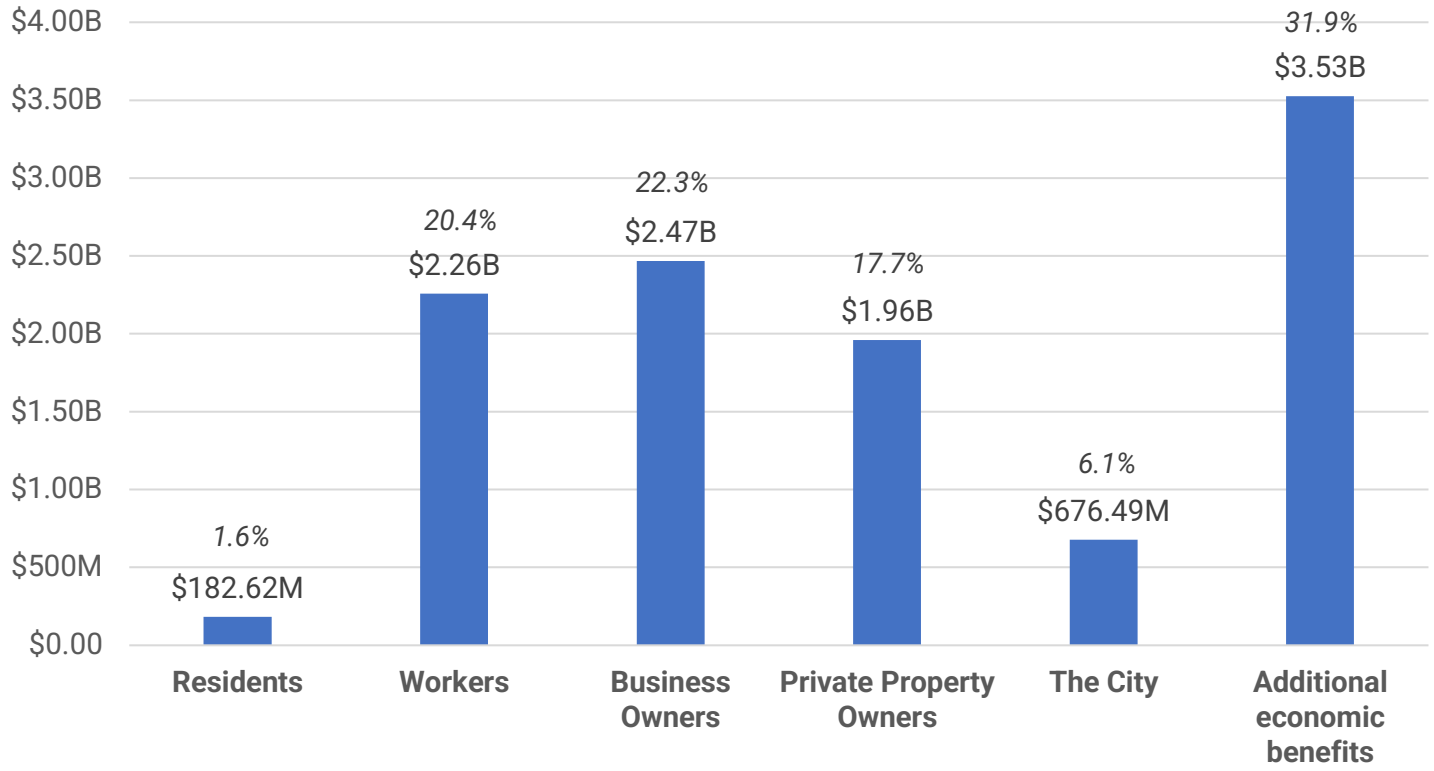
The largest share of present value benefits due to losses avoided is to **business owners and workers** in the project area and region.

Private property owners in the project area will also accrue substantial present value benefits, while **the City** will save $676M in avoided direct impacts and lost revenue.

While accounting for a smaller proportion of total present value benefits, the $183M in benefits to **residents** will likely yield substantial benefits for each of the about 14,000 residents exposed to flooding in the area.

A number of additional benefits due to avoided loss of emergency, community, and transportation service function will also accrue as benefits to **commuters**, residents, workers, and **other users** of the project area (however many of these benefits are not able to be calculated as present value losses).

Summary of Present Value Benefits
(6.25% Discount Rate)



Note: This benefit-share calculation allocates **$7.54 billion** out of the total $11.05 billion present value losses avoided as benefits to specific parties. $3.53 billion of the total present value losses avoided are not captured here due to methodology limitations in determining benefitting parties. This $3.53 billion is mostly comprised of IMPLAN (economic) intermediate inputs, direct Federal and State tax impacts, indirect/induced regional tax impacts, unallocated benefits to the Seaport Museum, and small differences in local loss of tax revenue due to limiting the region of impact for taxes to NYC for the benefits-share analysis only.

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FUNDING SOURCES/IMPLEMENTATION PATHWAYS

	Sources
Federal	▪ **USACE Civil Works**
	▪ **FEMA**
	▪ **Capital Investment Grant**
	▪ **Infrastructure for Rebuilding America (INFRA) and Rebuilding American Infrastructure with Sustainability and Equity (RAISE) Grants**
State/local	▪ **New York State Environmental Bond Act**
	▪ **Insurance Surcharge**
	▪ **Resilience Assessment DIstrict**
	▪ **Stormwater Fee**
	▪ Revenue from new development (residential, office)

Thank you!

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Urban and Community Resilience

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