



lower manhattan
COASTAL RESILIENCY

**TWO BRIDGES
WORKSHOP NO. 1 : RE ENGAGEMENT
JULY 27, 2016, PS 184**

AGENDA

- 6:30 – 6:40pm **Welcome + Opening Remarks** (10 mins)
- 6:40 – 6:50pm **OneNYC: Our Resilient City** (10 mins)
- 6:50 – 7:00pm **Project Overview** (10 mins)
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- 7:15 – 8:05pm **Key Considerations + Small Group Discussions** (50 mins)
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VISION

The Lower Manhattan Coastal Resiliency (LMCR) Project aims to reduce flood risk due to coastal storms and sea level rise from Manhattan's Two Bridges neighborhood through Battery Park City. It intends to build the physical, social, and economic resiliency of the area by integrating flood protection into the community fabric through strengthening the City's coastline while improving access to the waterfront and enhancing public spaces.

OneNYC: RESILIENCY

Following Hurricane Sandy, a global conversation on resiliency emerged. Here's what it means to us in New York City.

Our Resilient City

Our neighborhoods, economy, and public services will be ready to withstand and emerge stronger from the impacts of climate change and other 21st century threats

HURRICANE SANDY

TWO BRIDGES



HURRICANE SANDY

TWO BRIDGES



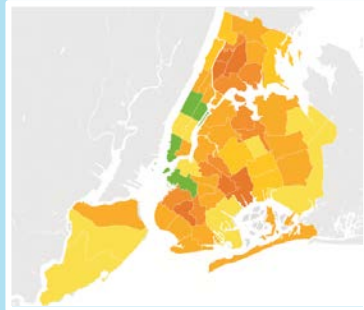
~5' Flood
(Sandy)

CLIMATE CHANGE / 21ST CENTURY THREATS

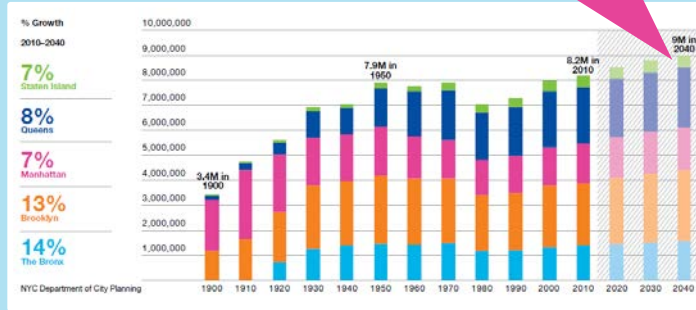
...But we know that Sandy is not the only risk we face. As we look towards the future, we must take stock of our current challenges...



Hurricane Sandy



Increasing Inequality



A Growing Population

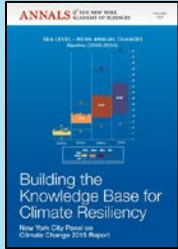


Aging Infrastructure

CLIMATE CHANGE / 21ST CENTURY THREATS

...And grapple with the impacts of climate change on our city.

The NYC Panel on Climate Change (NPCCC) projects increased chronic climate hazards...



By the 2050s:

- + 4.1°F to 5.7°F increase in average temperature
- + 4% to 11% increase in average annual precipitation
- + Sea levels likely to rise 1-2 ft.; maybe 2½ ft.

By 2100:

- + High-end projections may reach 6 ft.

...and increased impact from extreme weather events.



By the 2050s:

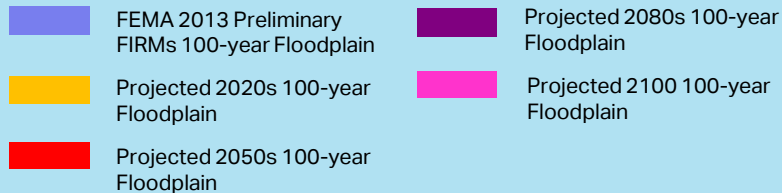
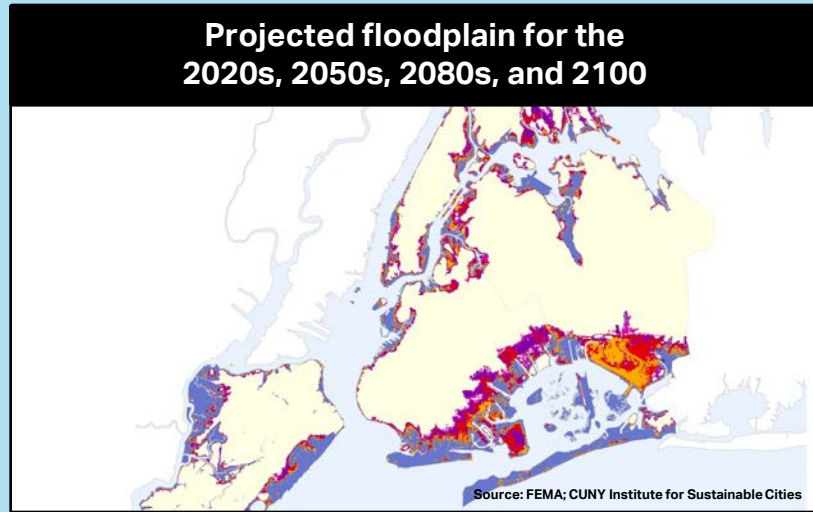
- + Number of days in NYC above 90° could triple
- + Number of most intense hurricanes and associated extreme winds may increase

Even today:

- + 100-year floodplain expanded by 17 square miles (51%) citywide; 2.3 ft. average increase in 100-year flood elevations; will increase with further sea level rise; now encompasses 71,500 structures

SEA LEVEL RISE AND STORM SURGE

The City's 520 miles of coastline is vulnerable to flooding from coastal storms.



100-YEAR FLOODPLAIN*

	2013 PFIRMs	2050s Projected	Change (%)
Residents	400,000	808,900	102%
Jobs	290,800	555,700	91%
Buildings	71,500	118,000	65%
1-4 Family	57,400	89,000	55%
Floor Area (Sq Ft.)	534M	855M	42%

* Numbers are rounded for clarity

Over 171,000 Buildings And 1.2 Million New Yorkers Projected To Live In The Floodplain By 2100.

OneNYC: OUR FOUR VISIONS

On April 22nd, 2015 Mayor Bill de Blasio released a new long-term strategic plan to address our most pressing challenges.

Our
Growing,
Thriving City

Our Just and
Equitable City

Our
Sustainable
City

Our
Resilient
City

OneNYC: OUR RESILIENT CITY

This plan builds on existing efforts and strengthens and expands the City's commitment to a multilayered approach to resiliency.



Neighborhoods

Every city neighborhood will be safer by strengthening community, social, and economic resiliency



Buildings

The city's buildings will be upgraded against changing climate impacts



Infrastructure

Infrastructure systems across the region will adapt to enable continue services



Coastal Defense

New York City's coastal defenses will be strengthened against flooding and sea level rise

PLANNING EFFORTS

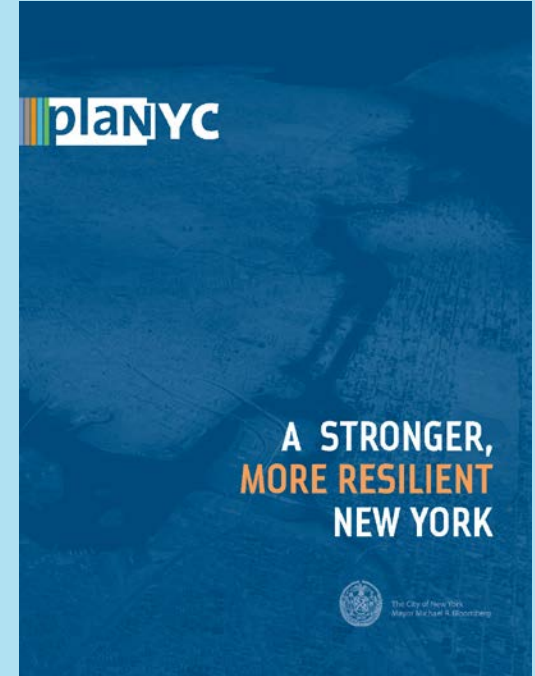
Building off of recommendations from previous resiliency plans



**REBUILD
BY
DESIGN**



#ONENYC



lower manhattan
COASTAL RESILIENCY

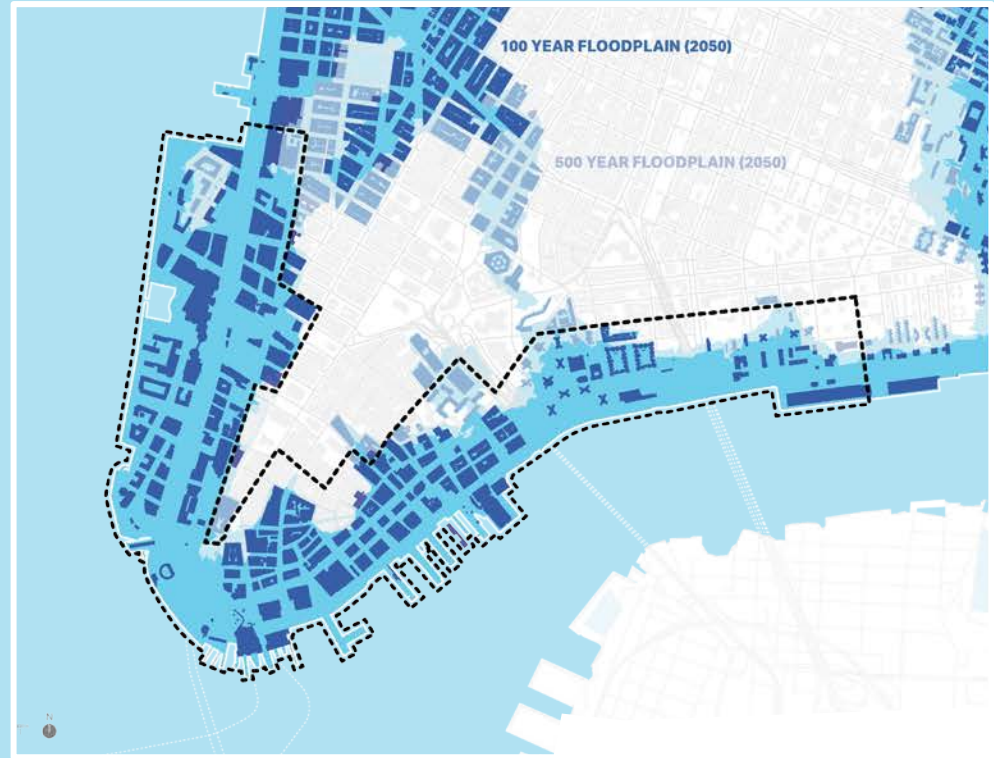
PROJECT OVERVIEW

Purpose of Study:

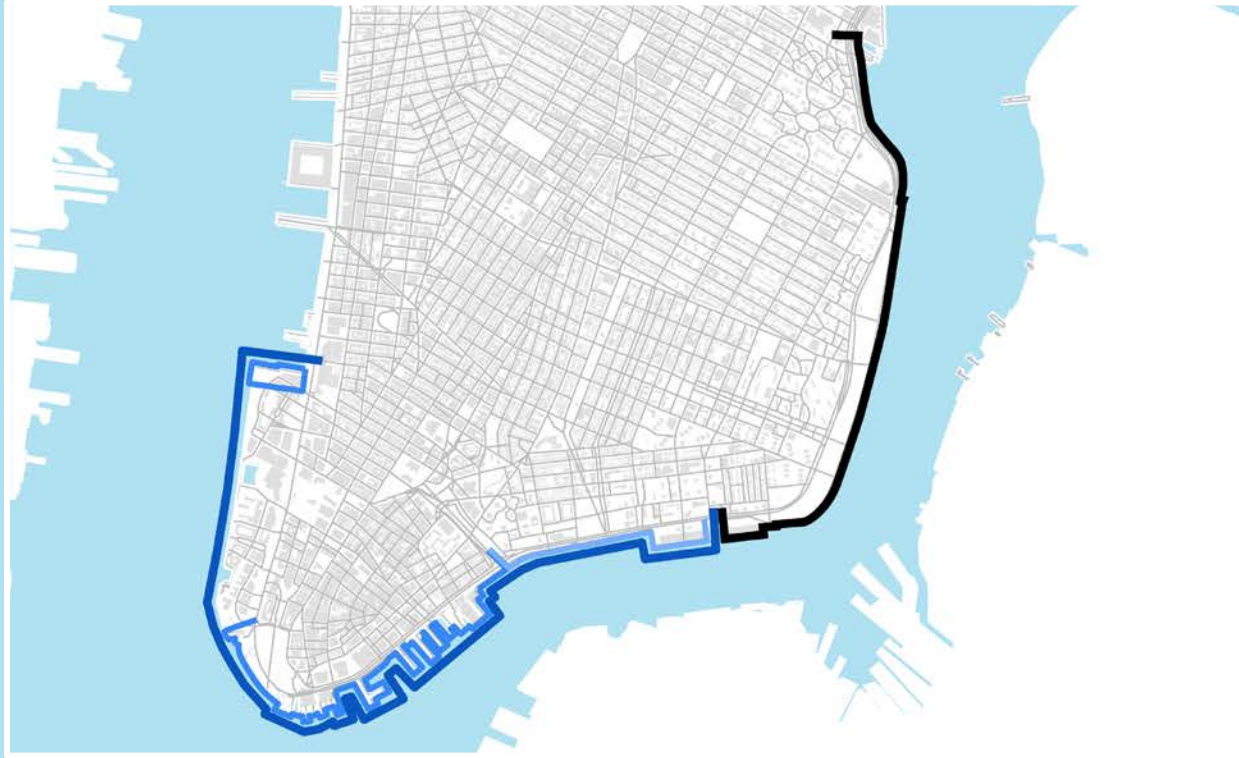
1. Develop long-term strategy and feasible concept design for all of Lower Manhattan
2. Prioritize project concepts toward implementation and conduct advanced planning when possible
3. Engage with community on core design principles and priorities

Study Funding:

- + \$7.25M CDBG-DR
(\$3.75M GOSR; \$3.5M NYC)



IMPLEMENTATION FUNDING IN PLACE



East Side Coastal Resiliency

Funding Secured :

\$335 million (CDGB-DR)

\$170 million (City Capital)

Project Budget : \$505 million

Lower Manhattan Coastal Resiliency Implementation :

Two Bridges

Funding Secured :

\$176 million (CDGB-NDR)

\$27 million (City Capital)

Project Budget : \$203 million

Manhattan Tip

Funding Secured :

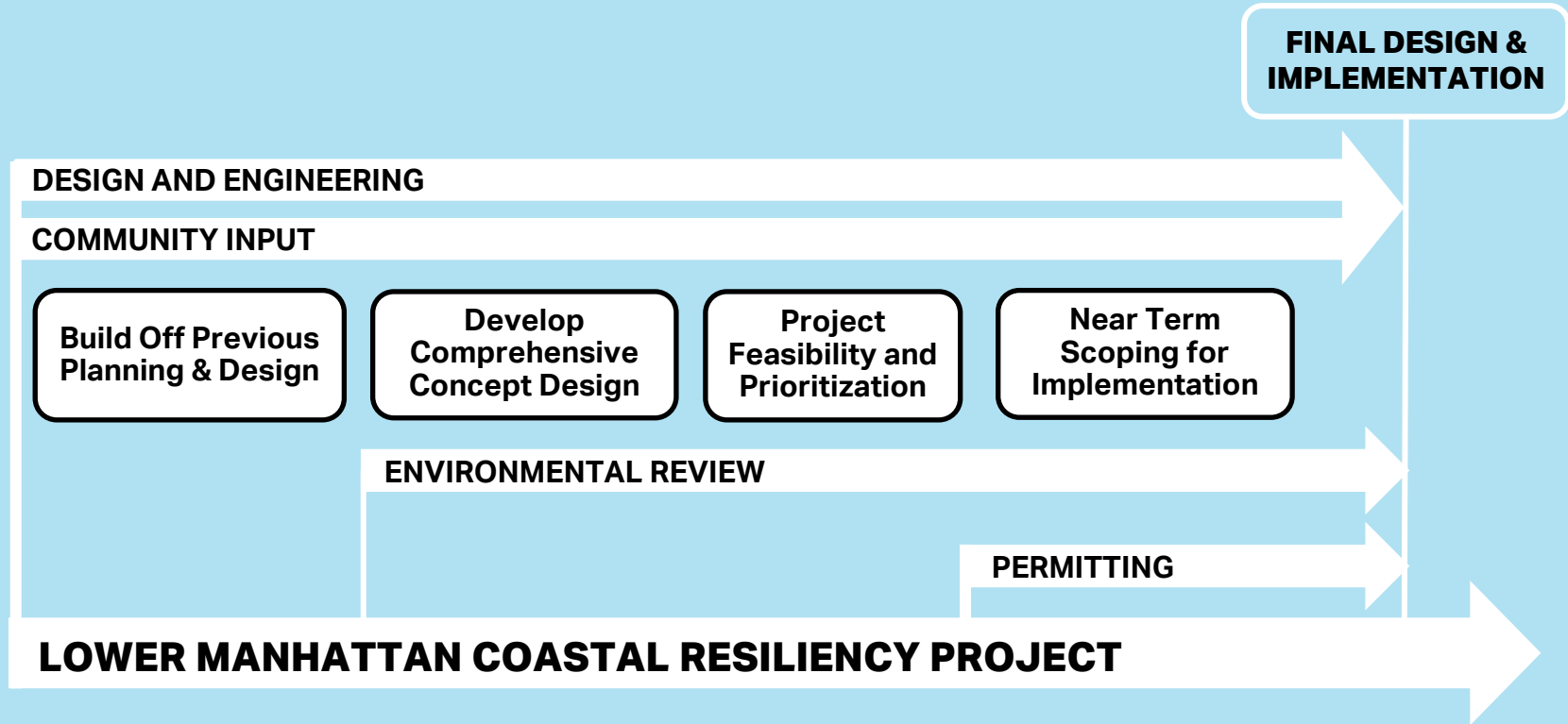
\$108 million (City Capital)

Project Budget : TBD

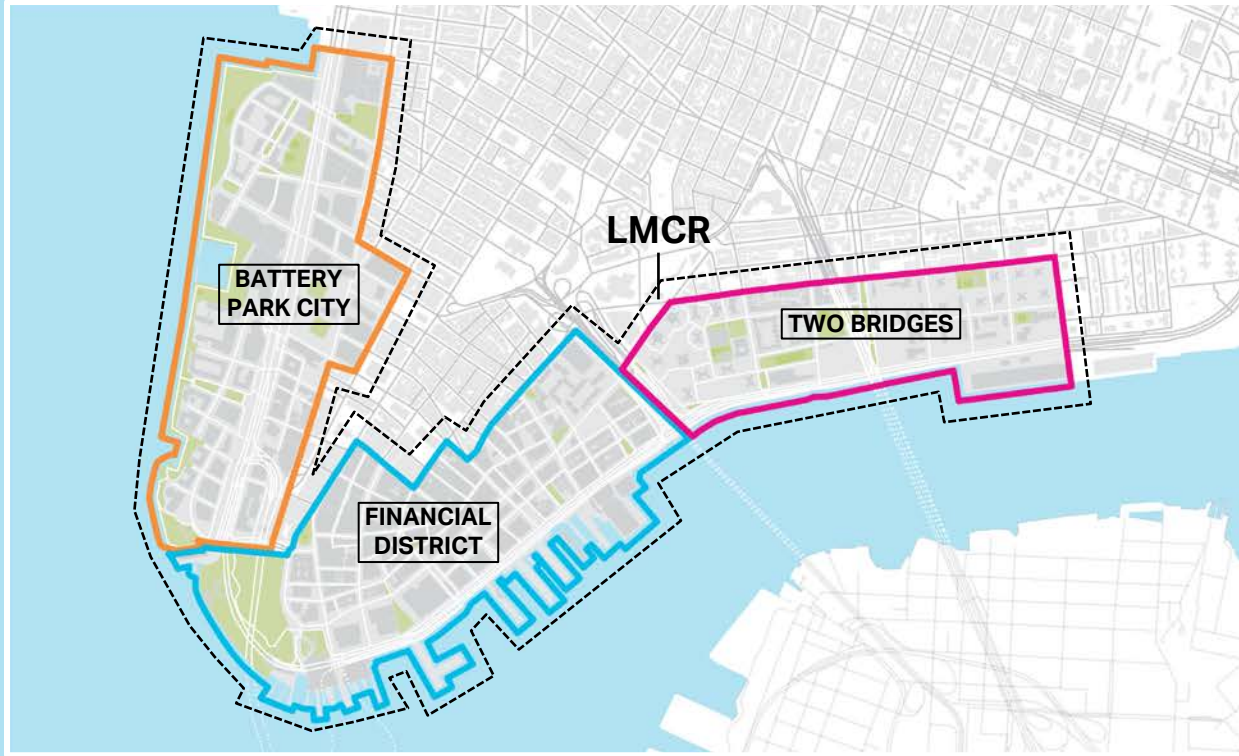
PROJECT LOGIC & ACTIVITIES



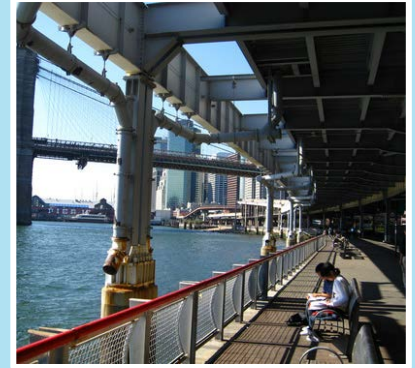
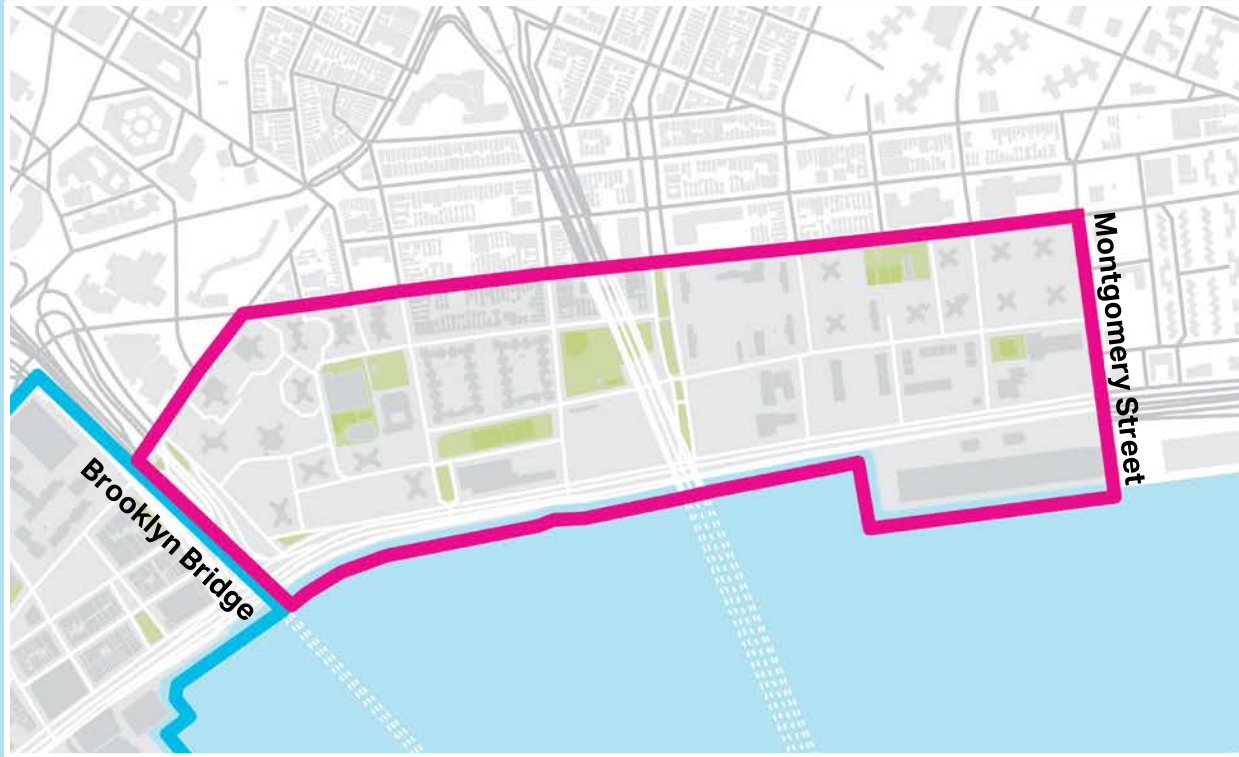
PROJECT PROCESS



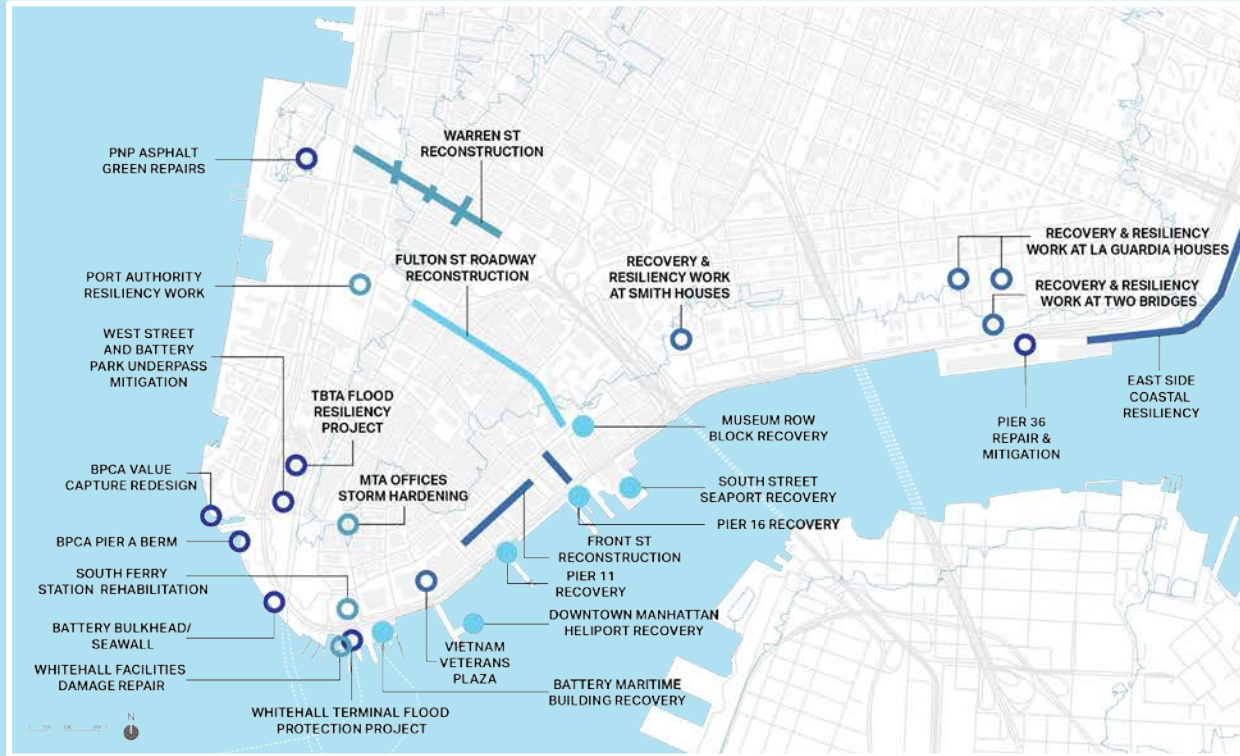
PLANNING STUDY AREA



TWO BRIDGES STUDY AREA

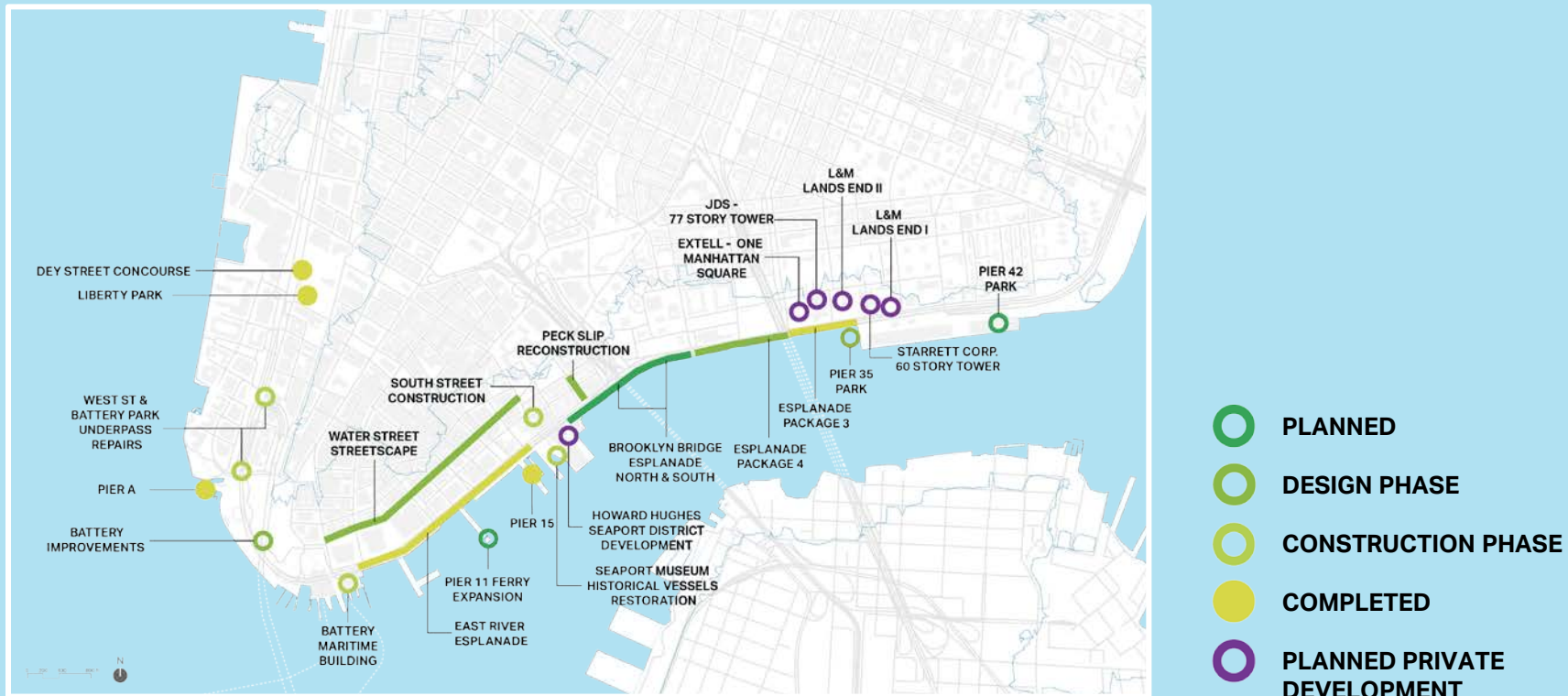


ADJACENT RESILIENCY PROJECTS



- PLANNED
- DESIGN PHASE
- CONSTRUCTION PHASE
- COMPLETED

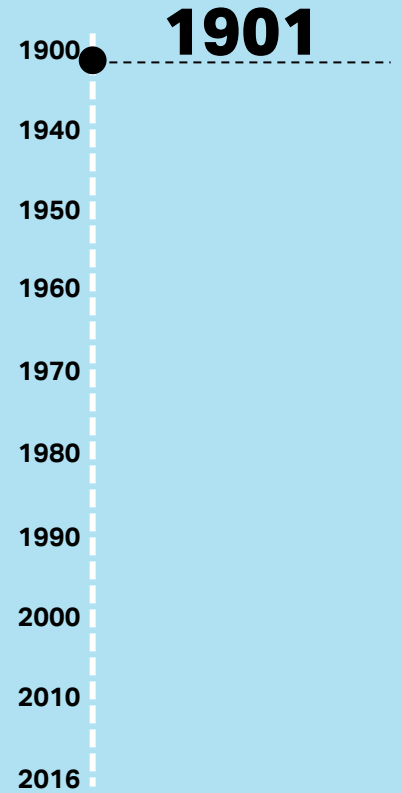
ADJACENT WATERFRONT IMPROVEMENT PROJECTS



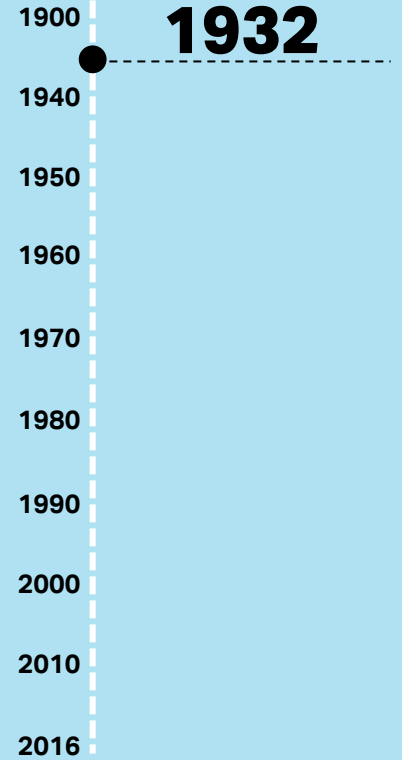
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EAST RIVER PORTS



SOUTH STREET



SOUTH STREET UNDER THE FDR



1900

1940

1950

1960

1970

1980

1990

2000

2010

2016

1982

EAST RIVER ESPLANADE UNDER THE FDR



1900

1940

1950

1960

1970

1980

1990

2000

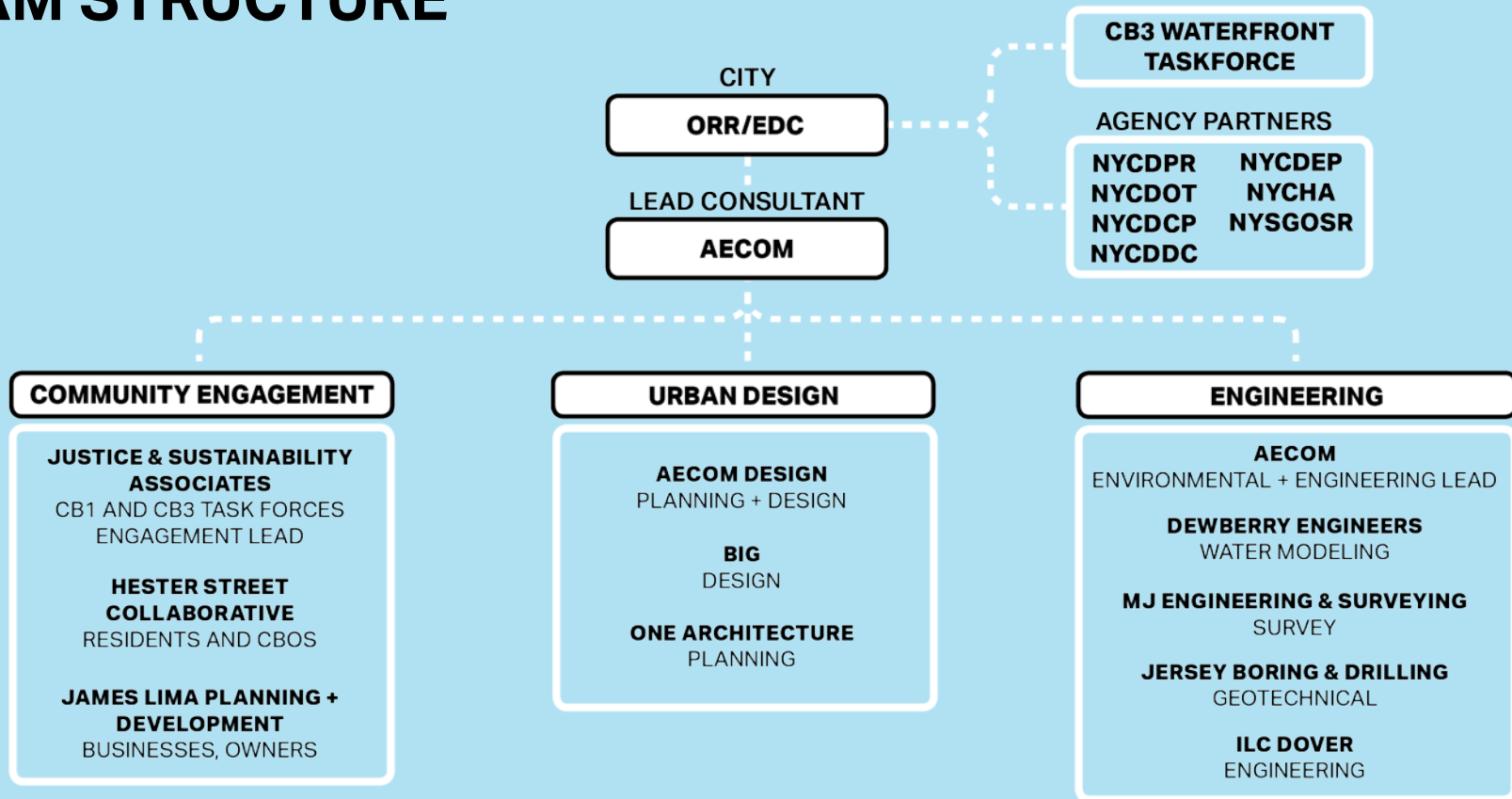
2010

2016

2012

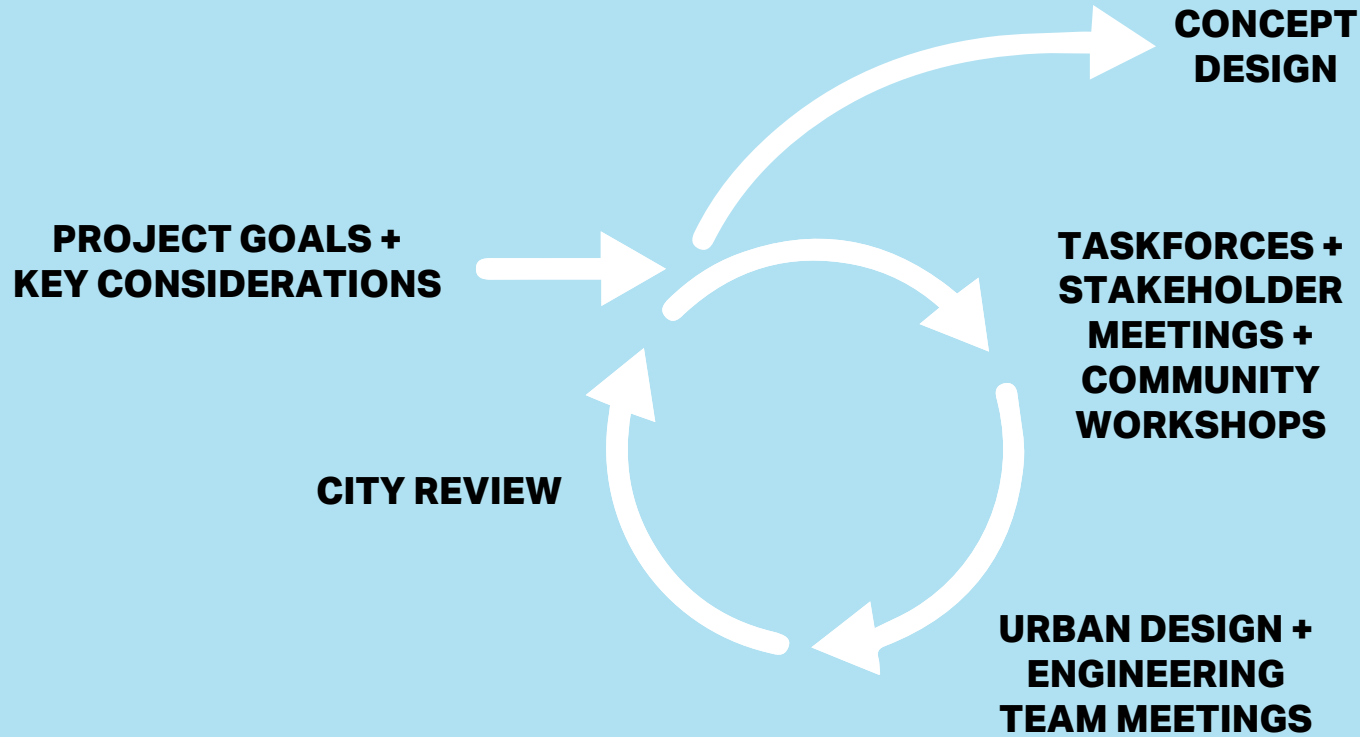
TEAM STRUCTURE

TEAM STRUCTURE



COLLABORATIVE PROCESS

HOW ARE WE GOING TO WORK TOGETHER?



ENGAGEMENT METHODS – MEETING TYPES



- + Public Workshops
- + Informal Engagement
- + Stakeholder Interviews
- + Focus Groups
- + Surveys
- + Walking/Biking tours

AGENDA

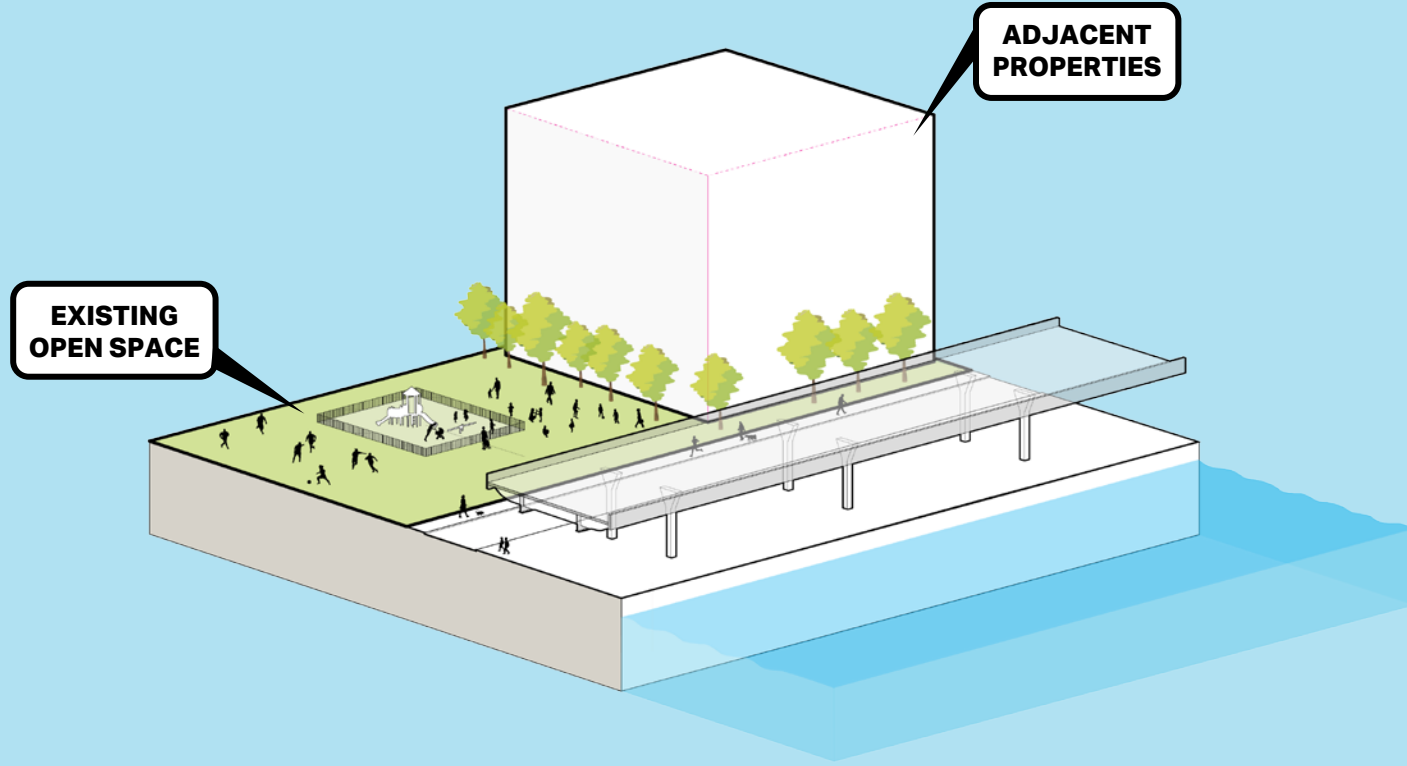
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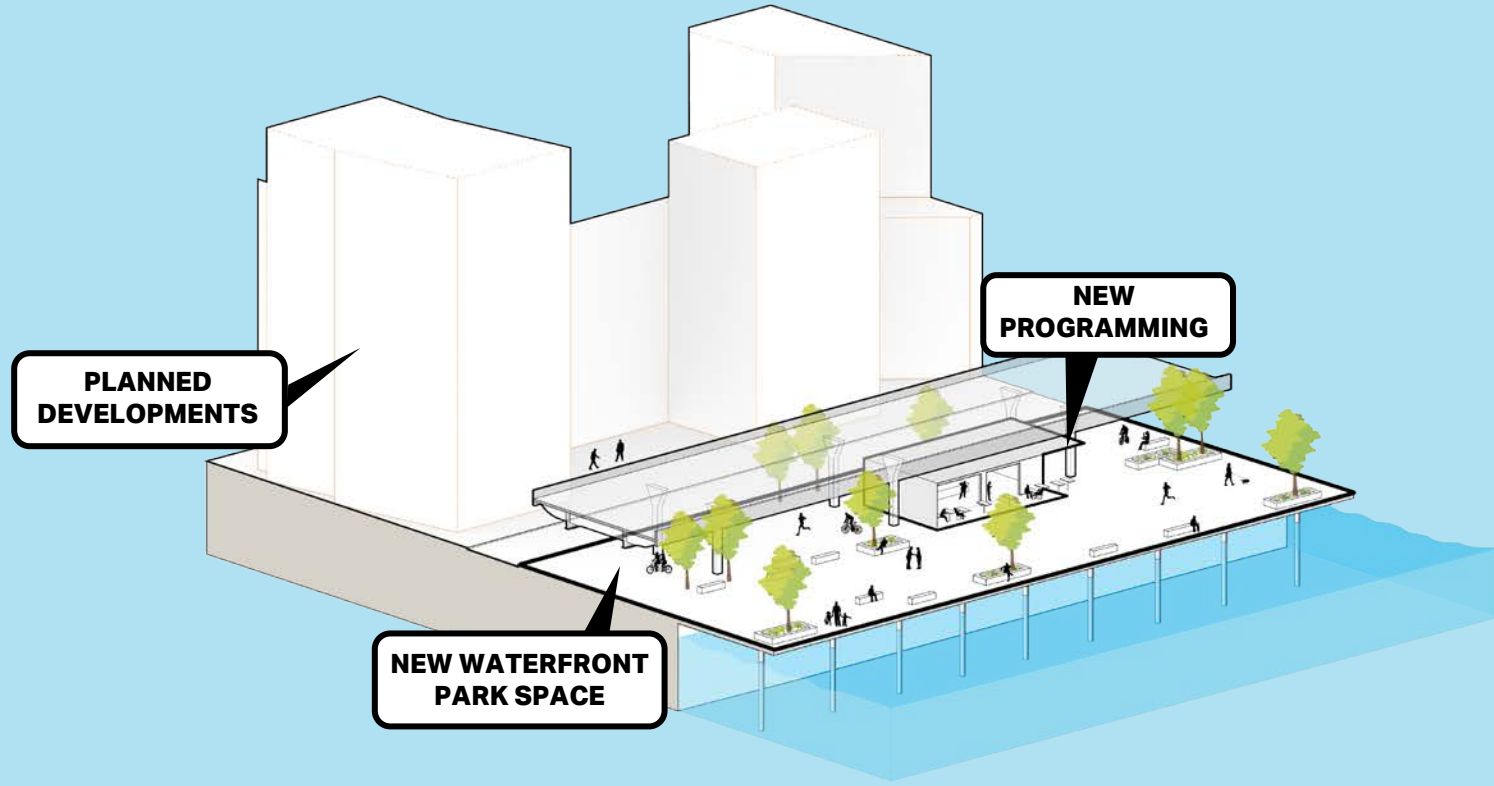
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KEY CONSIDERATIONS

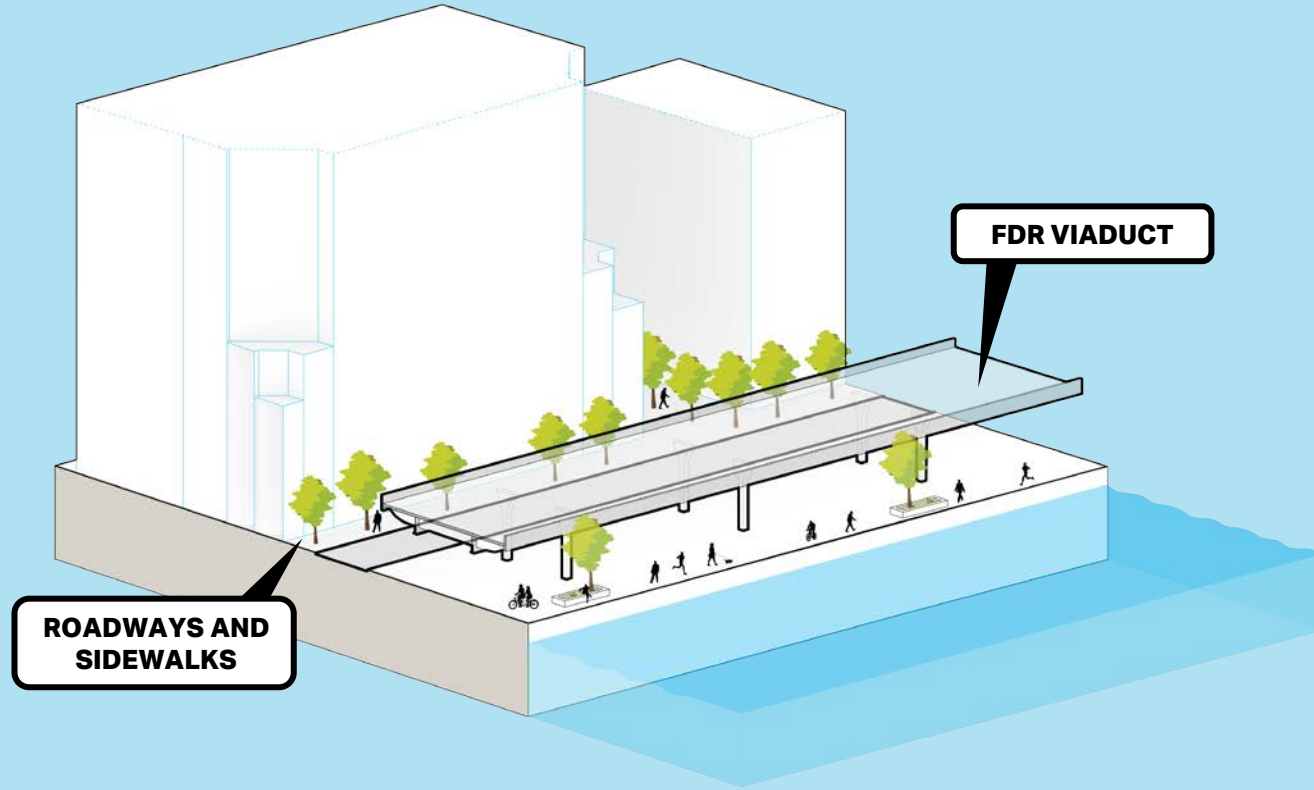
ADJACENT USES



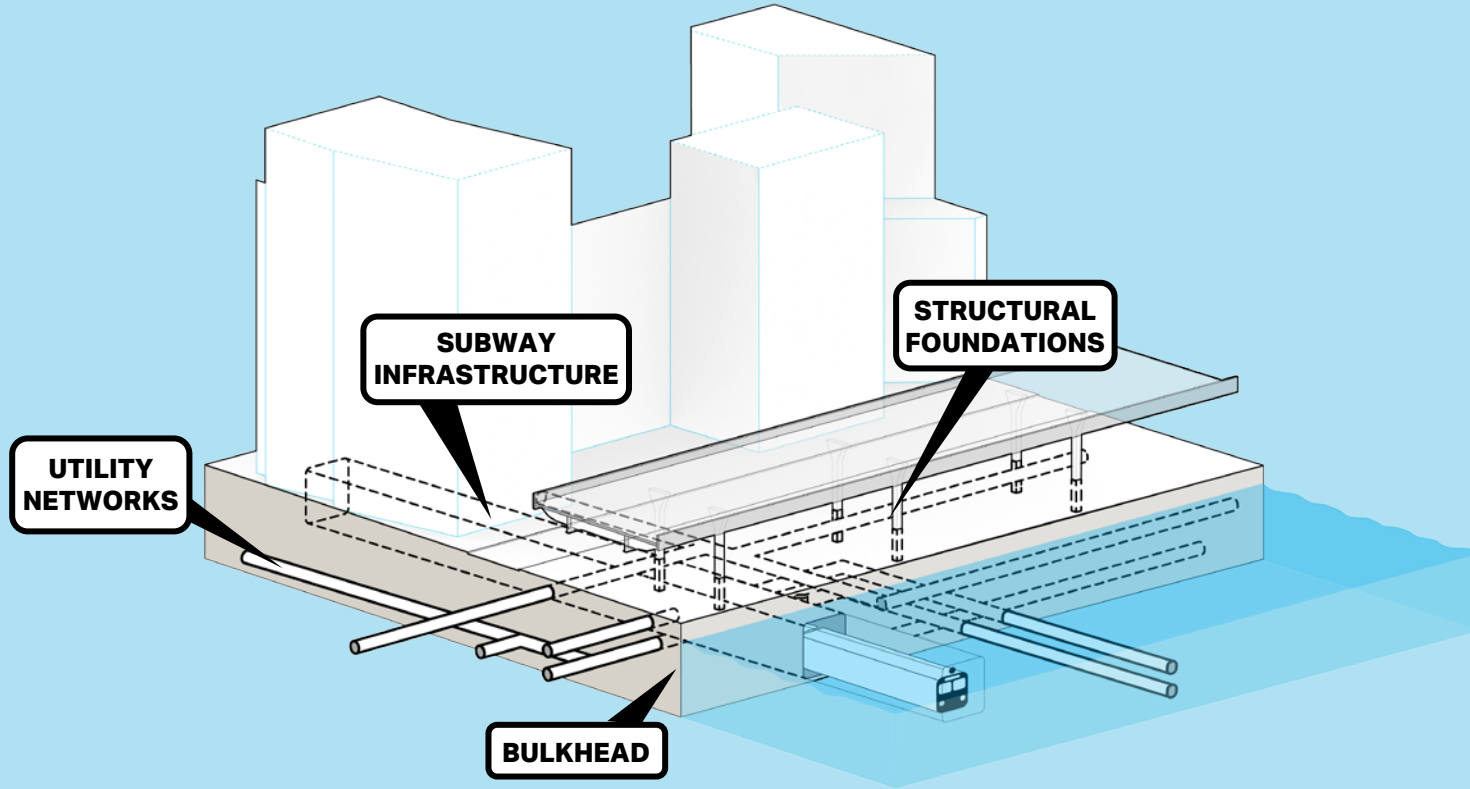
NEW AND PLANNED IMPROVEMENTS



CIRCULATION AND TRANSPORTATION

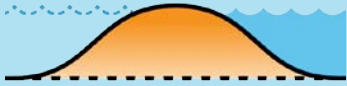


UNDERGROUND

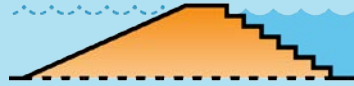


TYPES OF COASTAL RESILIENCY INFRASTRUCTURE

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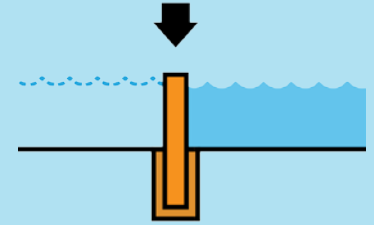
**EARTHEN
BERM**



**URBAN
BERM**



**FLOOD
WALL**



DEPLOYABLES



**ELEVATED
STREET**



**RAISED
MEDIAN**



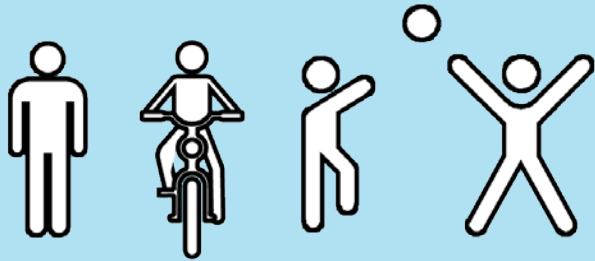
**ELEVATED
PATHWAYS**



**RAISED
PLANTERS**

SOCIAL INFRASTRUCTURE

HOW DOES RESILIENCY INFRASTRUCTURE BENEFIT PEOPLE?



PEOPLE

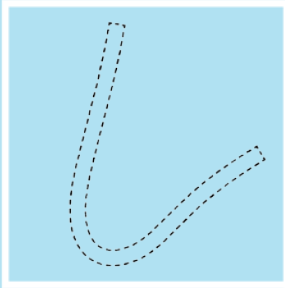


RESILIENCY
INFRASTRUCTURE

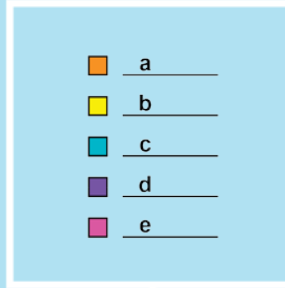
ENGAGEMENT TIMELINE

OPPORTUNITIES TO PARTICIPATE

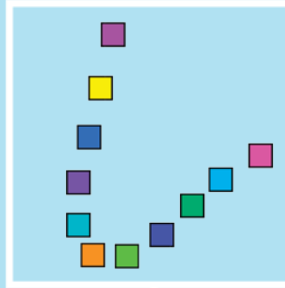
WORKSHOP 1
RE-ENGAGEMENT



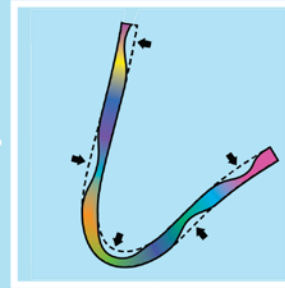
WORKSHOP 2
TOOLKIT



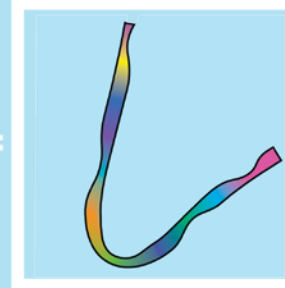
WORKSHOP 3
SELECTION



WORKSHOP 4
REFINEMENT



PRESENTATION & NEXT STEPS
FINAL CONCEPT



DESIGN AND ENGINEERING

COMMUNITY INPUT

STAKEHOLDER MEETINGS / INFORMAL MEETINGS / POP-UP WORKSHOPS

CB3 TASKFORCE MEETING #1
SUMMER 2016

CB3 TASKFORCE MEETING #2
FALL 2016

CB3 TASKFORCE MEETING #3
WINTER 2016/17

CB3 TASKFORCE MEETING #4
SPRING 2017

CB3 TASKFORCE MEETING #5
SUMMER 2017

CB3 TASKFORCE MEETING #6
FALL 2017

CB3 TASKFORCE MEETING #7
WINTER 2017/18

CB3 TASKFORCE MEETING #8
SPRING 2018

PUBLIC WORKSHOP

PUBLIC WORKSHOP

PUBLIC WORKSHOP

PUBLIC WORKSHOP

PUBLIC PRESENTATION

FINAL DESIGN + IMPLEMENTATION

SMALL GROUP DISCUSSIONS

HOW WILL YOUR INPUT SHAPE THE PROJECT?

WORK SESSION 1: 30 minutes

Coastal Resiliency Infrastructure Types – Priorities and Concerns

WORKSHEET 1:

TWO BRIDGES RE-ENGAGEMENT WORKSHOP
COASTAL RESILIENCY INFRASTRUCTURE TYPES

EARTHEN BERM



- Built with **bank and heel**, made of natural elements such as stone, soil, geotextiles, grass, etc.
- Allows for **walkway access and passive recreation** (not sports)
- Best suited for areas with a **large amount of space**
- **Modular, permanent and in place** – changes their form, during and after flood events
- **Design and periodic maintenance** must be able to support **significant weight**

URBAN BERM



- Can be designed with **more attractive bank and heel**
- Combines a variety of **bank elements** and accessories (benches, seats, ramps, lighting, etc.) that can **integrate walkway access and passive recreation**
- Can include **elements** such as benches, lighting, art work and **recreational equipment**
- Best suited for areas with a **large amount of space**
- **Modular, permanent and in place** – changes their form, during and after flood events
- **Big and heavy** – stack up to a level of **weight** that requires
- **Design and periodic maintenance** must be able to support **significant weight**

FLOOD WALL




- Can be **in-place** or **made in-situ**, depending on what it has an **attached bank and heel**
- Can include **elements** such as benches, lighting, artwork, etc.
- Best suited for areas with **limited space**
- **Modular, permanent and in place** – changes their form, during and after flood events
- Requires structures that get **deep underground** (i.e., need to be **deeply** designed and **engineered** underground structures to allow for **deep foundations**)
- **Relies on the strength of the soil** to transfer flood forces, as well as the **foundations** to prevent the wall from being pushed over

DEPLOYABLE



- **Modularized** **retardant elements** and **access** under normal weather conditions
- Best suited for **tight spaces** that are **accessible** for ongoing **maintenance** and **operation** and have **underground conditions** that allow for structures at **ground level or below**
- **Temporary** (can be used only in the event of an emergency)
- **Specialized custom systems** that **require frequent maintenance**
- Some include **retardant** **padding** and **underpinning** **needed** when in **use** in the event of an emergency and **require storage** **space** off site

EXAMPLES

 Green Acres Park, Larchmont, New York	 Green Acres Park, Larchmont, New York	 8th Avenue, New York City
 Green Acres Park, Larchmont, New York	 Green Acres Park, Larchmont, New York	 8th Avenue, New York City
 8th Avenue, New York City	 8th Avenue, New York City	 8th Avenue, New York City
 8th Avenue, New York City	 8th Avenue, New York City	 8th Avenue, New York City

HOW WILL YOUR INPUT SHAPE THE PROJECT?

WORK SESSION 2: 20 minutes

Community Priorities

WORKSHEET 2:

**RE-ENGAGEMENT WORKSHOP
COMMUNITY PRIORITIES**

STEP 1
Which priorities listed below matter most to you? Add any that you think are missing.

STEP 2
Rank the priorities in order of importance using the bull's eye Diagram.

FUNCTIONALITY **DESIGN** **USES + ACTIVITIES**

most important
select 1
select up to 3
select other priorities

lower manhattan
COASTAL RESILIENCY

NYC Department of City Planning

NYC Department of Parks and Recreation

NYC Department of Transportation



STAY IN TOUCH



www.nyc.gov/lmcr



@NYClimate



@NYClimate



by mail
253 Broadway – 14th Floor



in person



nycresiliency@cityhall.nyc.gov

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STAY IN TOUCH



www.nyc.gov/lmcr



@NYClimate



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by mail
253 Broadway – 14th Floor



in person



nycresiliency@cityhall.nyc.gov