

Detailed Master Plan Design Rationale and Drawings

Financial District & Seaport Climate Resilience Master Plan

May 2022



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1. Overview of the Master Plan – Goals & Concept
2. Design Overview – Design Drivers, Design Opportunities & What Needs Further Technical Study
3. Master Plan Walkthrough

Overview of the Master Plan

Goals & Concept

Master Plan Goals

To protect Lower Manhattan, we must transform this waterfront to be resilient while maintaining its vibrancy and critical functions.

Goals
Ingredients



Protect Lower Manhattan from tidal flooding and coastal storms by



Building **new coastal flood defense infrastructure**



Building **new drainage infrastructure** to manage stormwater



Integrate climate resilience infrastructure into the city by



Ensuring **universal accessibility** and **emergency vehicular connections** to the waterfront and along the shoreline, and a **continuous bikeway**



Constructing **new resilient maritime facilities** to support ferries, historic ships, and other waterfront operations



Limiting impacts to the East River's **ecology** while enhancing habitats where possible



Enhance the public waterfront by



Preserving and enhancing **existing public destinations**



Creating **multi-level waterfront open space**



Providing **community-serving uses**

What is the Financial District and Seaport Climate Resilience Master Plan?

The Financial District and Seaport Climate Resilience Master Plan, published in December 2021, is a shared City-community vision for a resilient 21st-century waterfront. This vision responds to the increasing hazards posed by climate change, while transforming the waterfront to better serve all New Yorkers for generations to come. Grounded in community and regulatory input, climate science, engineering, and feasibility analysis, the master plan reflects an ambitious vision that can be realized. The next step is to advance design and identify the funding to make this master plan a reality.

What is a climate resilience master plan?

This master plan is not set in stone, but rather is intentionally flexible so it can adapt to future needs and priorities.

The master plan:

- Is a guiding document for long-term decision-making
- Is grounded in extensive community engagement
- Demonstrates what this area could look like in the future

What's next?

As a next step, the City will advance the design process and work closely with the community and regulators throughout future phases of work. While the master plan presents a comprehensive vision for a resilient 21st-century waterfront, some elements of the master plan will require further study before advancing design.

Introduction

This document is intended to supplement the Financial District and Seaport Climate Resilience Master Plan by:

1. Documenting and clarifying which elements of the master plan are more fixed, flexible, or will require more technical study.
2. Provide a more detailed walkthrough of the 2021 master plan documenting the proposed location of the flood defense infrastructure, waterfront structures, and potential configuration of public open spaces.

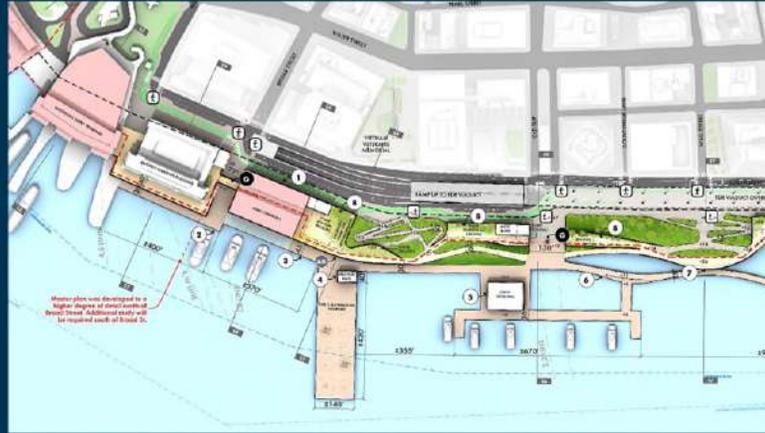


December 2021 Financial District and Seaport Climate Resilience Master Plan

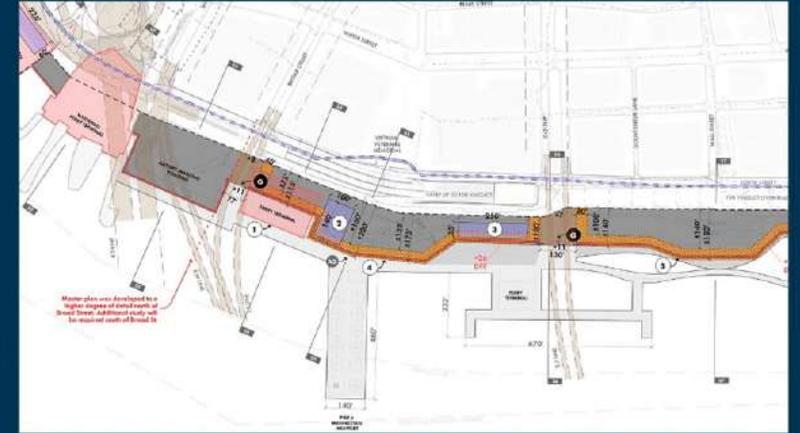
Understanding the Master Plan through Images



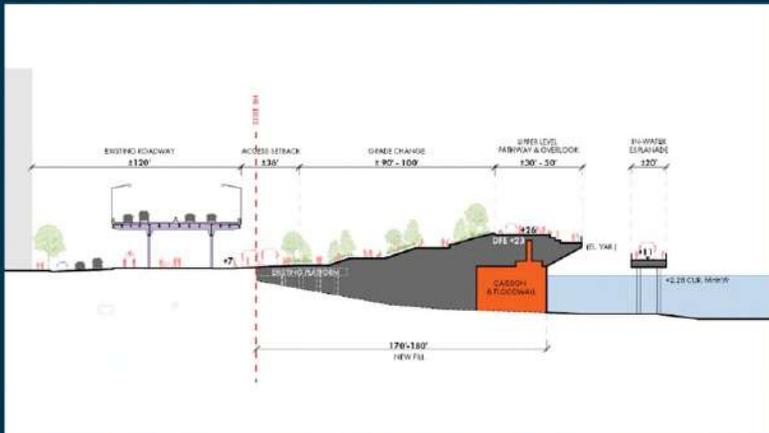
1. Bird's Eye Rendering: Proposed future conditions of the site including the flood defense alignment.



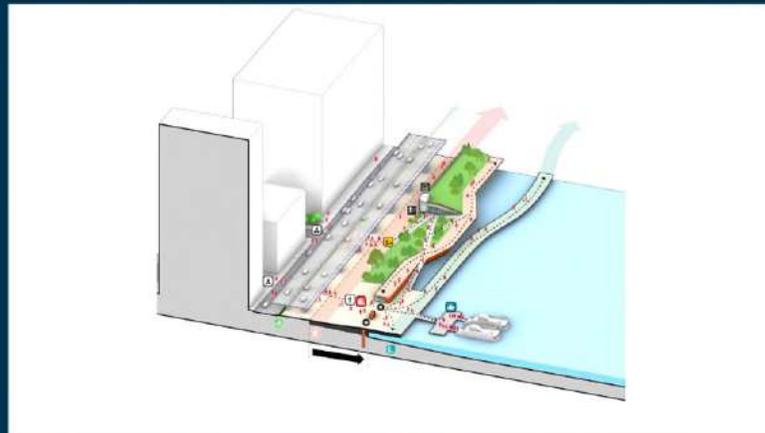
2. Illustrative Plan: Lays out the conceptual site plan and presents additional detail on design elements and dimensions.



3. Flood Defense Detail Plan: Provides conceptual layout and detail about the types and dimensions of waterfront structures and flood defense infrastructure proposed for the site.



4. Cross Section: Provides detail for flood defense recommendations at critical assets.



5. Diagrams: Illustrate important design concepts and elements of the design.

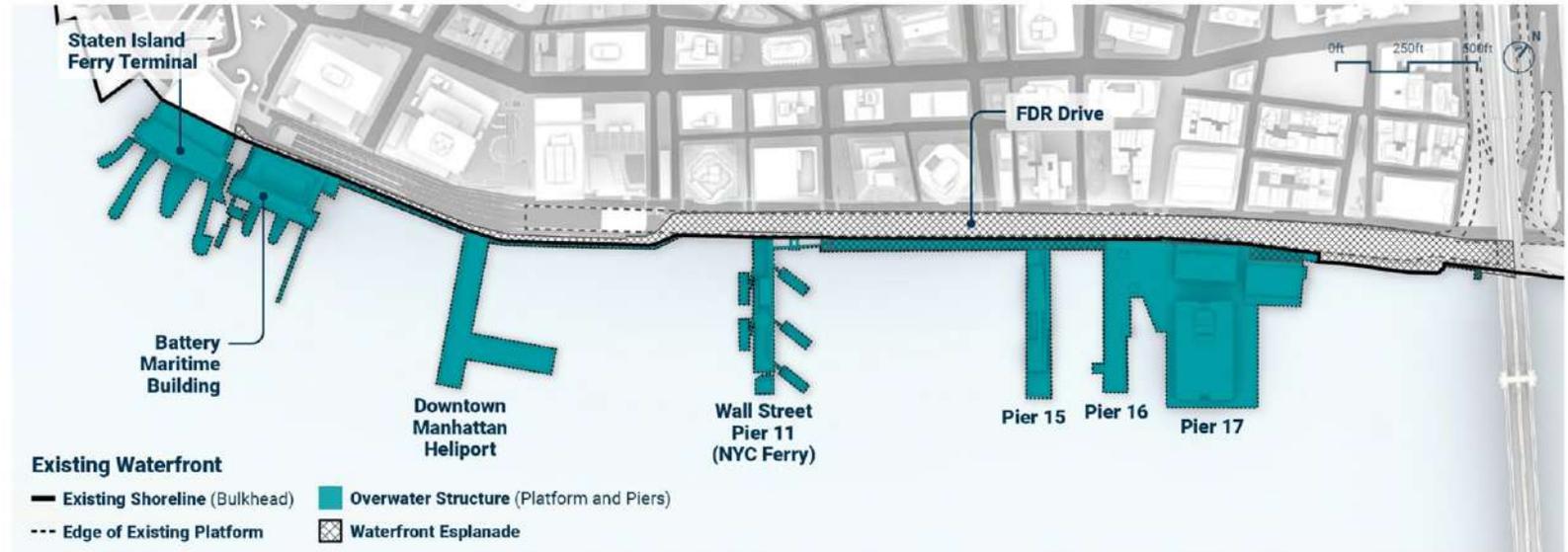


6. Eye-Level Views: Illustrate the experience of the proposed future conditions.

This table describes the various image types used in the master plan document.

The Waterfront Today

Lower Manhattan’s waterfront is unique. It houses maritime functions that serve residents, workers, and visitors throughout the entire region, includes historic landmarks, and links together sections of the Manhattan Waterfront Greenway. Adjacent to this waterfront is the Financial District, a hub of the city’s economy and a growing residential district, and the South Street Seaport, with dozens of small businesses and historical assets. Protecting this one-mile stretch between The Battery and the Brooklyn Bridge requires an understanding of what exists there today, as well as the services this waterfront provides – both to the adjacent neighborhoods and the city as a whole.



Seating with views of the East River (Photo Credit: SCAPE)



Bike path and esplanade under the Brooklyn Bridge (Photo Credit: SCAPE)



Ferry docks on Pier 11 (Photo Credit: SCAPE)

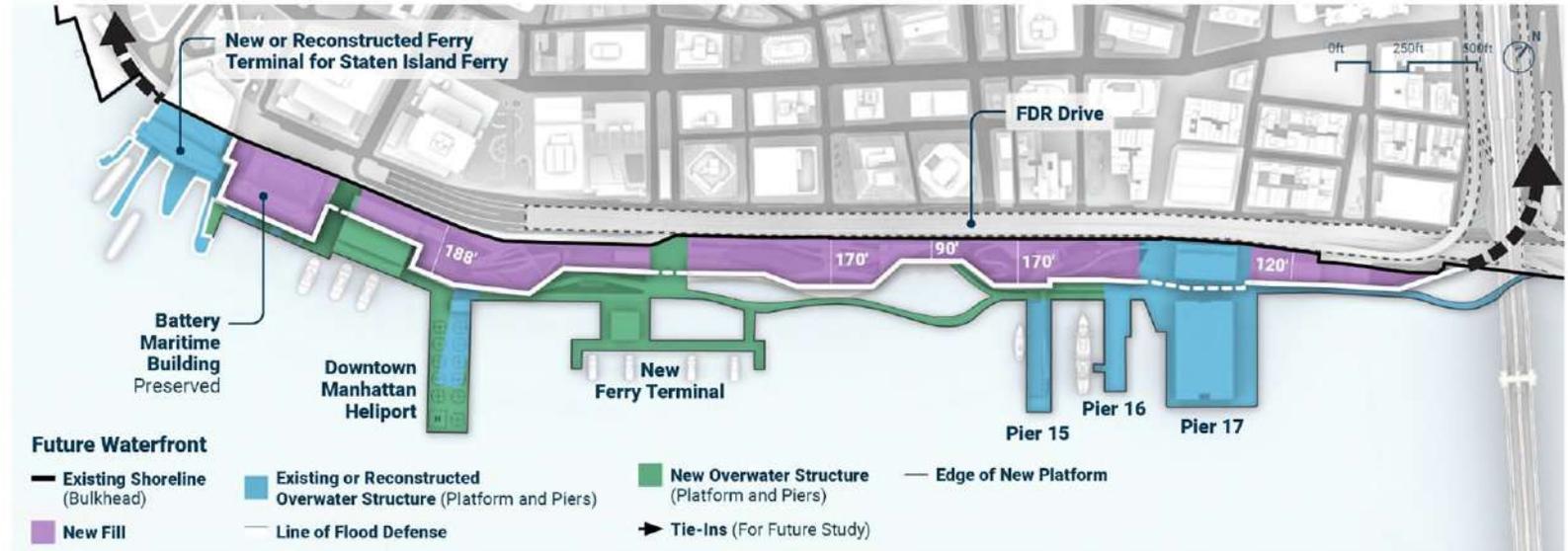
How will the Waterfront Change from Today?

What is changing?

- The shoreline will extend approximately 90 to 200 feet into the East River with a series of caissons (an airtight structure that holds water back) lining the shoreline. The new shoreline will be 15 to 18 feet taller than the existing waterfront. Behind the caissons, clean fill will create new land.
- Outboard of this new land, piers and other platform structures will be elevated. These areas will be designed to flood during coastal storms.
- Today's maritime facilities would need to be redesigned, and in some cases relocated. They would integrate flood defense and be protected from coastal storms and future tidal flooding. While the master plan accommodates the same level of maritime and heliport service as exists today (number of slips and heliport landing area), there is flexibility along the shoreline for future expansion of maritime uses.
- New types of open space that take advantage of the height of the flood defense would complement open space uses that exist today. These new multi-level waterfront open spaces would provide expansive views of the harbor and immersive opportunities for people to get close to the water. The proposed open space totals approximately 210% of today's open space.

What would remain the same?

- The waterfront would continue to provide access to key maritime uses and open spaces.
- The Historic South Street Seaport Piers would largely remain the same, as Pier 17 was rebuilt and elevated after Hurricane Sandy. Piers 15 and 16 would need to be reconstructed and elevated but are proposed to remain similar in character to what exists today.



View south from the top of Pier 17 of the Financial District and Seaport waterfront in December 2021 (Photo Credit: One Architecture & Urbanism)



Illustrative view south from the top of Pier 17 of what the waterfront could look and feel like after the master plan is complete

The Waterfront Today

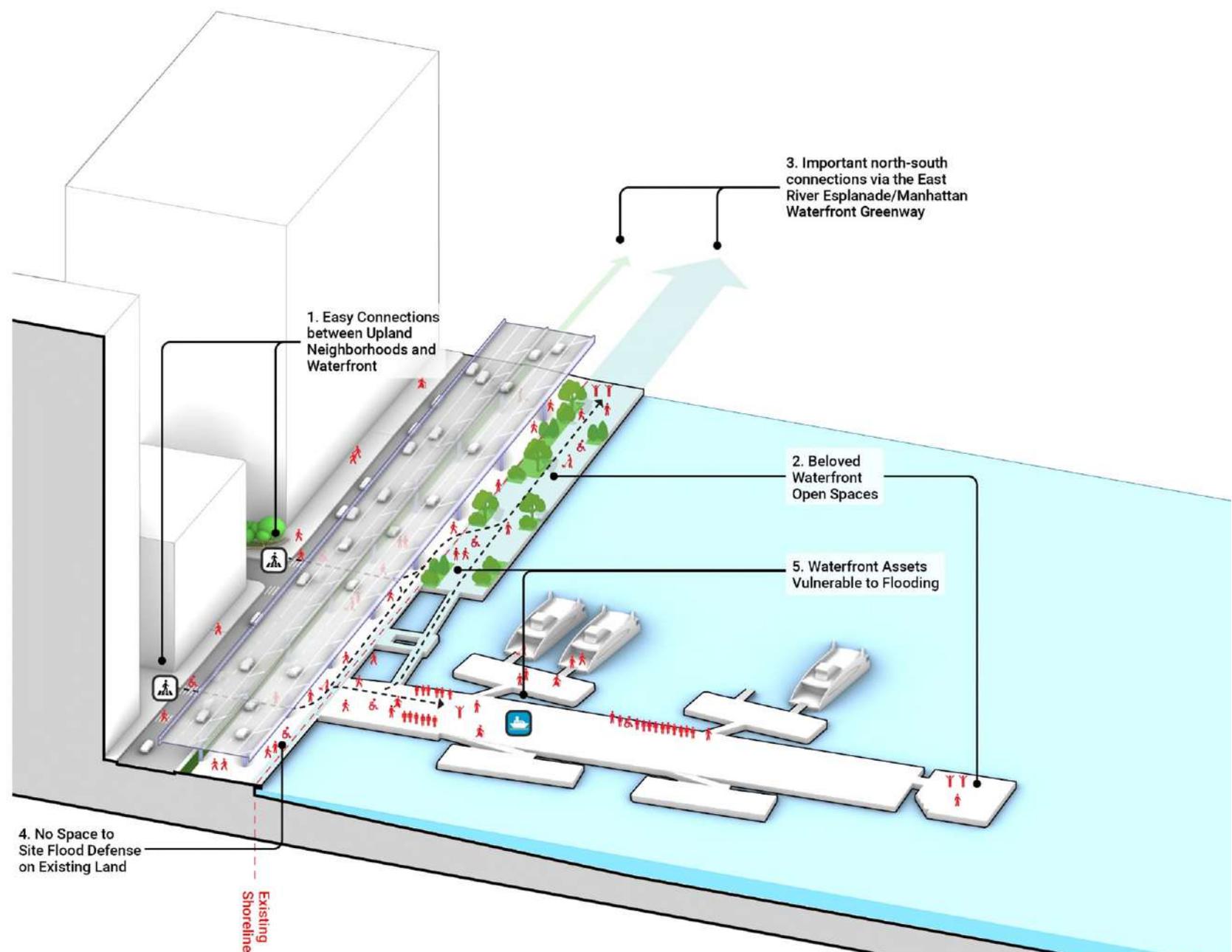
Today, the Financial District and Seaport waterfront is easily accessible. It connects people between the Brooklyn Bridge and The Battery, links key transportation facilities, and hosts open space and recreational amenities.

The Waterfront Today:

1. Is characterized by universally accessible circulation from the upland neighborhoods to open spaces, maritime facilities, and other waterfront destinations but suffers from poor pedestrian and cyclist connections in many areas.
2. Is home to approximately ten acres of open space, the majority of which is the East River Esplanade, which connects other small open spaces, plazas, and waterfront seating. The waterfront lacks any larger open spaces appropriate for gathering and recreation.
3. Provides community amenities such as food, beverage and entertainment establishments along the esplanade and on the piers.
4. Connects pedestrians and cyclists from the Battery to the waterfront to the north via the East River Esplanade and the Manhattan Greenway.

Challenges the Waterfront Faces Now and into the Future:

5. The waterfront has little to no space to site flood defense infrastructure. Much of the area on the water side of the FDR Drive Viaduct is built on pile-supported structures. The dense concentration of above- and below-ground infrastructure further limits on land options to site flood defense.
6. Existing maritime facilities and waterfront open spaces are low lying and thus vulnerable to flooding from coastal storms and sea level rise.



*Diagram is representative of the waterfront between Old Slip and John Street.

21st Century Resilient Waterfront Concept

Designing a resilient 21st-century waterfront for the Financial District and Seaport requires carefully balancing each of the master plan goals. Most notably, the master plan needs to ensure that the flood defense infrastructure does not disconnect people and emergency vehicles from the waterfront and critical maritime uses, while also avoiding and minimizing impacts to aquatic habitats in the East River and minimizing the in-water footprint of any new waterfront infrastructure.

Design Concept Drivers:

The Shoreline Extends to Create Inviting Entrances That Connect the Neighborhoods to the Waterfront.

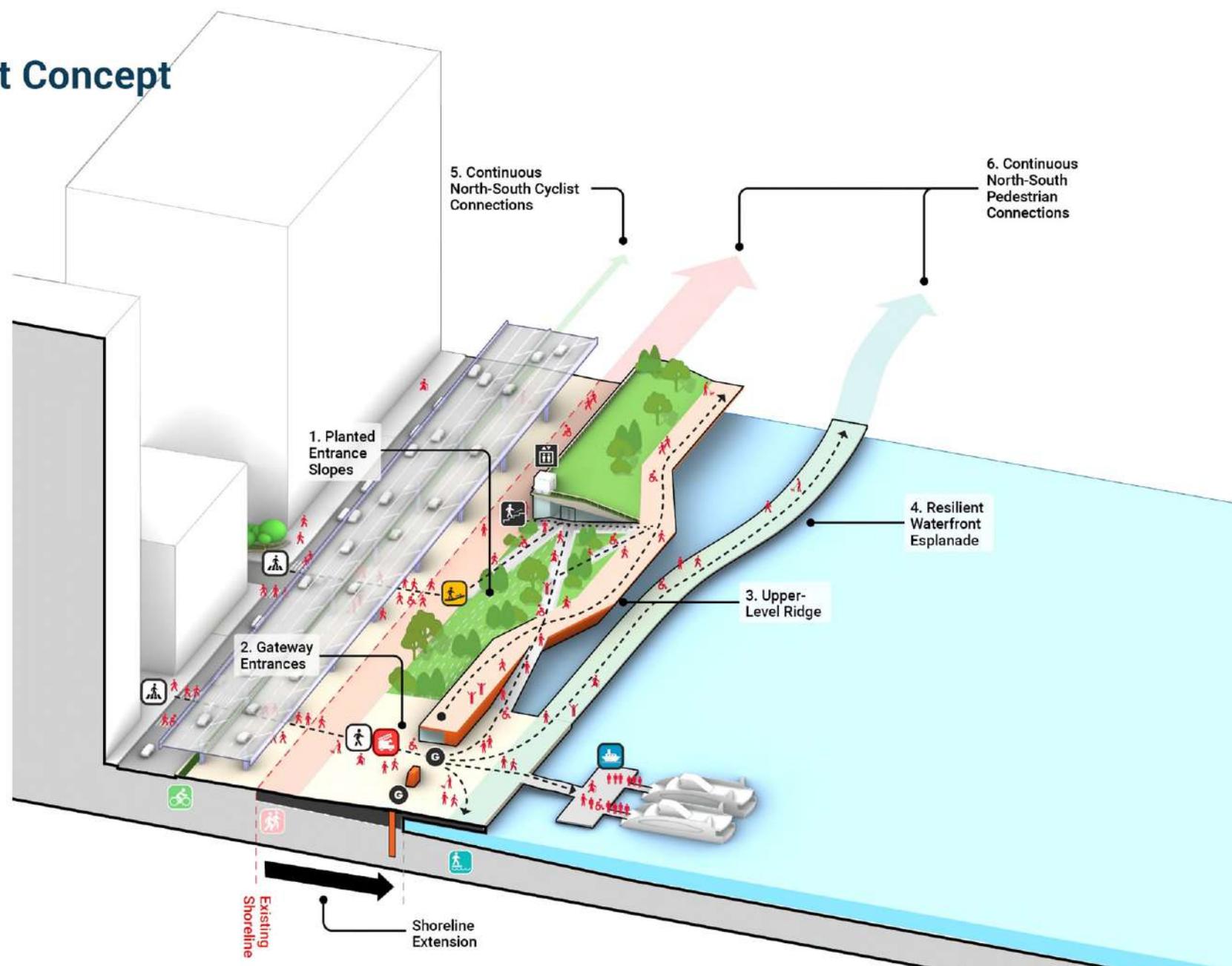
1. Planted entrance slopes bring people up to the upper level ridge via gently sloping paths that integrate seating, lawns, and kiosks.
2. Gateways frame views to the East River and people and vehicles directly from the neighborhoods to the waterfront.

Flood Defense Infrastructure Creates Dynamic Multi-Level Waterfront Open Spaces That Protect the Neighborhoods.

3. Atop the upper-level ridge, open spaces complement expansive 360 degree views of the East River, New York Harbor, and the city.
4. The lower-level resilient waterfront esplanade weaves closer and further from the shoreline, giving people an immersive waterfront experience and connecting people to key maritime facilities.

Strengthened and Enhanced Continuous Upland and Waterfront North-South Connections.

5. The Manhattan Waterfront Greenway gives cyclists continuous north-south connectivity along South Street.
6. Pedestrians have continuous north-south connectivity along the waterfront Esplanade and along South Street and under the FDR Viaduct.



*Diagram is representative of the waterfront between Old Slip and John Street.

21st Century Resilient Waterfront Concept

The master plan proposes a collection of diverse and captivating experiences unlike anywhere else along the City's waterfront. By providing a variety of urban and waterfront experiences, this conceptual design is welcoming to nearby residents, commuters, and visitors alike. The master plan presents a design framework with which the City will continue to collaborate with the community to design open space that best meets neighborhood and citywide needs.

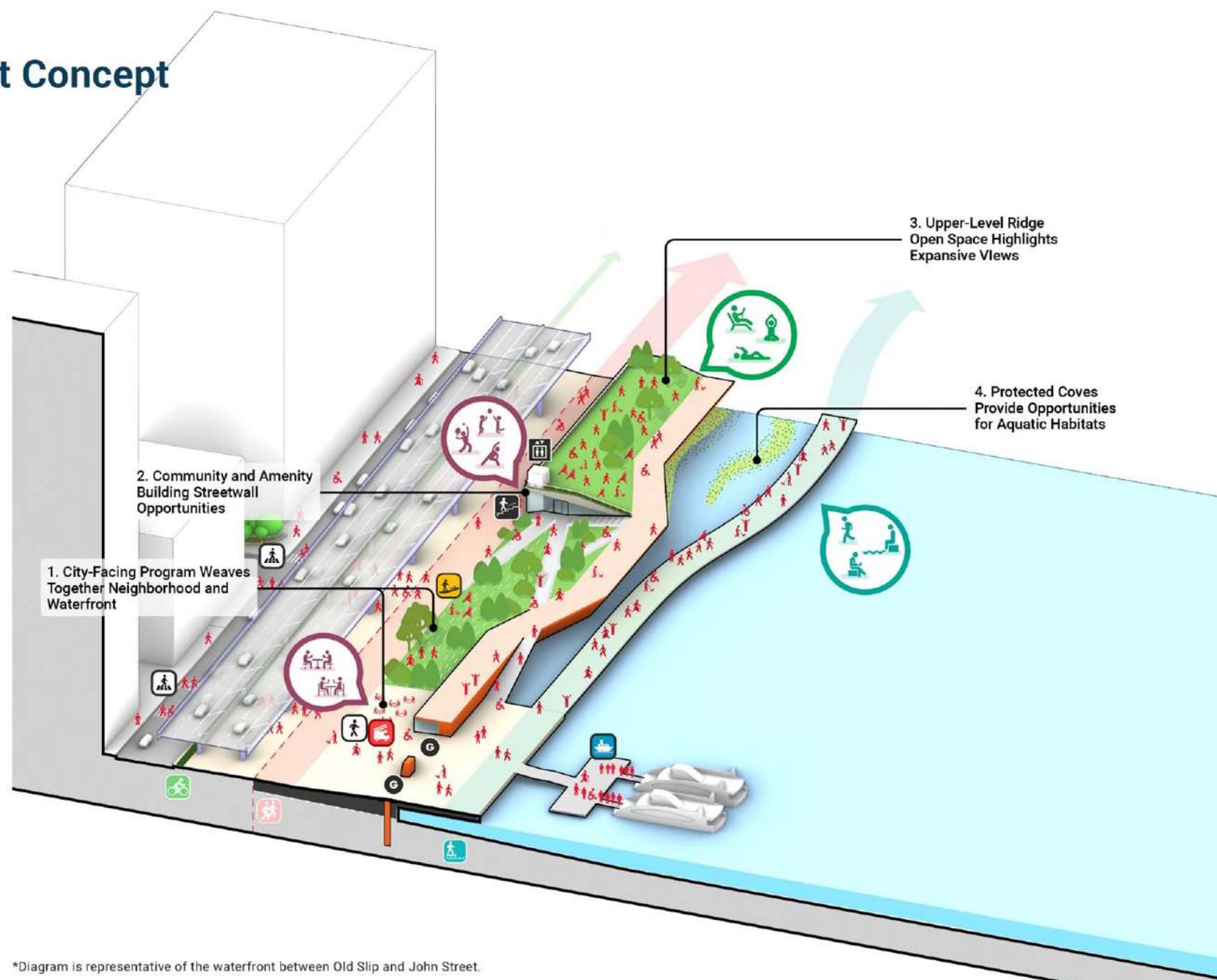
Design Concept Opportunities:

City-Facing Spaces

1. City-facing open spaces can be programmed to complement and augment existing upland open spaces and weave together the neighborhoods and new waterfront.
2. Community serving buildings and amenity spaces adjacent infrastructure buildings can create an active South Street streetwall.

Multi-Level Waterfront

3. The upper-level ridge can be programmed to take advantage of expansive views and can integrate indoor and outdoor amenities.
4. Where the shoreline pulls in toward the existing edge, protected coves make space for aquatic habitat and the esplanade can incorporate get-downs bring people closer to the water and enable educational programming.



*Diagram is representative of the waterfront between Old Slip and John Street.

Proposed Waterfront - Sunny Day

COVES

New coves, with wave screening and habitat enhancements, support the health of the river's aquatic ecosystems and provide educational opportunities for New Yorkers to learn about harbor ecosystems.

GATEWAYS

During normal weather conditions, gateways provide openings in the ridges for people to walk directly to the esplanade, providing views of the river from the city. Floodgates will be closed ahead of a coastal storm.

ESPLANADE

A raised esplanade protects against tidal flooding and provides access along the entire waterfront for people to connect to the water's edge and the ferries, boats, and piers located here.

RIDGES

Floodwalls buried under the landscape create a line of ridges along this waterfront, permanently protecting Lower Manhattan from coastal storm flooding and creating new open spaces with expansive views of the harbor.

SLOPES

Universally accessible pathways sloping up and down the ridges create connections between the city and the water's edge.

Proposed Waterfront - Storm Event

BOATS

Ferries, boats, and ships are safely moved outside the area.

FLOODGATES

Ahead of a coastal storm, floodgates that are stored out of view along the shoreline are closed, completing a continuous line of flood defense.

PUBLIC-SERVING USES

Behind the flood defense infrastructure, open space, playgrounds, and community-serving buildings are protected.

ESPLANADE

To provide protection from future tides while remaining at the water's edge, the esplanade is designed using materials and plantings that can withstand flooding.

Design Drivers, Design Opportunities, & What Needs Further Technical Study

The Master Plan

A floodwall, 15 to 18 feet higher than the waterfront today, provides protection from coastal storms

A new pump station manages stormwater to prevent flooding behind the line of flood defense

Limited floodgates are stored along the shoreline during normal weather conditions and closed during coastal storms

Community-serving uses – from lawns to playgrounds to indoor spaces – are integrated throughout

The master plan is compatible with the FDR Drive viaduct as it is today or a future replacement, such as a surface-level boulevard

Resilient ferry terminals and maritime facilities are reconstructed along the shoreline

Shoreline is raised three to five feet higher than today in response to future tidal flooding

The shoreline is extended into the East River approximately 90 to 200 feet to make space for flood defense infrastructure

A public esplanade provides continuous connections along the shoreline

Opportunities to enhance habitats for fish and other aquatic organisms line the shore

Design Drivers & Flexibility in the Master Plan

Key Design Drivers or “What’s Fixed”

Elements and systems of the master plan that underpin the design and assumptions that drive the “bones” of the project. Changing these elements changes the project radically.

What is more “fixed” in the master plan?

- The flood defense infrastructure would protect against the dual threats of future frequent tidal flooding and future coastal storms.
- The general flood defense alignment and space needed for universal access to the waterfront (space varies depending on access type up-and-over pathway vs gates).
- The flood defense would tie into higher ground near Bowling Green in the south and would connect to the adjacent BMCR project to the north.
- Primary access points are aligned with key upland street corridors to enable direct access to the waterfront for pedestrians and emergency vehicles via gateway entrances and for pedestrians via up-and-over pathways to provide universal access to the waterfront.
- A pump station would be located south of Old Slip.
- Ferry terminals and maritime facilities would be reconstructed to be resilient and would be concentrated south of Pier 15.
- Continuous north-south pedestrian sidewalks, Manhattan Greenway (bike path), and waterfront esplanade.
- Minimizing in-water footprint and impacts to East River aquatic habitats
- Development cannot be the justification for shoreline extension.

Design Opportunities or “What’s Flexible”

Elements of the master plan that, if altered, would not radically change the current master plan. As the design advances, community and stakeholder feedback, future projected needs, and New York City policy would shape these elements.

What is more “flexible” in the master plan?

- Specific design of open spaces along the new elevated waterfront.
- Specific design of the bike path and waterfront esplanade.
- Opportunities to connect with and get closer to the water.
- Open space program and design that is a combination of passive and active recreation spaces that reflect community needs and desires.
- Location, design, and programming of buildings.
- Maritime facilities would be designed to be flexible in order to expand to accommodate future growth.
- The master plan works with the FDR Drive Viaduct as it exists today and if it were to be replaced with an at-grade boulevard.
- Incorporation of green infrastructure and other nature-based solutions to manage stormwater.
- Opportunities to support and enhance local aquatic and terrestrial habitats and ecosystems.
- Integration of carbon-neutral materials and construction and nature-based solutions.

What Requires Further Technical Study

Elements of the master plan that need further detailed study before further design.

What requires more technical study?

- Southern and northern tie-in alignments and how they could integrate with their neighborhood contexts.
- Flood defense alignment at the US Coast Guard site and potential location for a pump station.
- Flood defense alignment and design of a reconstructed Whitehall Ferry Terminal.
- Flood defense alignment and structure at the Battery Maritime Building that protects the historic structure while spanning a complex network of subsurface infrastructure.
- Feasibility study to determine recommended pump station location.
- Further study to determine the pump station sizing, operation, and use.
- A maritime study, acknowledging both vulnerability of assets to climate change and growth in ridership.
- Identification of a governance entity to see the master plan from design and approvals through to construction and long-term operations and maintenance.
- Further study to identify the funding to make this master plan a reality.

How Do We Map What Is Fixed And Flexible?

Numbers refer to location specific notes that reference numbered call outs on the diagram.

Key Design Drivers or "What's Fixed"

1. Location specific notes
- General notes

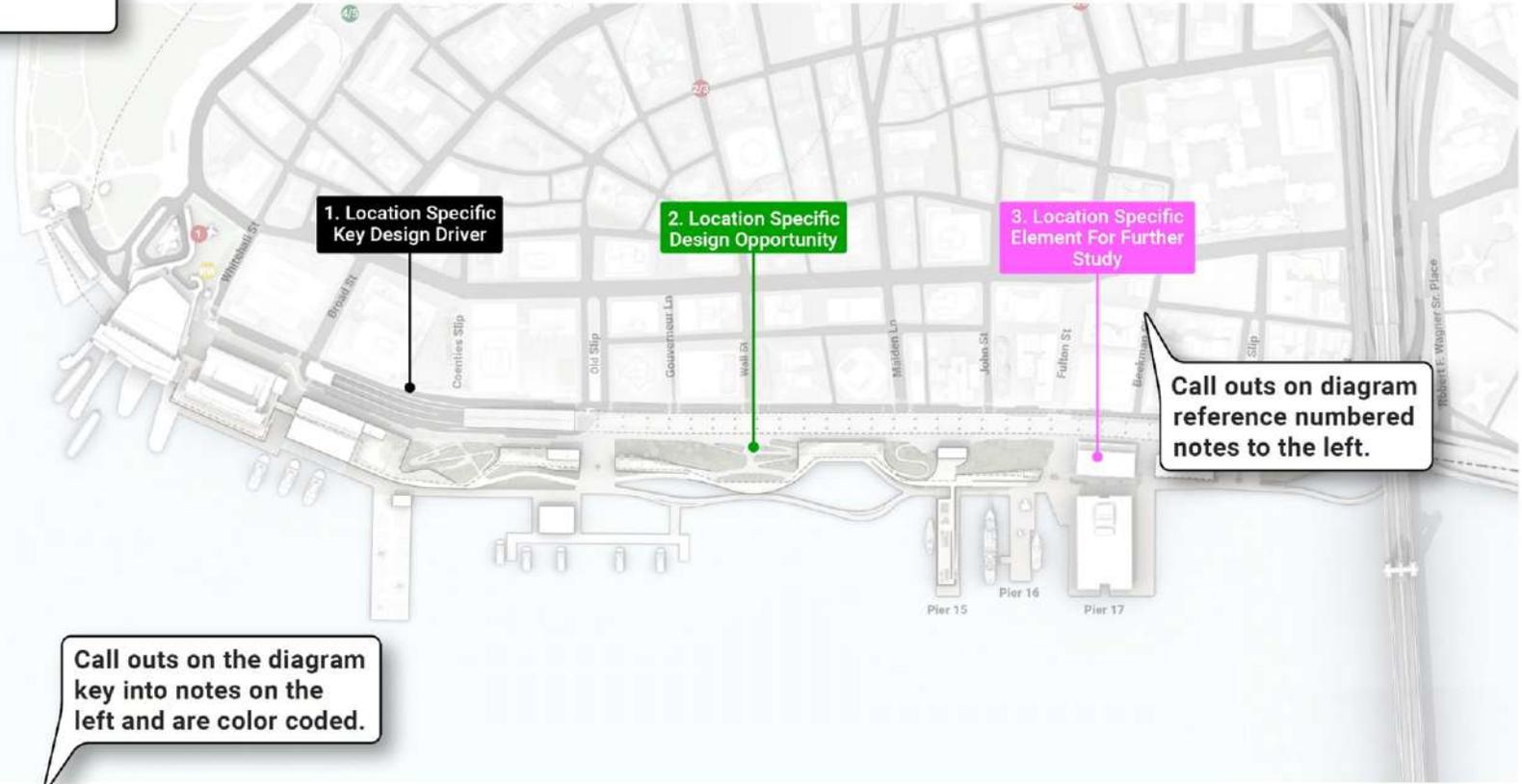
Design Opportunities or "What's Flexible"

2. Location specific notes
- General notes

What Requires Further Technical Study

3. Location specific notes
- General notes

Bullets refer to general notes.

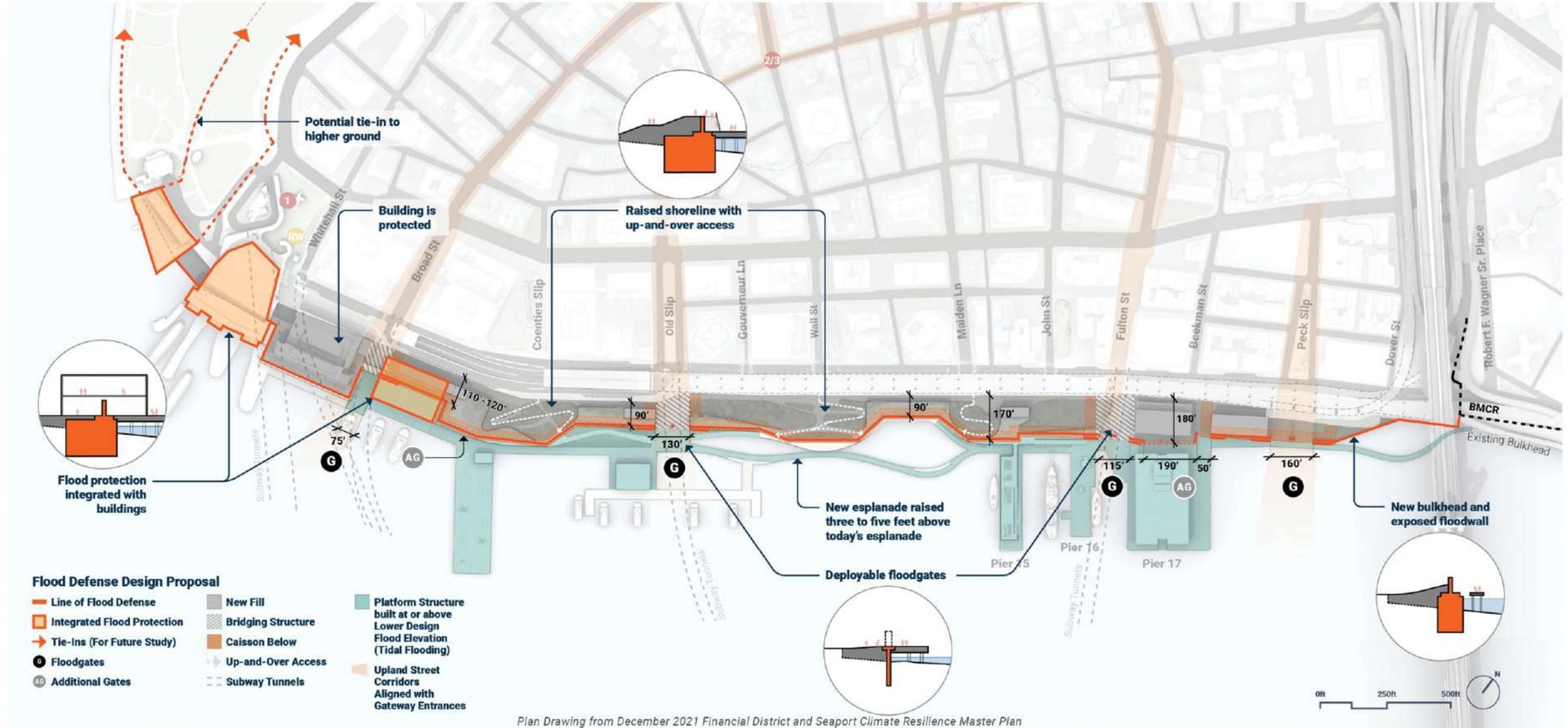


Call outs on the diagram key into notes on the left and are color coded.

- Key Design Drivers (Fixed)
- Design Opportunities (Flexible)
- Further Study

Flood Defense

Layout of Flood Defense Infrastructure Types, Key Gate Locations, and Fill and Platform Extents



Flood Defense

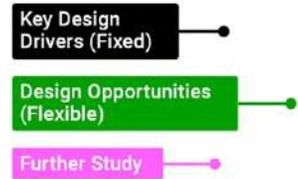
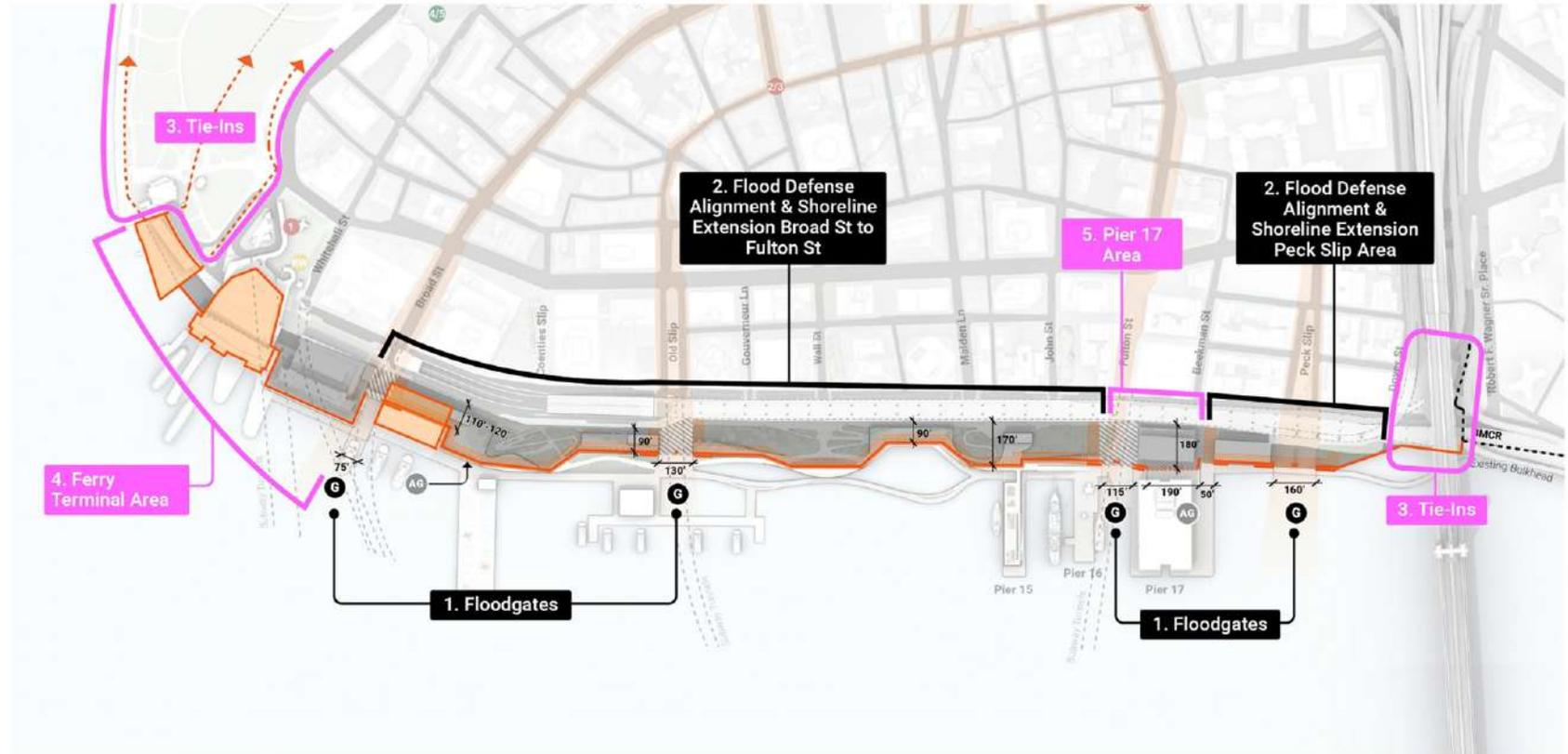
Design Drivers & Design Opportunities

Key Design Drivers or “What’s Fixed”

1. Site gate locations that serve as primary direct access points to the waterfront. Flood gates are aligned with key street corridors to provide direct emergency vehicular access and visual connections to the waterfront.
2. General flood defense alignment and shoreline extension from Broad Street to Peck Slip. The in-water footprint of the flood defense infrastructure would be minimized.

What Requires Further Technical Study

3. The pathway the flood defense alignment could take to tie into higher ground or connect to existing and planned projects at the southern and northern ends and how these tie-ins can integrate with their neighborhood contexts.
4. Flood defense alignment as it navigates major maritime assets and subsurface infrastructure from the Battery to Broad Street.
5. Gate configuration and type at Pier 17 so that flood defense is integrated with existing circulation and emergency and operations access. The gate strategy, including gate widths and types, needs to be further refined.



Southern Tie-In

Design Drivers & Design Opportunities

Key Design Drivers or “What’s Fixed”

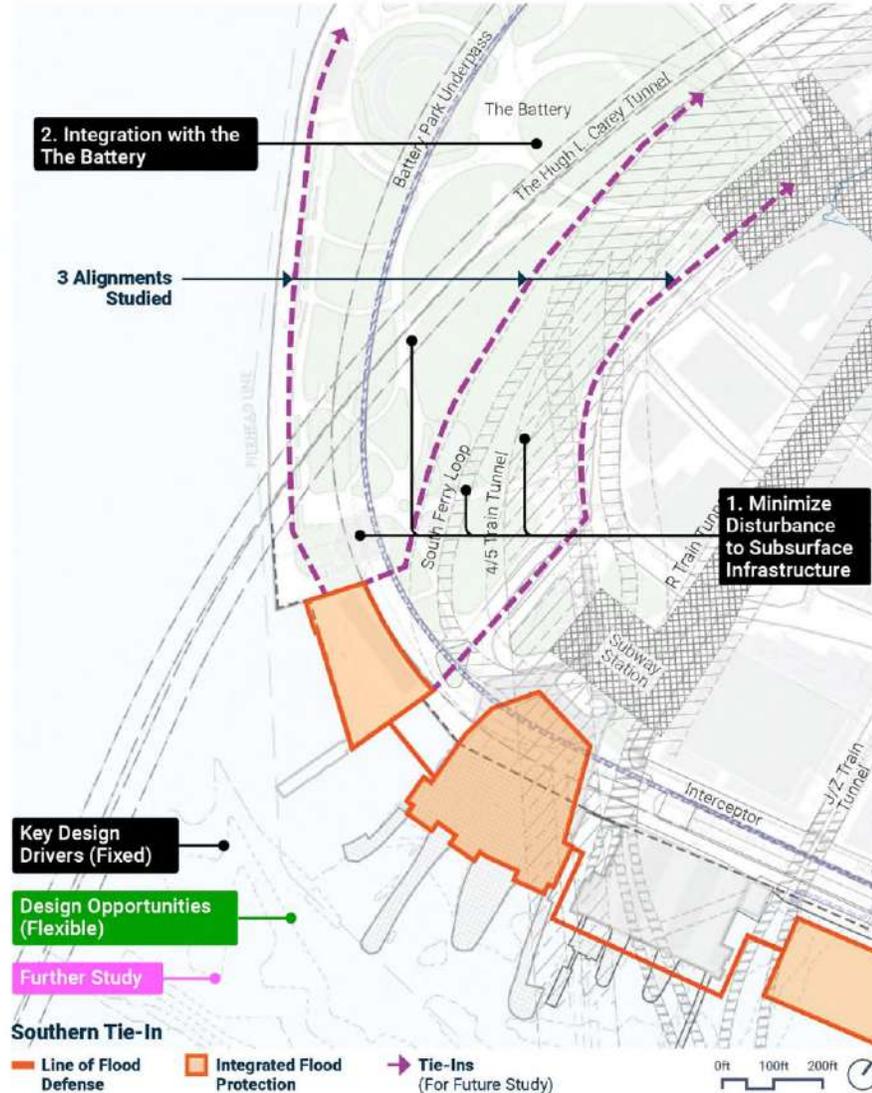
1. Minimizing disturbance to critical subsurface infrastructure such as utilities and subway infrastructure.
2. The southern tie-in will need to interface with The Battery in order to reach high ground near Bowling Green.

Design Opportunities or “What’s Flexible”

- The exact pathway from the waterfront to the high point tie-in at Bowling Green.
- The specific spatial design and how the flood defense is physically integrated into the urban landscape.

What Requires Further Technical Study

- How the flood defense infrastructure could navigate specific underground assets once the pathway to high ground is determined.
- Which flood protection strategies might be suitable, including low berms, knee walls, and street raising (see examples to the right).
- The design for integrating the flood defense into the existing urban fabric, including The Battery and Bowling Green.
- Additional coordination with NYC Parks, the community, and other critical stakeholders.



Plan Drawing from December 2021 Financial District and Seaport Climate Resilience Master Plan



Integration Strategy - Low Berm: Low berms with small elevation change can be integrated easily with existing green spaces.
Example: Long Dock Park, Beacon, NY (Image Credit: One Architecture & Urbanism)



Integration Strategy - Knee Wall: These short walls can be integrated into an existing landscape with minimal disruption and serve as seating in addition to flood protection.
Example: Hunters Point South, Queens, NY (Image Credit: NYCEDC)



Integration Strategy - Street Raising: Raising existing roads can provide access and egress during storm events while also acting as a line of defense for upland areas.
Example: Broad Channel Street Raising Phase 2, New York, NY (Image Credit: Arcadis)

Northern Tie-In

Design Drivers & Design Opportunities

Key Design Drivers or "What's Fixed"

1. The flood defense system needs to tie into higher ground near the Brooklyn Bridge.

What Requires Further Technical Study

- Review of North-South circulation and connectivity along the esplanade through the tie-in point.
- Refinement or redesign of the area for compatibility and phasing with other projects, such as the Seaport Coastal Resiliency Project and the Brooklyn Bridge Esplanade "get down".
- How the flood defense system would interface with the Brooklyn Bridge-Montgomery Coastal Resiliency (BMCR) flood defense.

Key Design Drivers (Fixed)

Design Opportunities (Flexible)

Further Study



Plan Drawing from December 2021 Financial District and Seaport Climate Resiliency Master Plan



Photo along the East River Esplanade looking south. Photo Credit: One Architecture & Urbanism



Photo of the existing shoreline and FDR Viaduct ramps looking north. Photo Credit: One Architecture & Urbanism



Photo along Dover Street south of the Brooklyn Bridge. Photo Credit: One Architecture & Urbanism

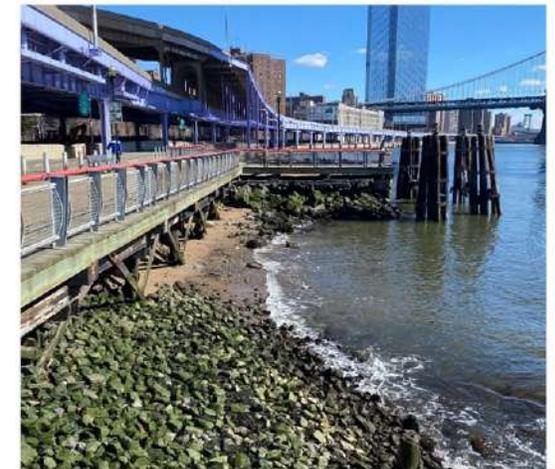


Photo of the East River Esplanade north of Dover Street. Photo Credit: One Architecture & Urbanism

Stormwater Management

Potential Stormwater Management Strategies and Locations Including Pump Station and Green Infrastructure



Stormwater Management

Design Drivers & Design Opportunities

Key Design Drivers or “What’s Fixed”

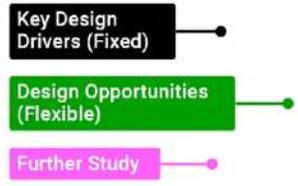
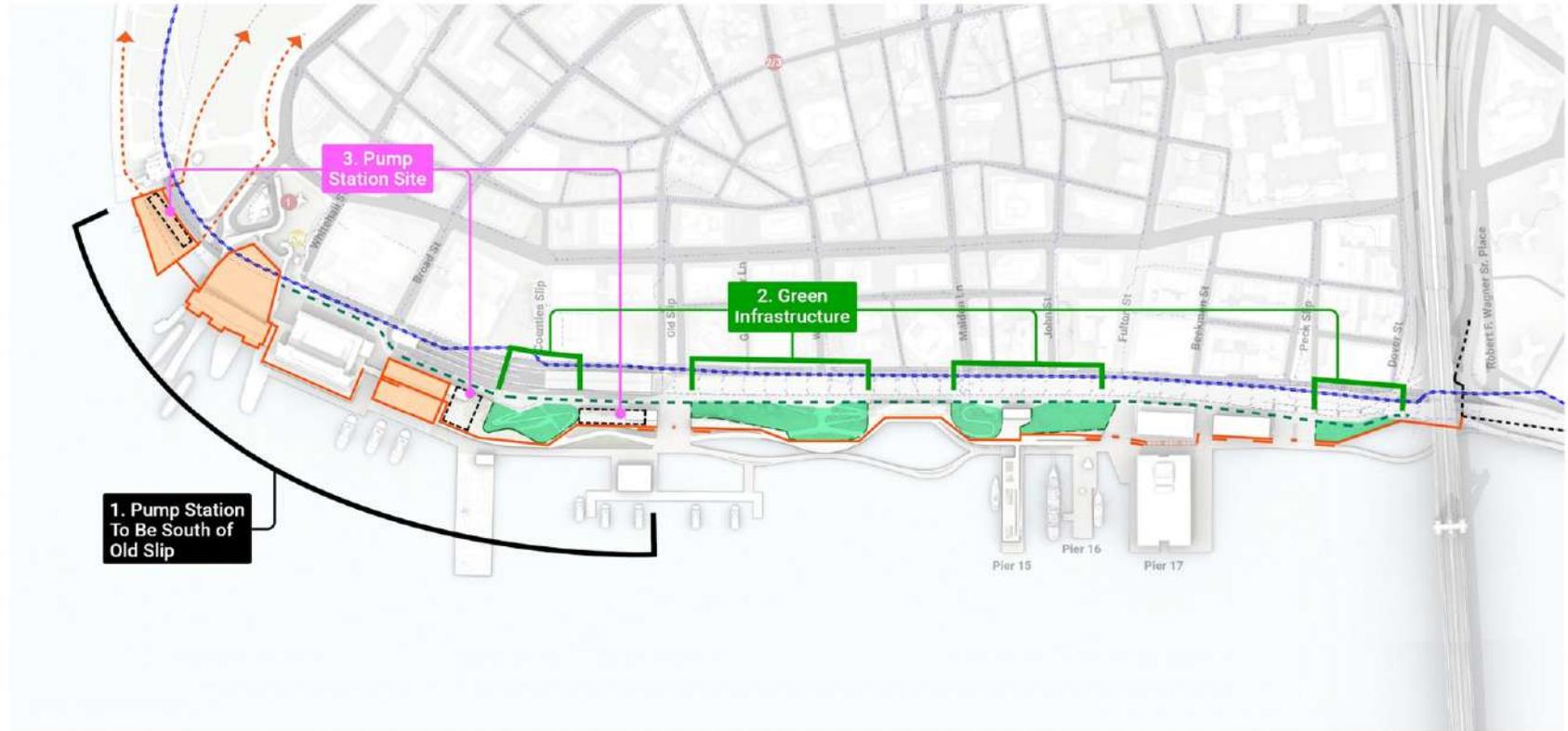
1. A pump station, which is needed to manage the large volume of stormwater in the drainage study area, would be located south of Old Slip. The Financial District and Seaport drainage study area is defined as the sewer system drainage area bordered by the assumed alignment of the flood defense systems.

Design Opportunities or “What’s Flexible”

2. How green infrastructure can be integrated with open space to help manage water before it enters the sewer system in non coastal storm conditions.
- Co-locating additional program with pump station, depending on the site determined.

What Requires Further Technical Study

3. Further study on the pump station including a feasibility study to determine recommended pump station location and further study to determine the pump station sizing, operation, and use.
- Green infrastructure performance and siting analysis.



Access and Circulation

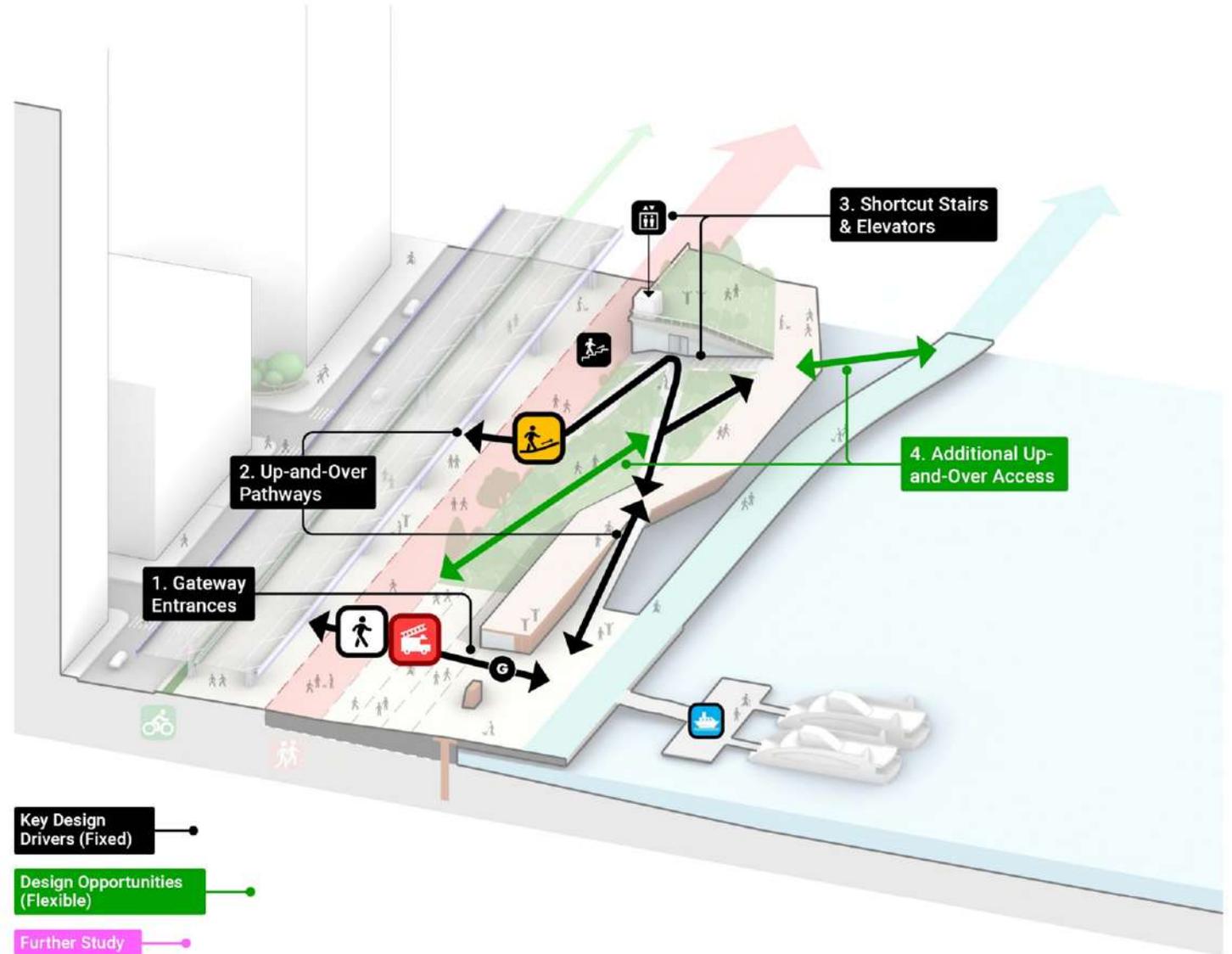
Considerations Driving Access Concept and Opportunities for Community Input

Key Design Drivers or "What's Fixed"

1. Gateway entrances would provide direct waterfront access for pedestrian and emergency, operations, and maintenance vehicles on gently sloped paths.
2. Up-and-over pathways would be located at key street corridors with gently sloped switchback paths to provide access for pedestrians & small operations vehicles.
3. Secondary access via shortcut stairs built into access points and elevators and escalators integrated with buildings.

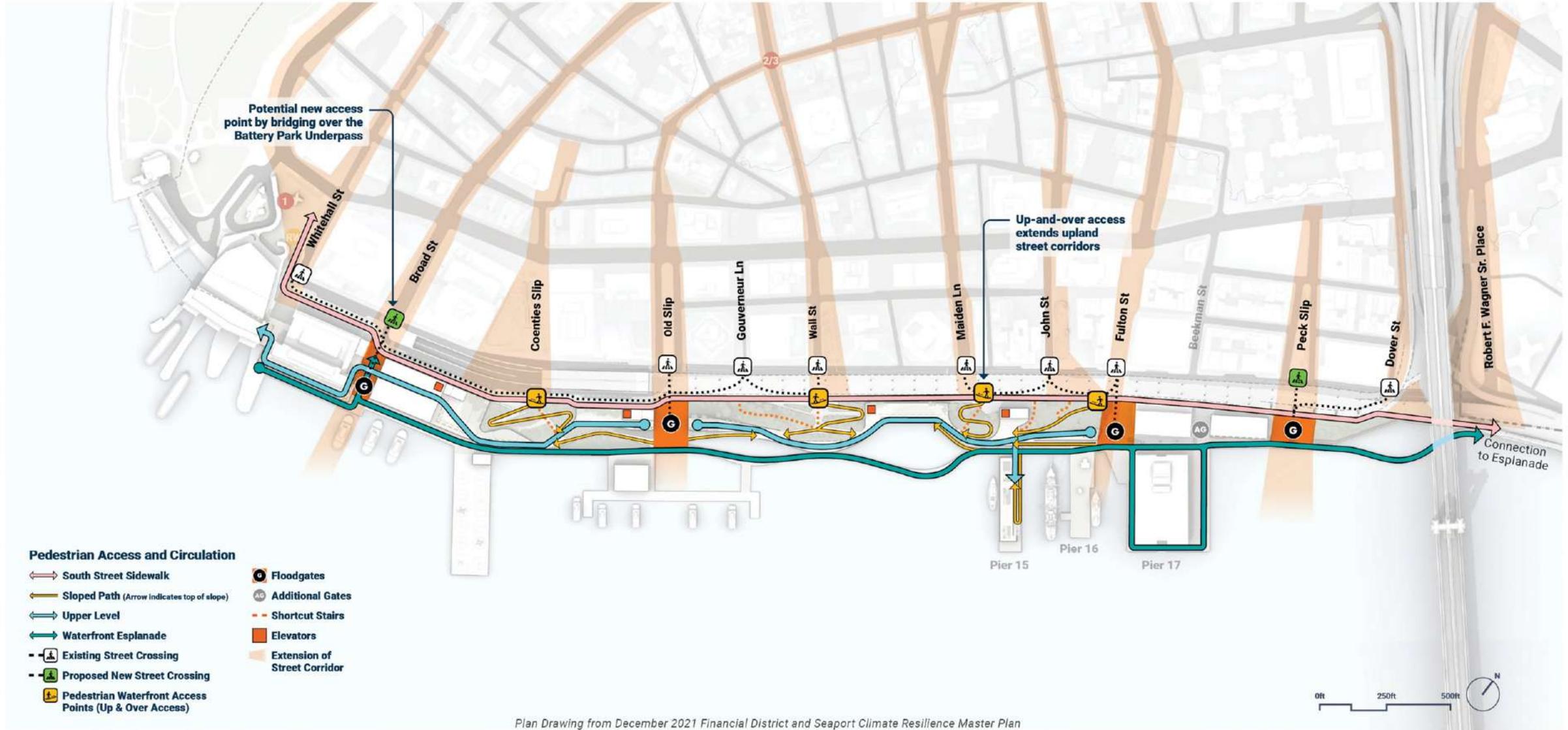
Design Opportunities or "What's Flexible"

4. The location of additional connections between the upper level & waterfront esplanade.
 - The exact location and layout of pathways, stairs, and elevators.



Access and Circulation

Pedestrian Access and Circulation Plan



Access and Circulation

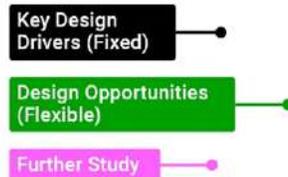
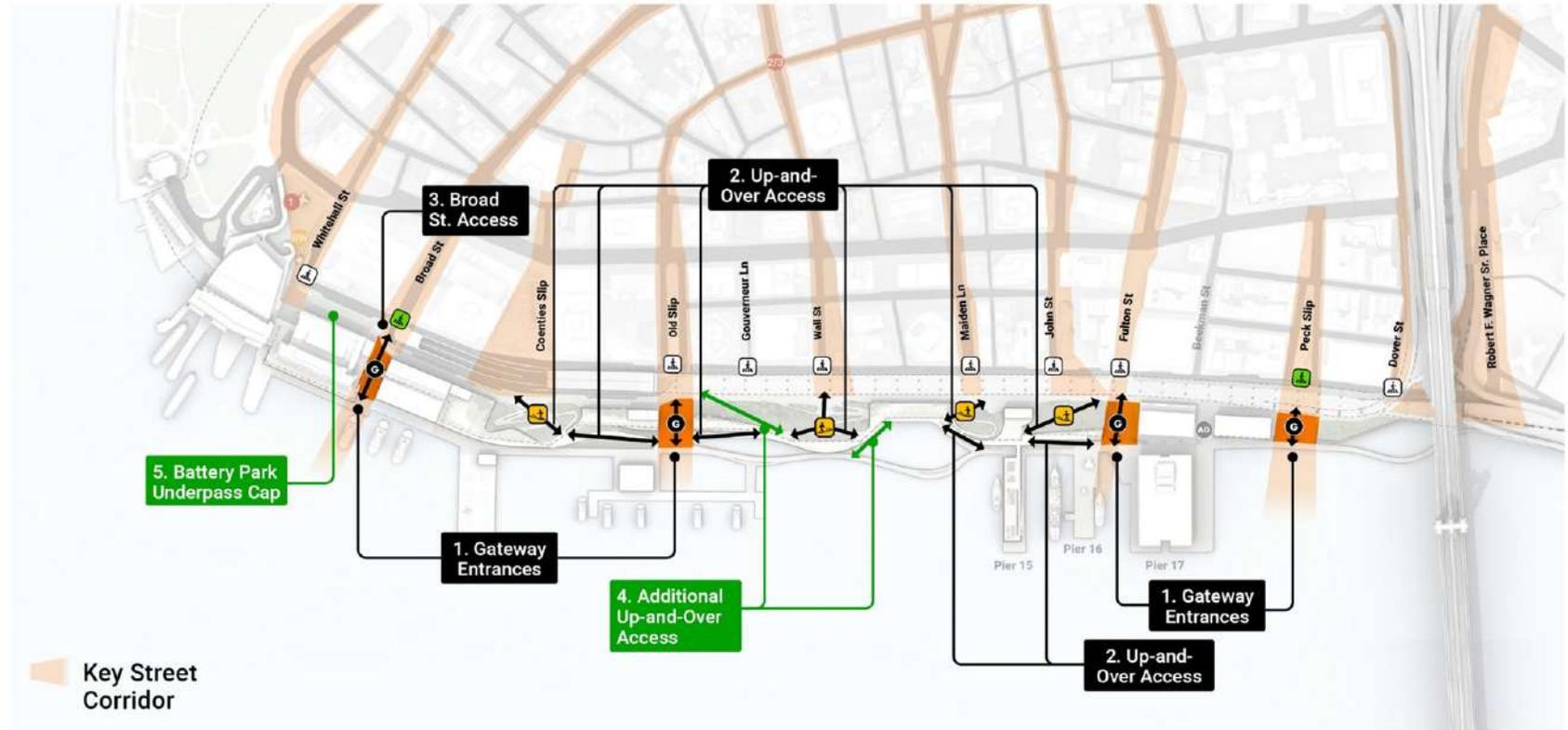
Pedestrian Access and Circulation Design Drivers & Design Opportunities

Key Design Drivers or “What’s Fixed”

1. Gateway entrances are aligned with key street corridors to provide direct emergency vehicular access and visual connections to the waterfront (at Broad Street, Old Slip, Fulton Street, Beekman Street, & Peck Slip).
2. Up-and-over pathway locations are aligned with key street corridors to provide universal accessibility and easy navigation to the waterfront (at Coenties Slip (Vietnam Veterans Memorial Plaza), Wall Street, Maiden Lane, & Fulton/John Street).
3. A new access point at Broad Street to provide direct pedestrian and vehicle connection to a proposed maritime facility north of the Battery Maritime Building.

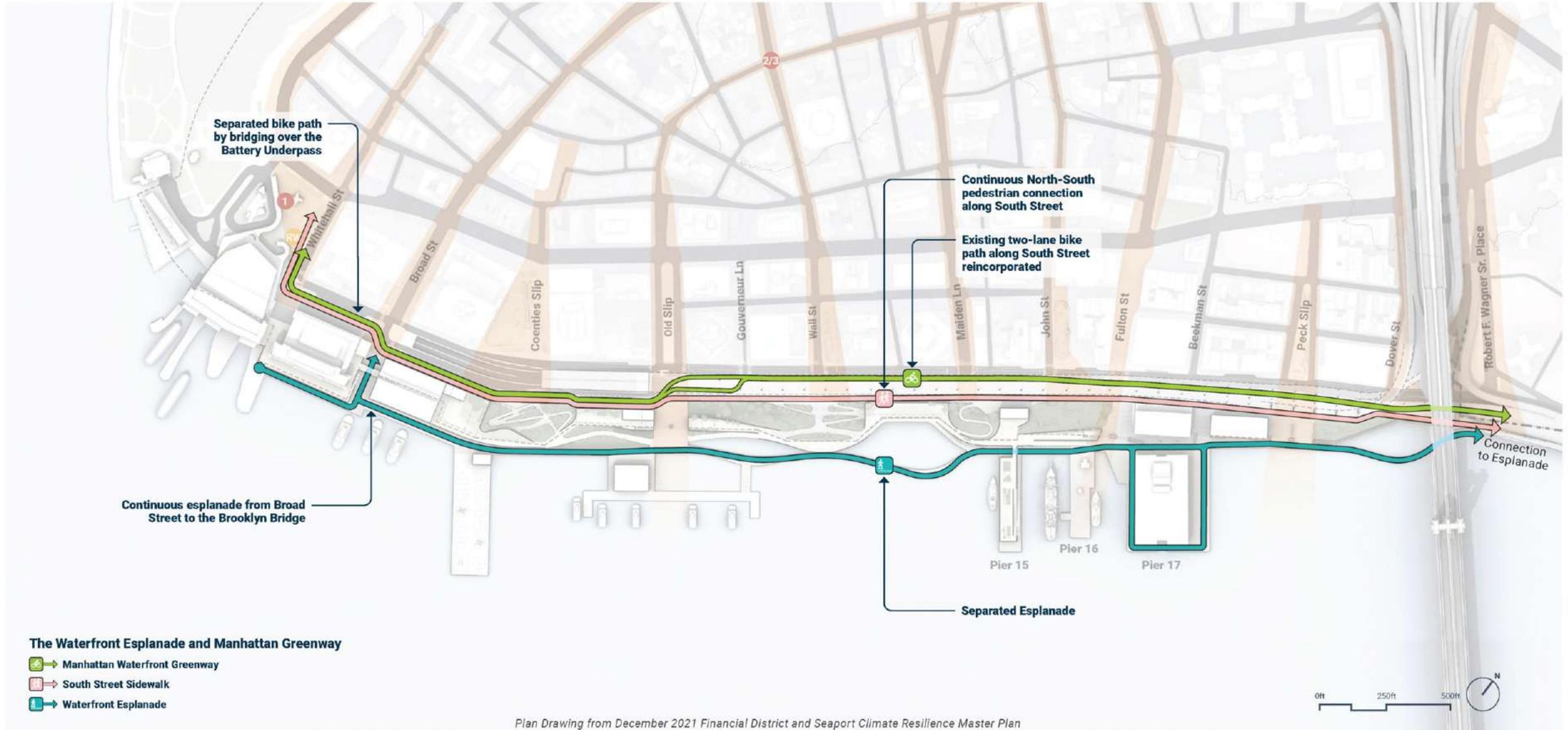
Design Opportunities or “What’s Flexible”

4. The location of additional connections between the upper level & waterfront esplanade.
 5. Providing access at Broad Street may be achieved by lowering the FDR in this area. This could provide an opportunity to deck over the highway in front of the Battery Maritime Building. This could deconflict a very constrained area and make pedestrian and vehicular circulation safer.
- Addition of at-grade street crossing at Coenties Slip (Vietnam Veterans Memorial Plaza) if the FDR is converted to an at-grade roadway.



Access and Circulation

North-South Pedestrian and Bicycle Connections Plan



Access and Circulation

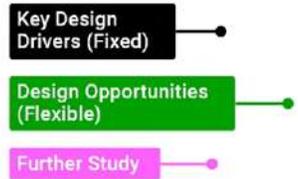
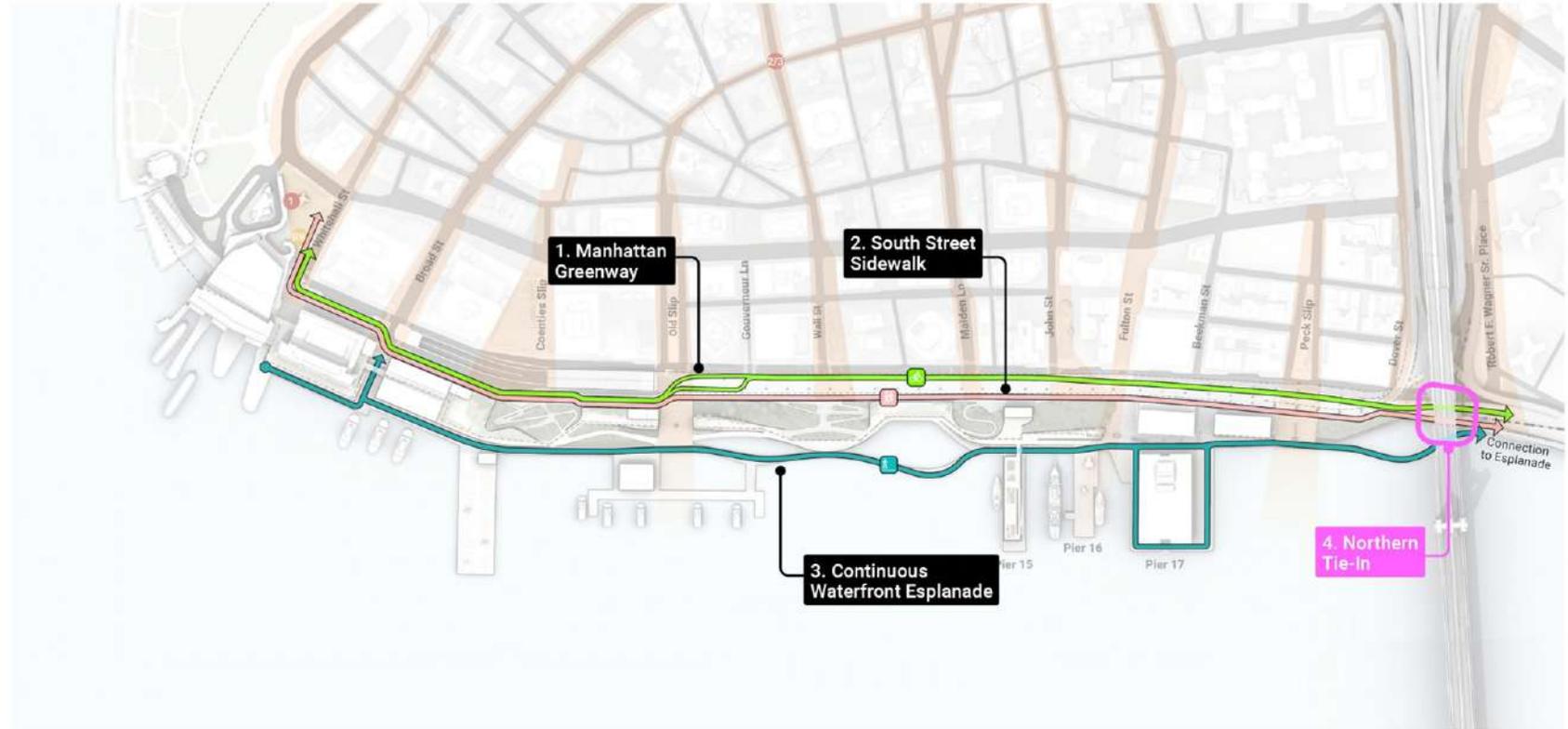
North-South Pedestrian and Bicycle Connections Design Drivers & Design Opportunities

Key Design Drivers or “What’s Fixed”

1. Manhattan Waterfront Greenway (2-lane bike path) continuous from Whitehall Street and the Battery Bikeway to the Brooklyn Bridge to maintain cyclist connectivity along the waterfront and throughout the project area.
2. Pedestrian sidewalk continuous from Whitehall Street to the Brooklyn Bridge to maintain pedestrian access along South Street and to connect to the Battery and waterfront north of the Brooklyn Bridge.
3. Continuous waterfront esplanade from Broad Street to the Brooklyn Bridge to maintain people’s connection to the water. Fire trucks and other emergency vehicles would be able to access the entire length of the esplanade.

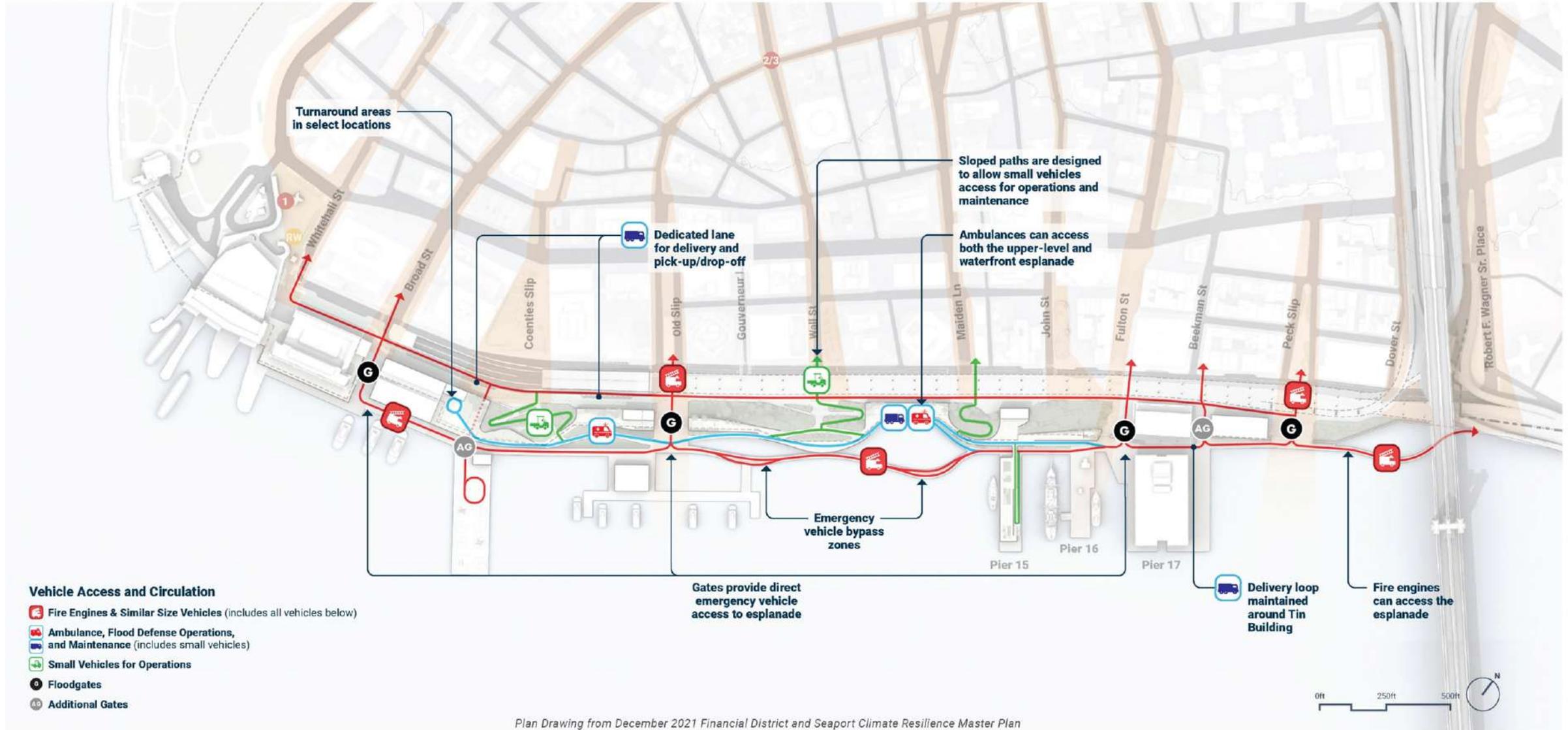
What Requires Further Technical Study

4. The specific flood defense alignment of the northern tie in, specifically in relation to waterfront circulation and how it interfaces with the adjacent Brooklyn Bridge-Montgomery Coastal Resilience project.



Access and Circulation

Emergency and Operations Vehicle Access and Circulation Plan



Access and Circulation

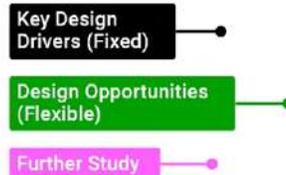
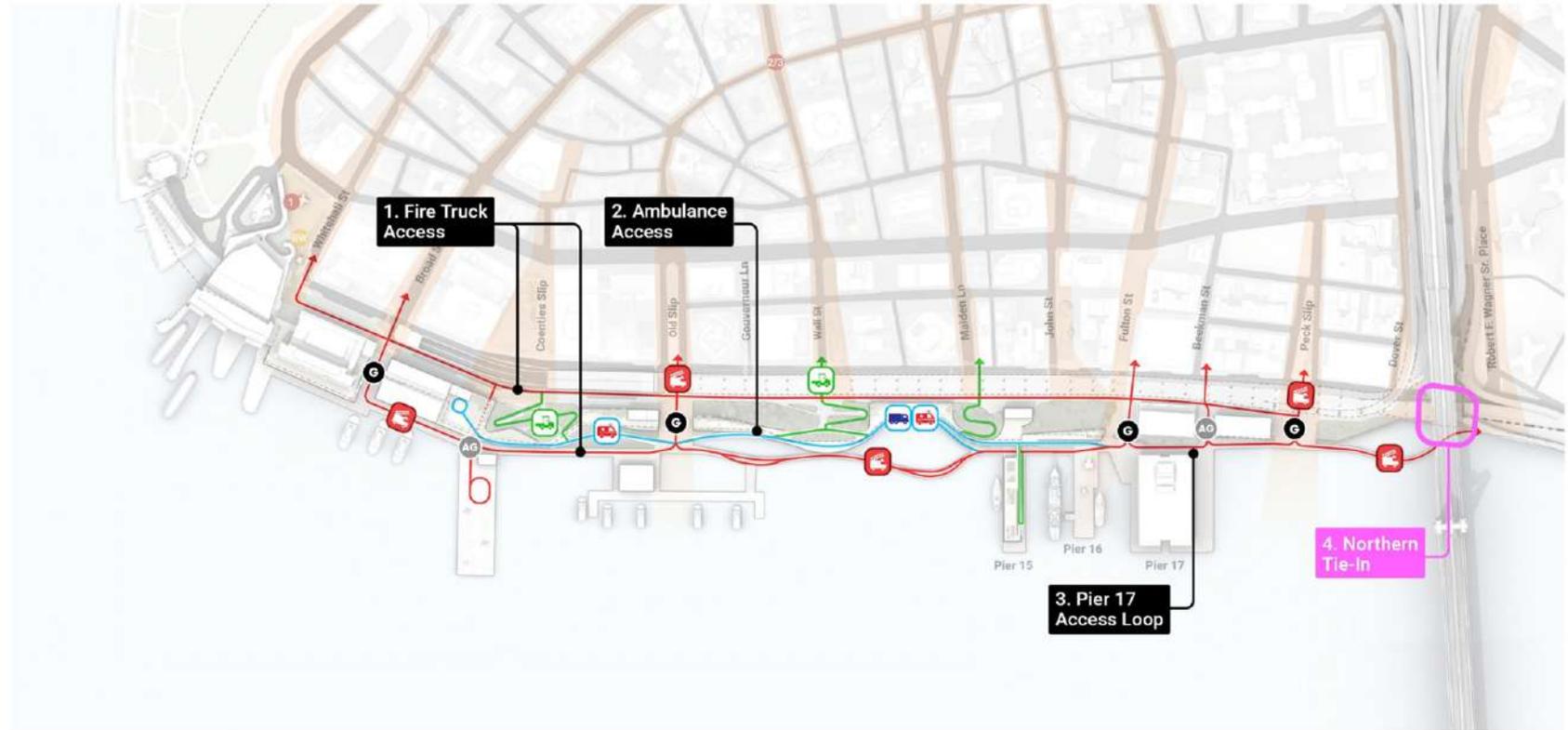
Emergency and Operations Vehicle Access and Circulation Plan Design Drivers and Design Opportunities

Key Design Drivers or "What's Fixed"

1. Continuous fire truck (& similar sized vehicles) access between the FDR and the line of flood defense and along the esplanade to provide emergency services to the waterfront based on feedback from emergency operators (FDNY and NYPD).
2. Ambulance (& similar sized vehicles) access on upper-level pathways to provide emergency access to upper-level open spaces and buildings based on feedback from emergency operators (FDNY and NYPD).
3. Emergency and operations vehicle and pedestrian circulation between the Tin Building and Pier 17 to maintain current level of access.

What Requires Further Technical Study

4. The specific flood defense alignment of the northern tie in, specifically in relation to waterfront circulation and how it interfaces with the adjacent Brooklyn Bridge-Montgomery Coastal Resilience project.

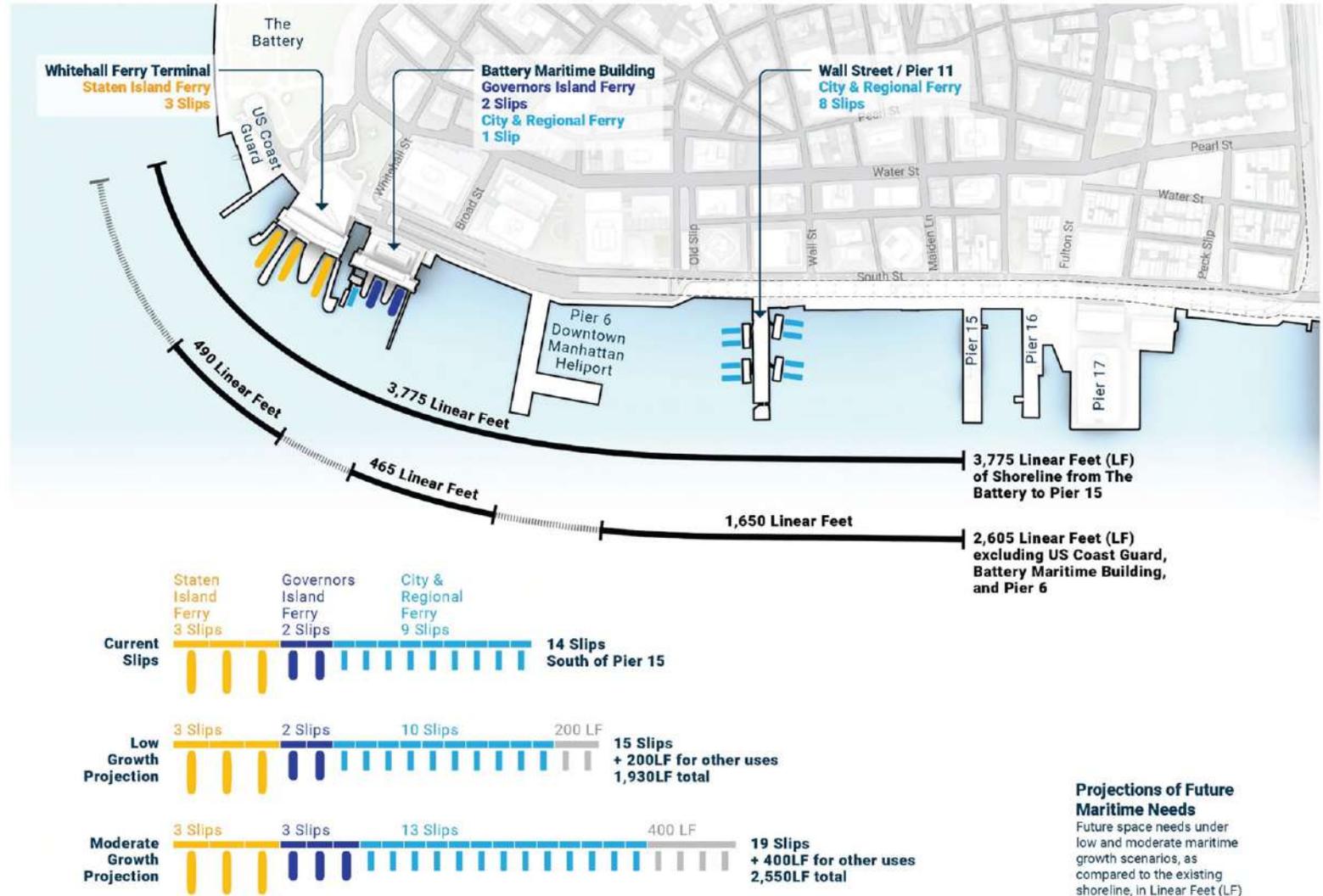


Maritime

Existing Maritime Facilities and Slip Configuration and Projections of Future Maritime Needs

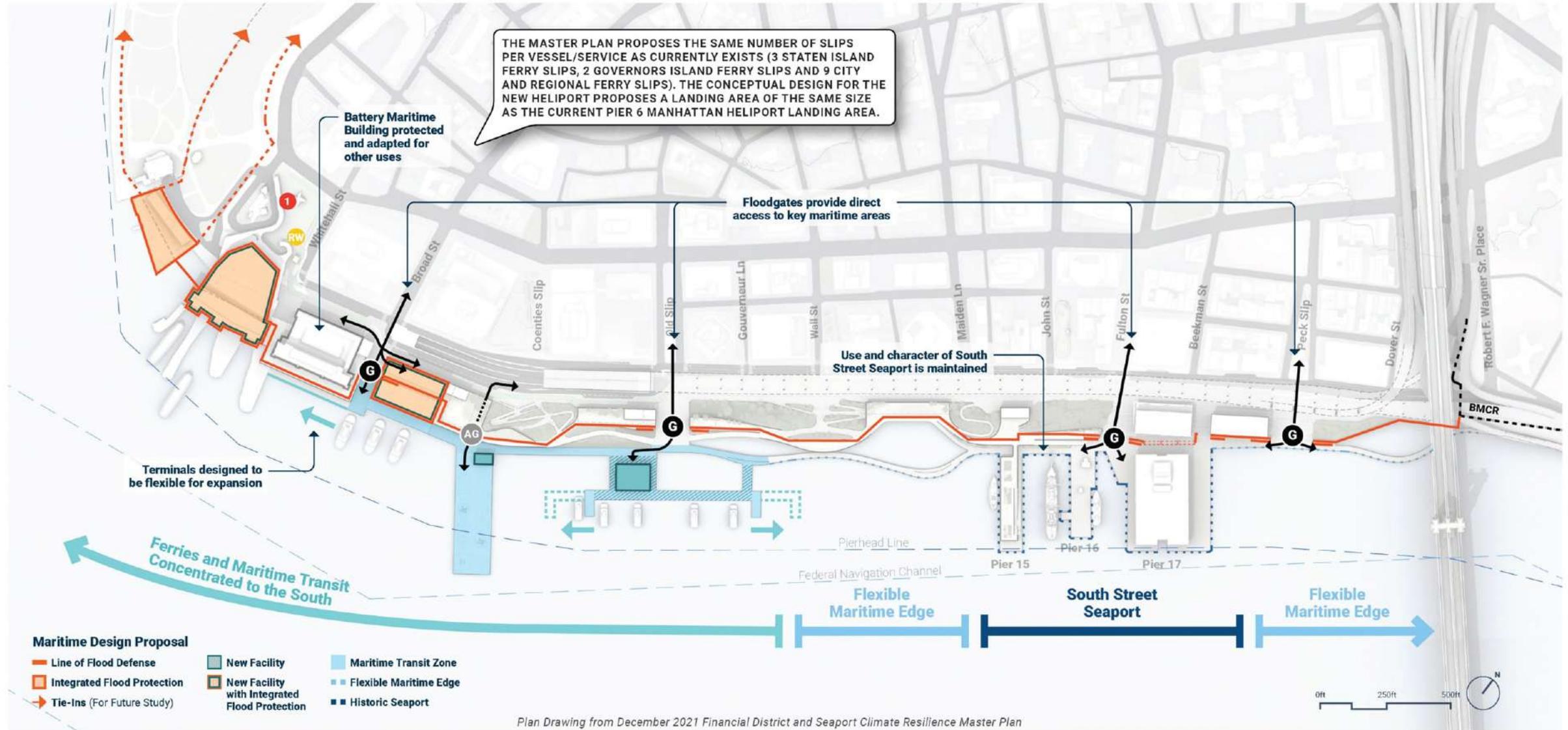
Due to the uncertainties involved in projecting the needs associated with future maritime uses, the project team developed two scenarios: low and moderate growth. These projections are intended to give a broad sense of potential needs, acknowledging that demand for ferry services can be heavily affected by investments in the expansion of services and pricing.

While the conceptual design assumes the existing level of maritime activity along this waterfront, these projections provided the project team with a sense of scale for potential future maritime uses. They also demonstrated the need to design a waterfront esplanade that can be flexible to accommodate future changes.



Maritime

Layout and Type of Future Maritime and Waterfront Assets



Maritime

Design Drivers & Design Opportunities

Key Design Drivers or “What’s Fixed”

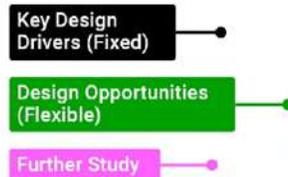
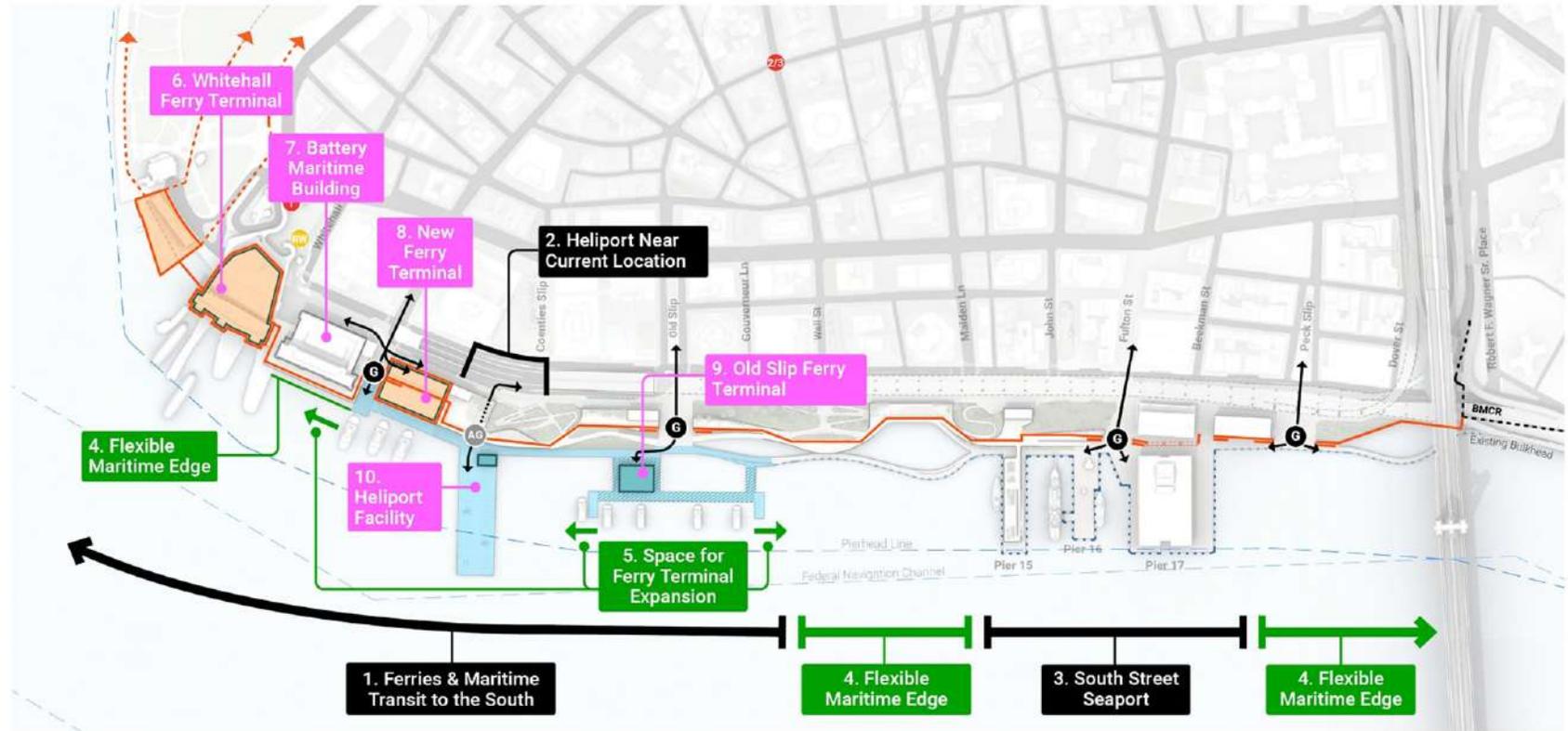
1. Ferries and maritime transit south of Pier 15 with a reconstructed Whitehall Ferry Terminal to stay in the same place.
 2. Heliport to be located in similar location to today to maintain adjacency to FDR on-ramp for easy and secure access to the highway.
 3. South Street Seaport adapted so that it can continue to be used to berth historic and other vessels now and into the future.
- G** Gate locations so that pedestrians and emergency and operations vehicles have direct access to maritime facilities.

Design Opportunities or “What’s Flexible”

4. Flexible maritime edge to accommodate vessel access and tie-ups.
5. Ferry terminal expansion zone to accommodate future maritime growth.

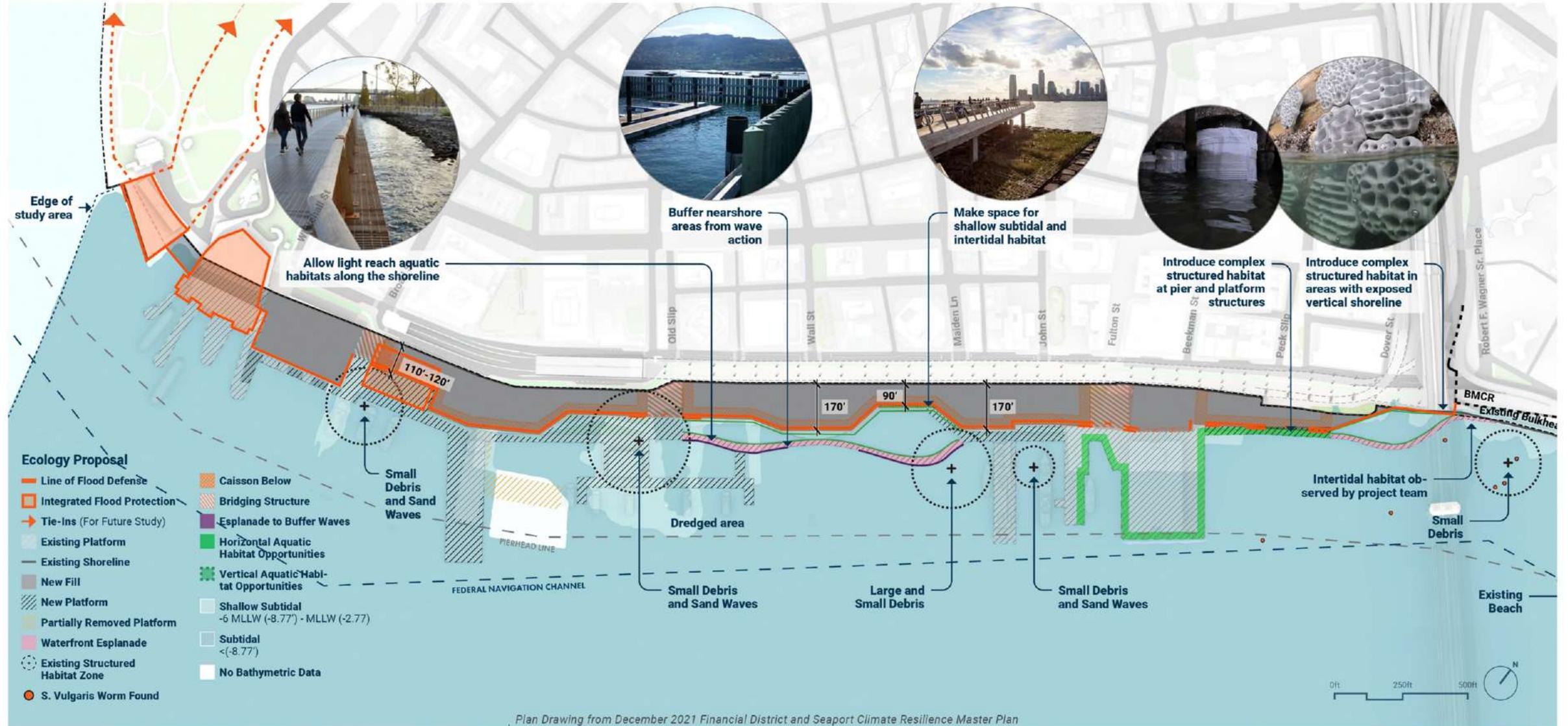
What Requires Further Technical Study

- A comprehensive maritime study to understand future maritime demands.
- 6-10. Specific design of reconstructed Whitehall Ferry Terminal to integrate flood defense and ensure facility’s resilience. Specific design of reconstructed heliport facilities and new and reconstructed ferry terminals at Broad Street and Old Slip. Specific design of the flood protection for the Battery Maritime Building and its potential future uses.



Ecology

Layout Plan for Ecological Enhancement Opportunities at the Water's Edge



Ecology

Design Drivers & Design Opportunities

Key Design Drivers or “What’s Fixed”

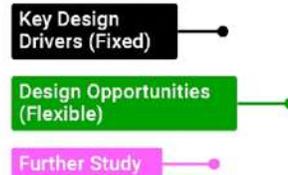
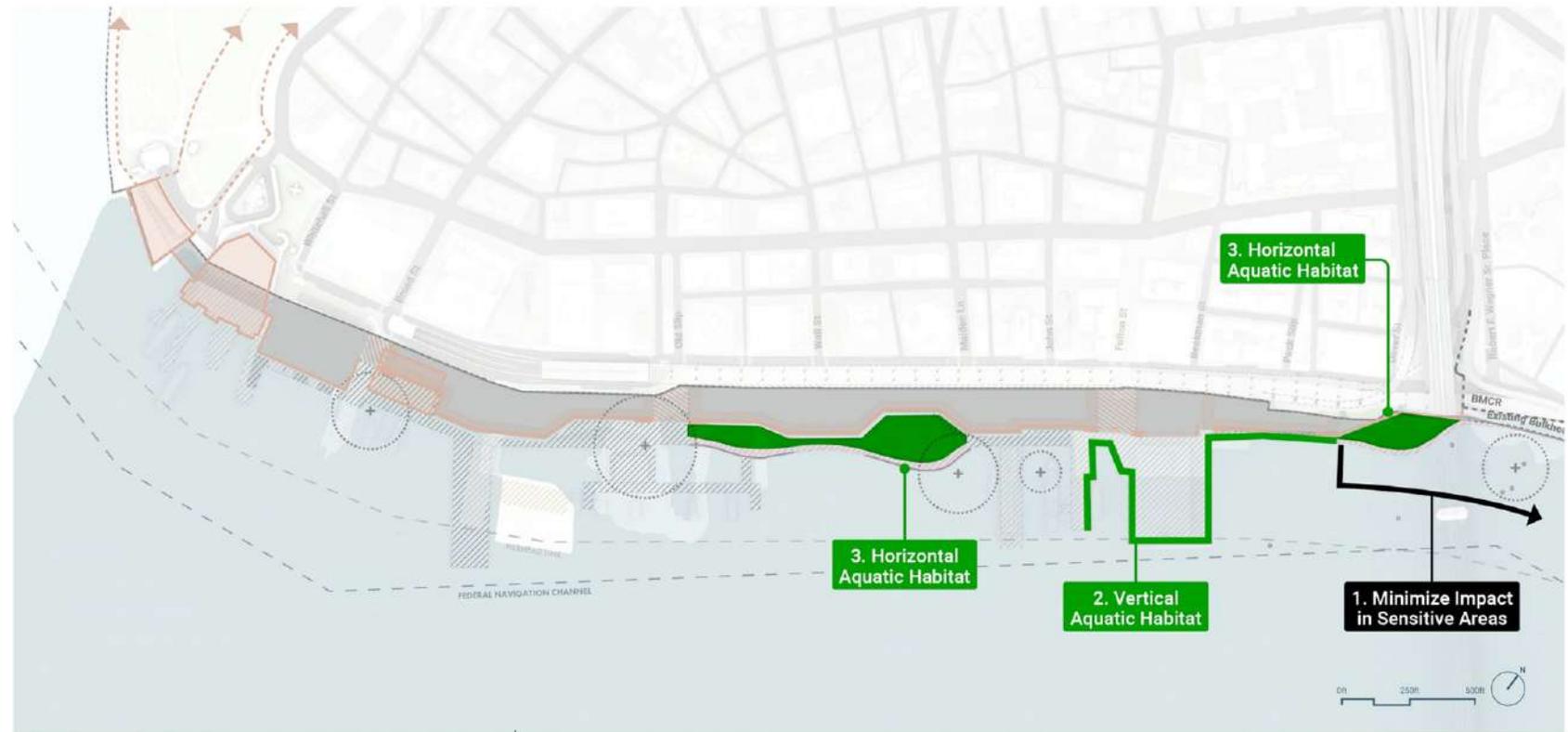
1. Minimize impact to intertidal habitat & Brooklyn Bridge Beach.
- Esplanade design & materials to maximize light penetration to aquatic habitats.

Design Opportunities or “What’s Flexible”

2. Creation of vertical aquatic habitat opportunities at pier & platform structures & vertical shoreline such as tidal shelves and complex structured habitat.
 3. Creation of space for shallow subtidal & intertidal habitat at coves.
 4. Introduction of floating wetlands & other horizontal habitat opportunities at coves.
- Support of local terrestrial habitats and ecosystems in open space designs.

What Requires Further Technical Study

- Continued sampling and testing.



Public Open Space and Public-Serving Uses

Existing Waterfront Open Spaces



The East River Esplanade includes waterfront seating, planting, and restaurant space at Industry Kitchen.
(Photo Credit: One Architecture & Urbanism)



Open spaces with small lawns and seating on top of Pier 15.
(Photo Credit: One Architecture & Urbanism)



Plaza spaces with views out to the East River at Pier 17.
(Photo Credit: One Architecture & Urbanism)



Get-downs bring people closer to the water near Pier 11.
(Photo Credit: SCAPE)



Multi-level Pier 15 with views back to the city.
(Photo Credit: One Architecture & Urbanism)



Elevated views of the East River from Pier 15.
(Photo credit: Several Seconds)

Public Open Space and Public-Serving Uses

Examples of Proposed Types of Open Spaces in New York City



Landscaped Walkways example at Brooklyn Botanic Garden (Photo Credit: Barrett Doherty)



Elevated Café example at Brooklyn Bridge Park (Photo Credit: William Pevear Architects)



Separated Esplanade example at East River Park (Photo Credit: Nathan Kensinger)



Multi-level Playground example at Teardrop Park (Photo Credit: Michael Van Valkenburgh Associates)



Sloped Lawns example at Hunter's Point South (Photo Credit: NYCEDC)



Oyster Restoration Stations example at Brooklyn Waterfront on the East River (Photo Credit: Billion Oyster Project)

Public Open Space and Public-Serving Uses

Illustrations of the Types of Open Spaces the Master Plan Proposes



The slopes are city-facing spaces that integrate sloped pathways and stairs with planted open space and small buildings to create a dynamic street edge.



The upper-level ridge can integrate larger lawns and other open spaces that take advantage of views to the East River.



The waterfront esplanade will continue to connect people to historic vessels and other historical and educational assets along the waterfront.



Gateways bring people directly to key waterfront destinations through deployable floodgates such as at Fulton Street.



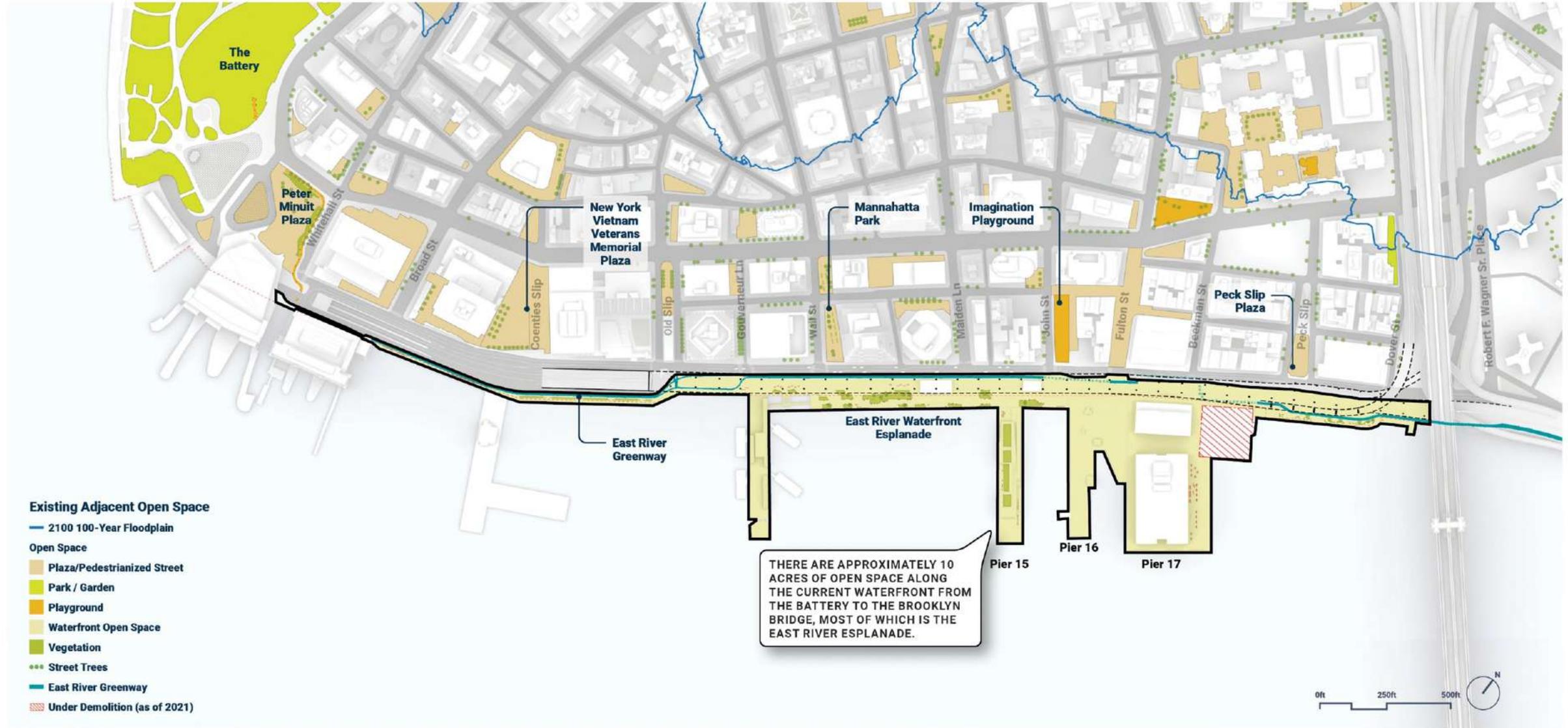
Upper ridge includes seating, planting, and amenity buildings such as restaurants, cafes, and comfort stations.



Coves will create protected aquatic habitats that will provide opportunities to bring people closer to the water for immersive and educational experiences of the East River.

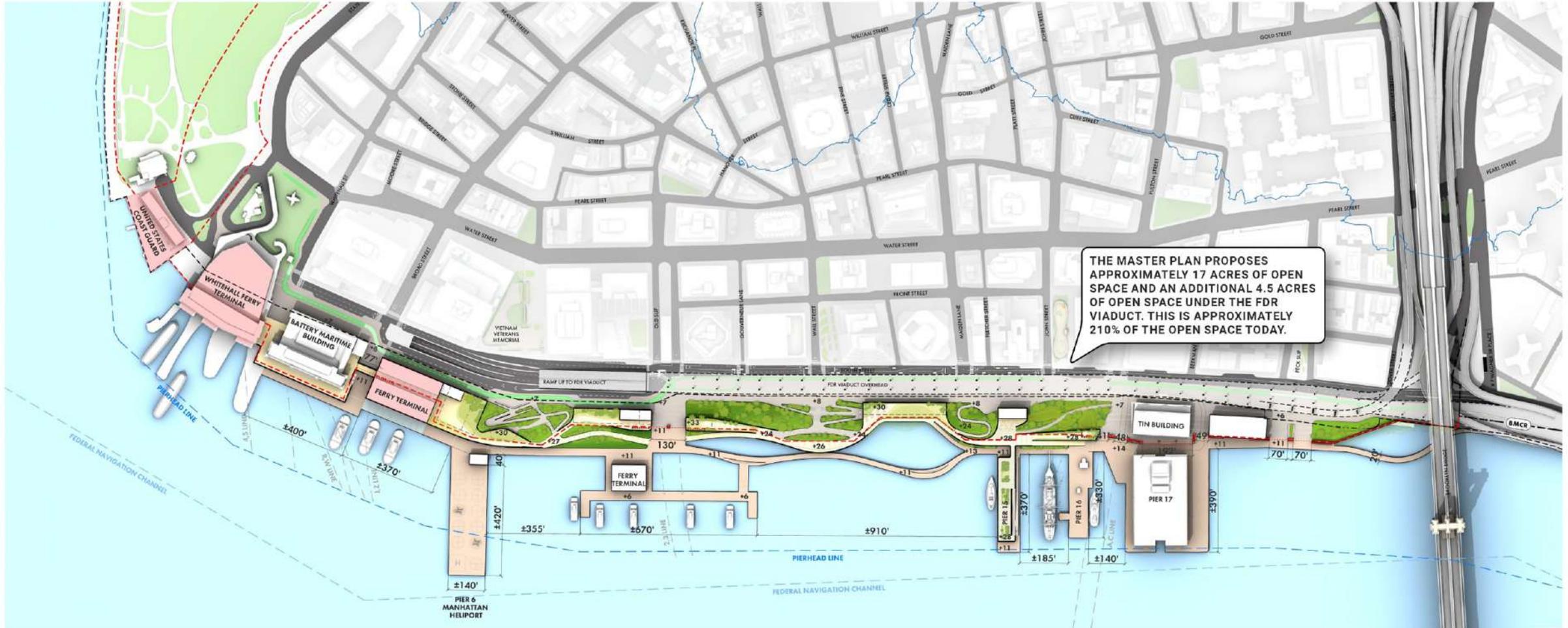
Public Open Space and Public-Serving Uses

Existing Waterfront and Adjacent Open Spaces



Public Open Space and Public-Serving Uses

Proposed Open Space and Public-Serving Building Layout



Open Space

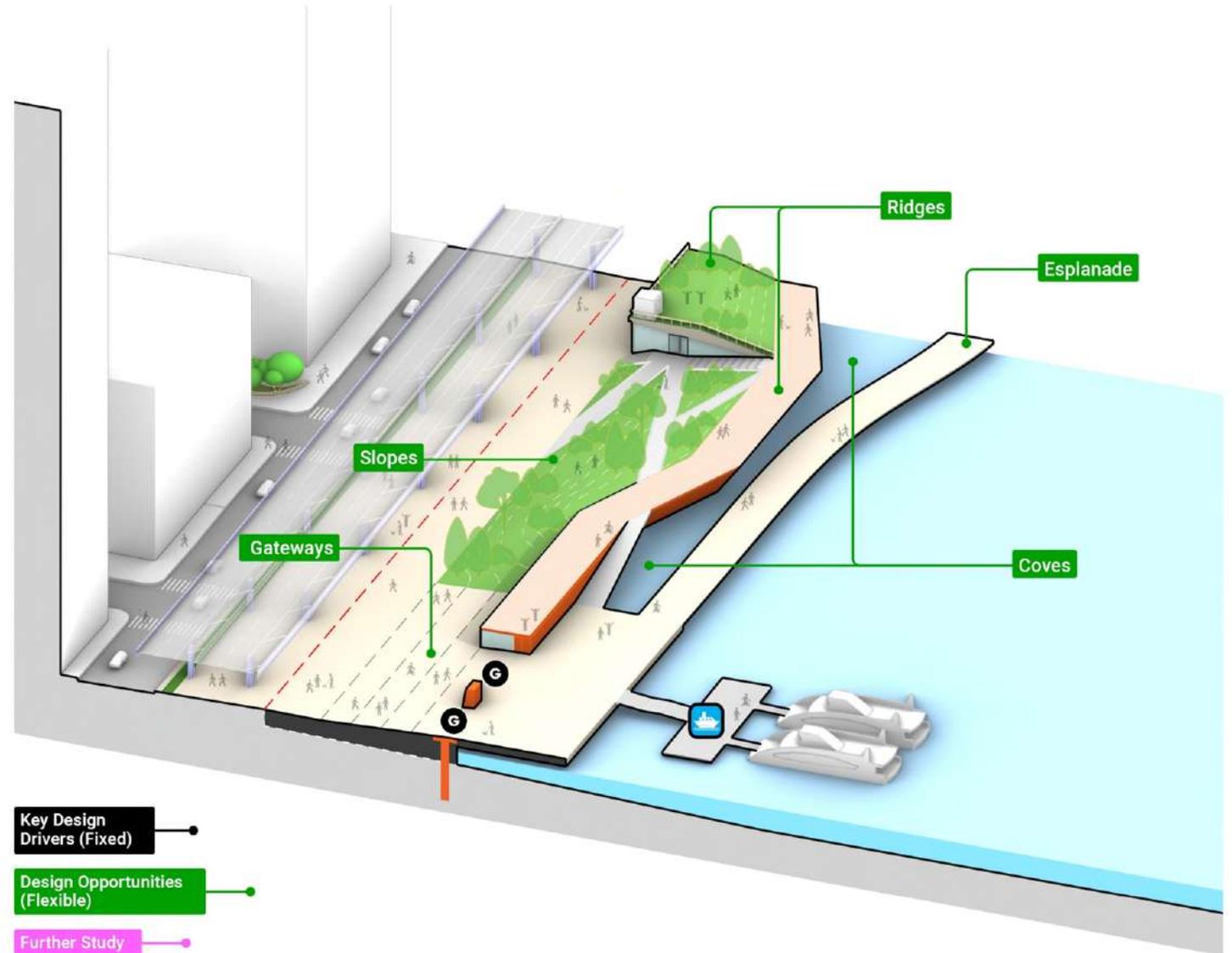
Concept

Key Design Drivers or “What’s Fixed”

- The master plan provides more open space than exists today.
- The master plan would provide the same type of public-serving uses that are along the waterfront today.

Design Opportunities or “What’s Flexible”

- The master plan proposes five types of spaces: Gateways, Slopes, Ridges (upper-level spaces), the Waterfront Esplanade, and Coves.
- The specific design of these waterfront open spaces is flexible.
- Community and stakeholder feedback would shape specific program and size of open space along the water as well as the design of the layout, materiality, and aesthetic character of open spaces.



Open Space

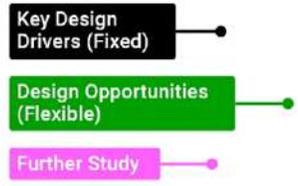
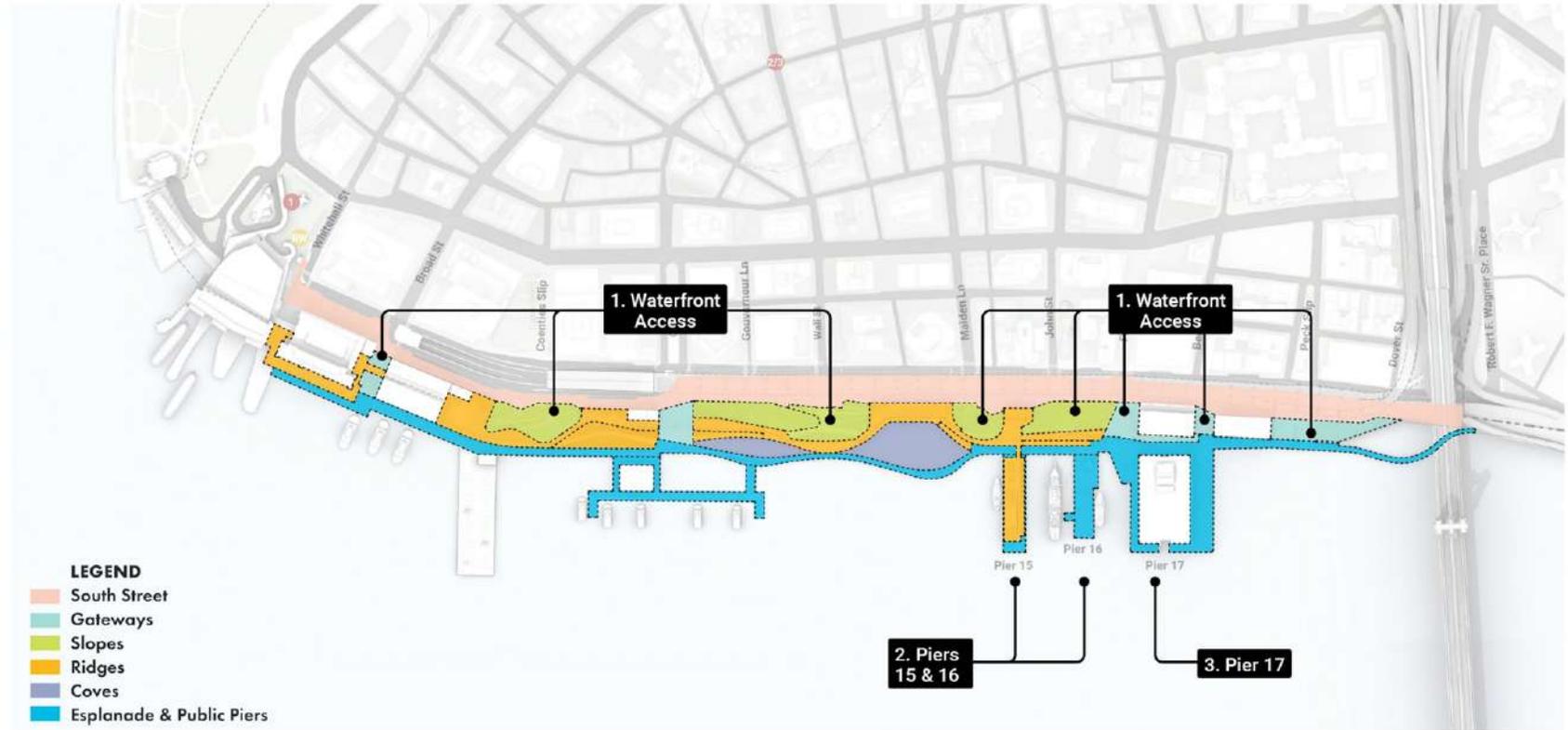
Design Drivers & Design Opportunities

Key Design Drivers or “What’s Fixed”

- The master plan replaces and enhances the types of public destinations that are available today and increases the amount of open and green space compared to today.
 - The space needed for flood defense infrastructure drives the scale and location of waterfront open spaces.
1. Access defines the location of the city-facing open spaces (Gateways and Slopes).
 2. Piers 15 and 16 can provide similar public-serving uses once reconstructed to a higher elevation.
 3. Pier 17’s existing esplanade, open space, and dining and beverage establishments would remain in place since the pier is elevated high enough to avoid future tidal flooding.

Design Opportunities or “What’s Flexible”

- The open spaces (Gateways, Slopes, Ridges, Coves, and Esplanade) defined by the master plan would provide unique opportunities to situate open space and small public serving buildings with a variety of programs along this dynamic new waterfront.
- The South Street corridor would connect the upland neighborhoods to the new waterfront and would integrate similar program to today as well as fold in opportunities for green infrastructure where possible.



Buildings

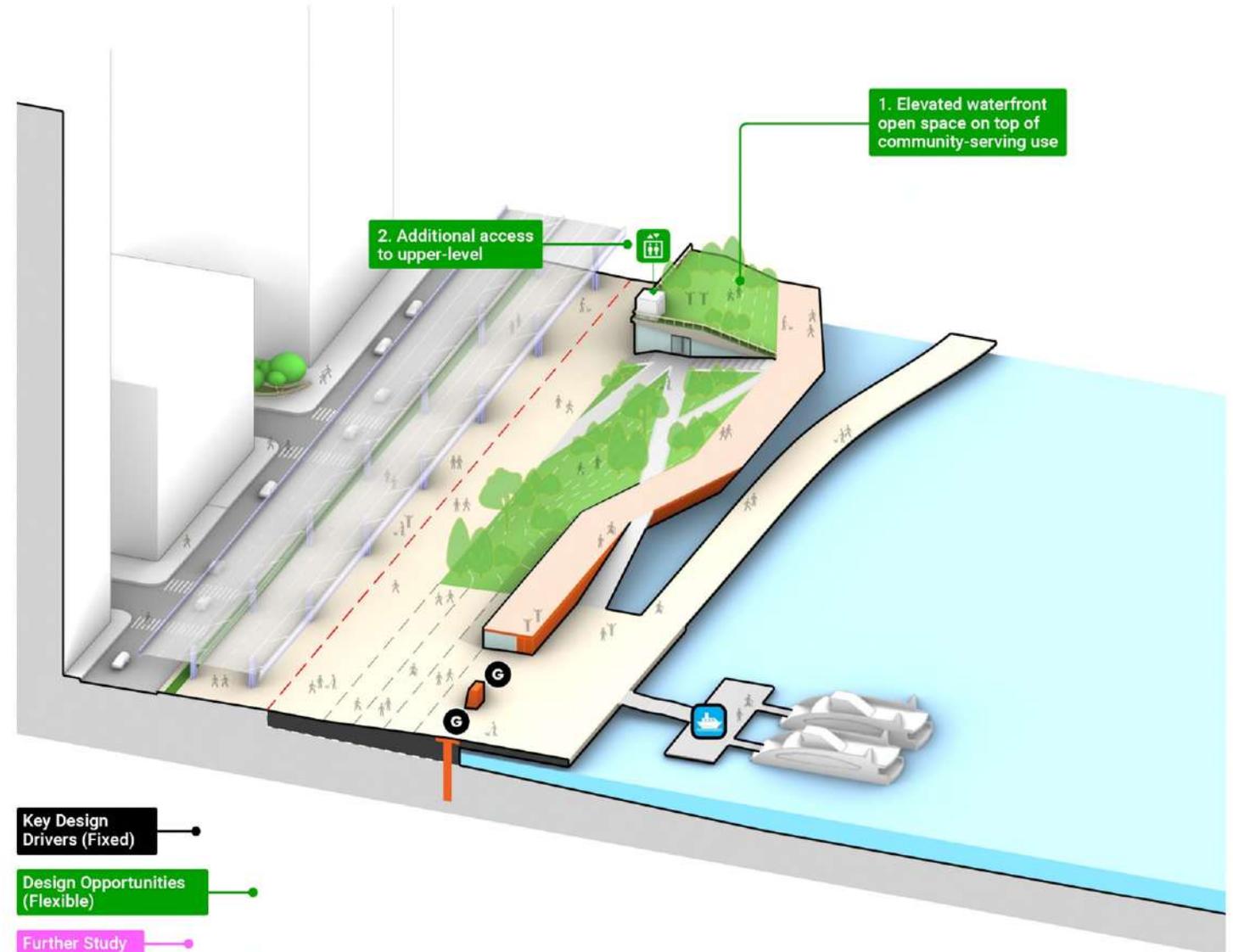
Concept

Key Design Drivers or “What’s Fixed”

- Buildings would be needed for maritime uses, such as a new ticketing areas and conditioned waiting facilities.
- Buildings would house operations and maintenance facilities for the flood defense infrastructure and open space.
- A new pump station would be needed to manage stormwater.
- All new buildings would strive for carbon neutrality and energy efficiency, in alignment with citywide net-zero goals.

Design Opportunities or “What’s Flexible”

1. 1-2 story buildings could provide community serving uses and be integrated with the multi-level landscape by providing elevated open space on top of them, embedded in the slopes, or located along the upper ridge. Such community serving uses could include amenities such as comfort stations or food and beverage establishments such as today’s Industry Kitchen.
 2. Additional access to upper-level (elevators & stairs/escalators) could be integrated with low buildings.
- Specific design and programming of buildings is flexible and would be shaped by community and stakeholder feedback.



Potential Building Footprints

Design Drivers & Design Opportunities

Key Design Drivers or "What's Fixed"

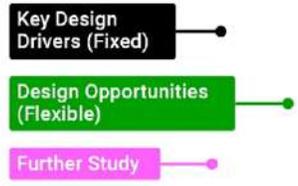
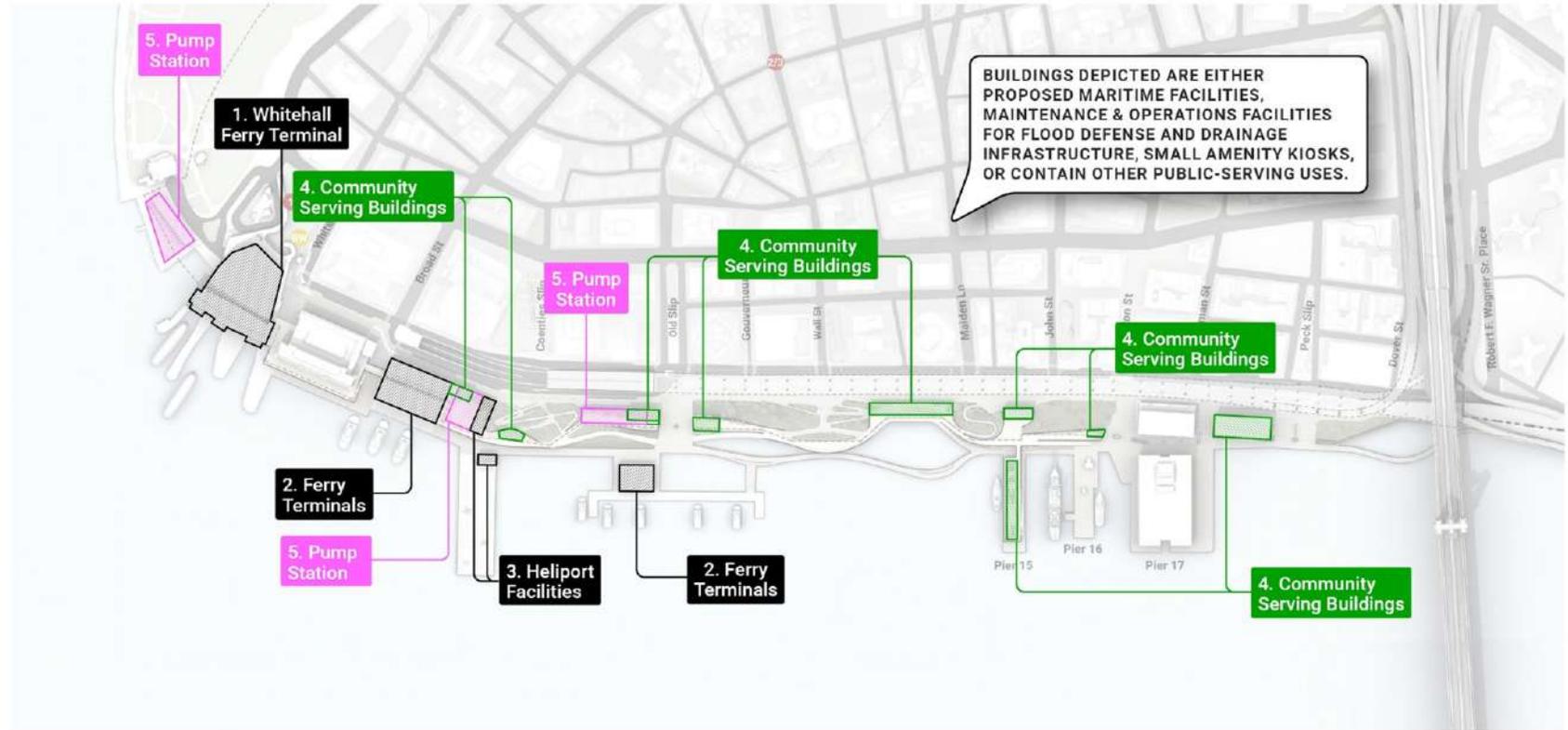
1. Whitehall Ferry Terminal (location fixed, specific design to be studied further).
2. Ferry terminals (location adjacent gateways fixed, specific design to be studied further).
3. Heliport facilities (location adjacent FDR on-ramp fixed, specific design to be studied further).

Design Opportunities or "What's Flexible"

4. 1-2 story community serving buildings, including amenities such as cafes, restaurants, and comfort stations could be embedded within the slopes, located along the upper ridge or located along South Street embedded below upper level open space.

What Requires Further Technical Study

5. Pump station (location & design).
 - Facilities for operations and maintenance for flood defense system and open space.

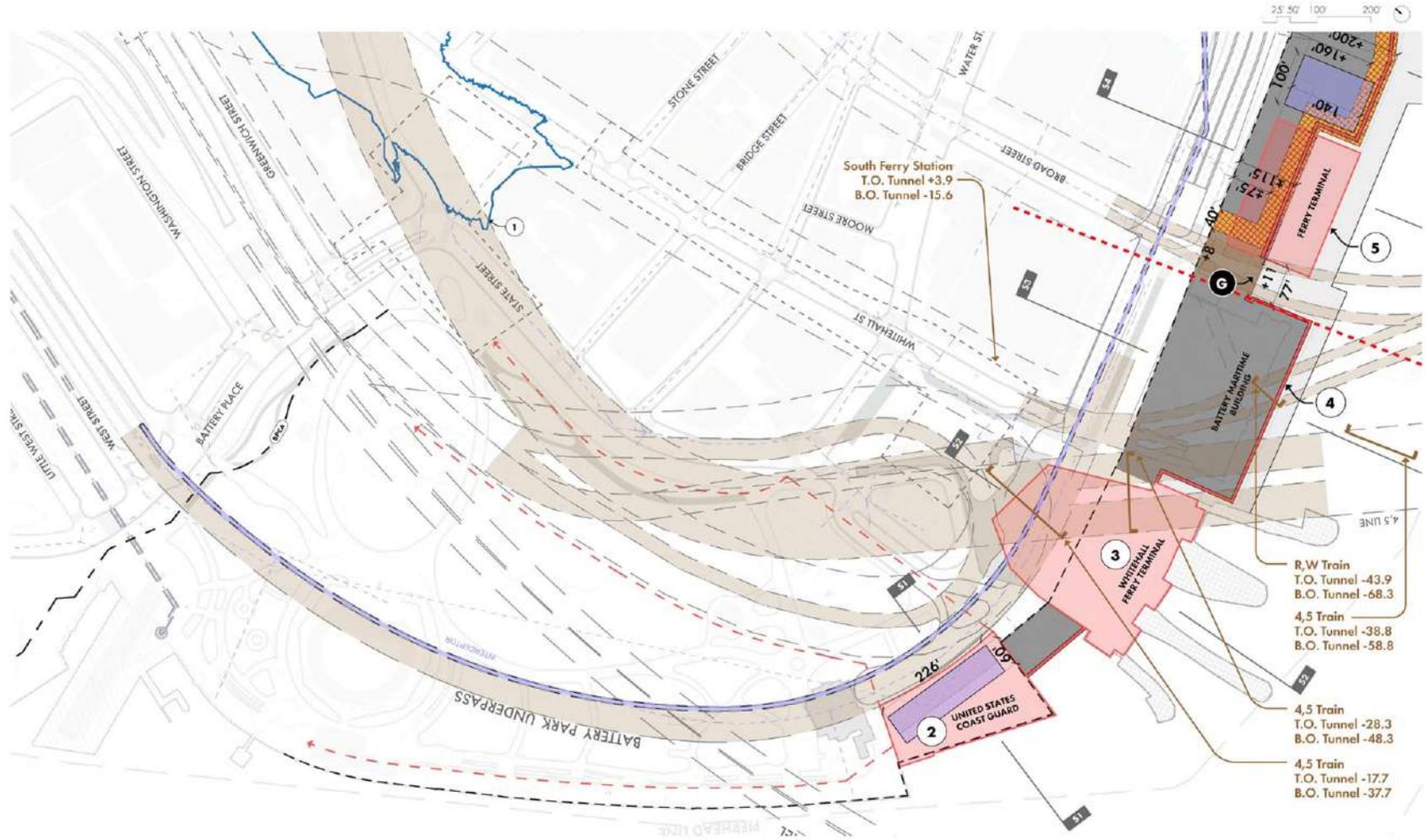


Master Plan Walkthrough

Southern Ferry Terminal Area

Southern Tie-In to the Battery Maritime Building

Flood Defense & Drainage Infrastructure Plan



- LEGEND**
- 2100 100-Year Floodplain
 - - - Existing Bulkhead
 - Line of Flood Defense
 - Integrated Flood Protection
 - Floodgate
 - ⋯ Flip Up Gate Footprint
 - New Fill
 - Bridging Structure
 - Caisson Structure
 - - - Southern Tie-In Options (for Future Study)
 - ⋯ BMCR/BPCA Line of Flood Defense
 - Potential Pump Station Footprint
 - Platform Structure

EXISTING SUBSURFACE INFRASTRUCTURE

- Sewer Interceptor
- Sewer Line
- CSO Outfalls
- Oil-O-Static Line
- ⋯ Subway Station Footprint
- Approx. Tunnel Locations

- ⓐ Site floodgates to align with street corridors.
- ⓐ Additional gates for building access
- ① Southern tie-in requires further study. Tie-in is assumed to reach high ground near Bowling Green.
- ② Flood defense to navigate USCG site. Site also identified as a potential pump station location and must be further studied.
- ③ Whitehall Ferry Terminal to be rebuilt and flood protection integrated within site. Area must be studied further.
- ④ Battery Maritime Building to be protected, see illustrative plan.
- ⑤ Flood defense integrated with new Ferry Terminal at Broad Street.

Southern Tie-In to the Battery Maritime Building

Illustrative Plan



LEGEND

- 2100 100-Year Floodplain
- Existing Bulkhead
- - - Line of Flood Defense (Buried)
- Line of Flood Defense (Exposed)
- Integrated Flood Protection
- Floodgate
- - - Floodgate (Below)
- - - Flip Up Gate Footprint
- - - Southern Tie-in Options (for Future Study)
- - - BMCR/BPCA Line of Flood Defense

- G** Site floodgates to align with street corridors.
- AG** Additional gates for building access.
- f** Crosswalks connecting to the city fabric.
- 1** Southern tie-in requires further study. Tie-in is assumed to reach high ground near Bowling Green.
- 2** Flood defense to navigate USCG site. Site also identified as a potential pump station location and must be further studied.
- 3** Whitehall Ferry Terminal to be rebuilt and flood protection integrated within site. Area must be studied further.
- 4** Battery Park Underpass is extended to Broad Street. This provides direct access to a proposed ferry terminal and addresses an existing circulation conflict zone in front of the BMB.
- 5** Battery Maritime Building to be protected. An elevated public space connects the second level of the building to the new multilevel waterfront.
- 6** A lower level provides flexibility for maritime access in front of the BMB.
- 7** An upper level bridge over the Broad Street floodgate connects the BMB to a new ferry terminal.

Whitehall to Wall Street



THE PATHWAY FOR THE SOUTHERN TIE INTO HIGHER GROUND WILL REQUIRE MORE STUDY. IT NEEDS TO NEGOTIATE COMPLEX SUBSURFACE INFRASTRUCTURE WHILE TAKING A SENSITIVE APPROACH TO INTEGRATING FLOOD DEFENSE WITH THE HISTORIC BATTERY.

THE FLOOD DEFENSE ALIGNMENT SOUTH OF BROAD STREET WILL BE REFINED THROUGH FURTHER STUDY OF THE BMB, WHITEHALL FERRY TERMINAL AND USCG SITE AND THEIR CIRCULATION AND PROGRAMMATIC NEEDS.

UNIVERSALLY DESIGNED UP-AND-OVER ACCESS DEFINES THE SHORELINE EXTENSION.

GATEWAYS CREATE DIRECT CONNECTIONS TO THE WATERFRONT & MARITIME FACILITIES.

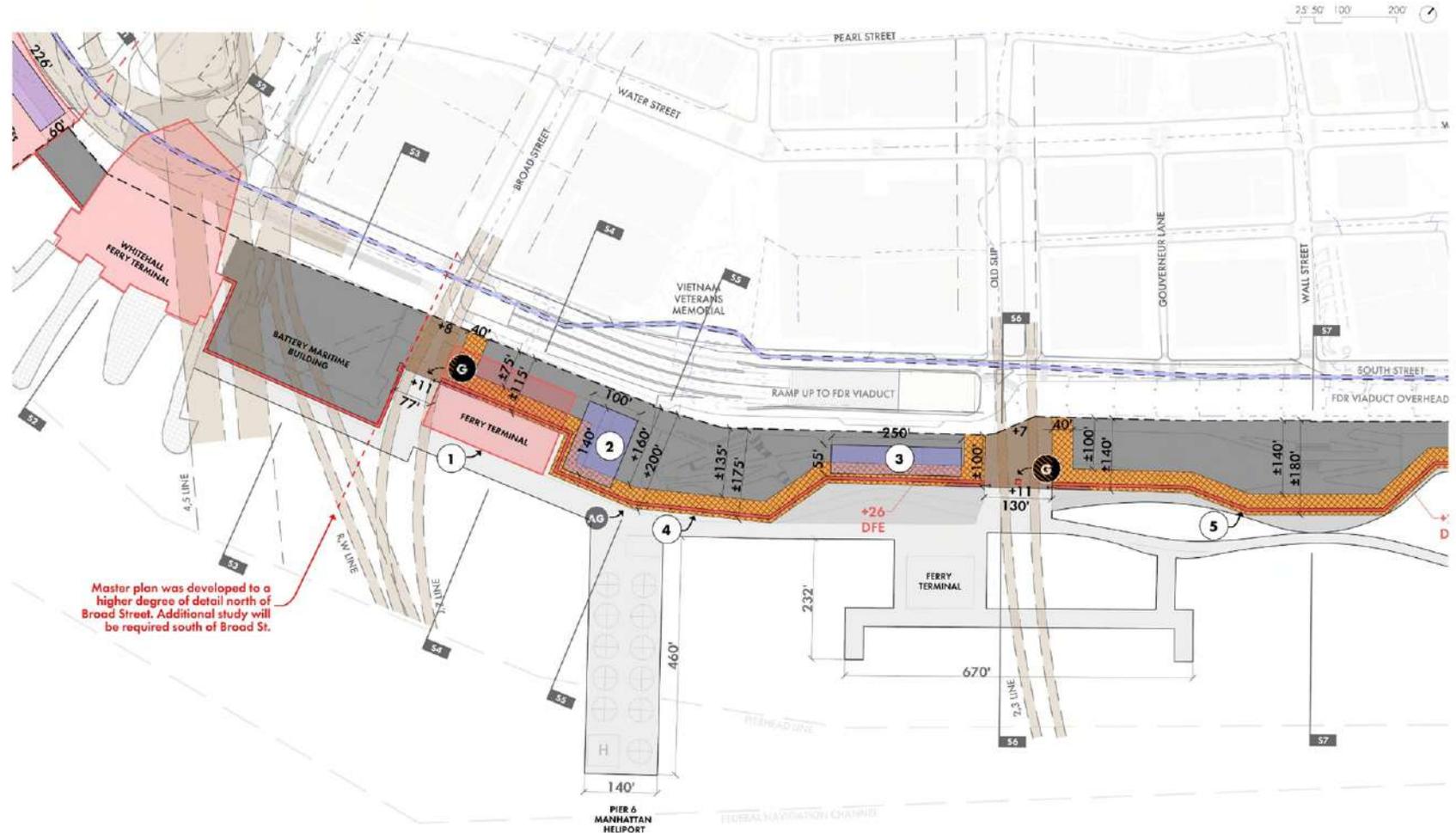
THE MASTER PLAN SITES FERRY TERMINALS TO THE SOUTH.

THE MASTER PLAN PROPOSES MARITIME FACILITIES THAT ACCOMMODATE CURRENT CAPACITY WITH SPACE TO EXPAND FOR FUTURE GROWTH IN DEMAND.

Whitehall to Wall Street

Flood Defense & Drainage Infrastructure Plan

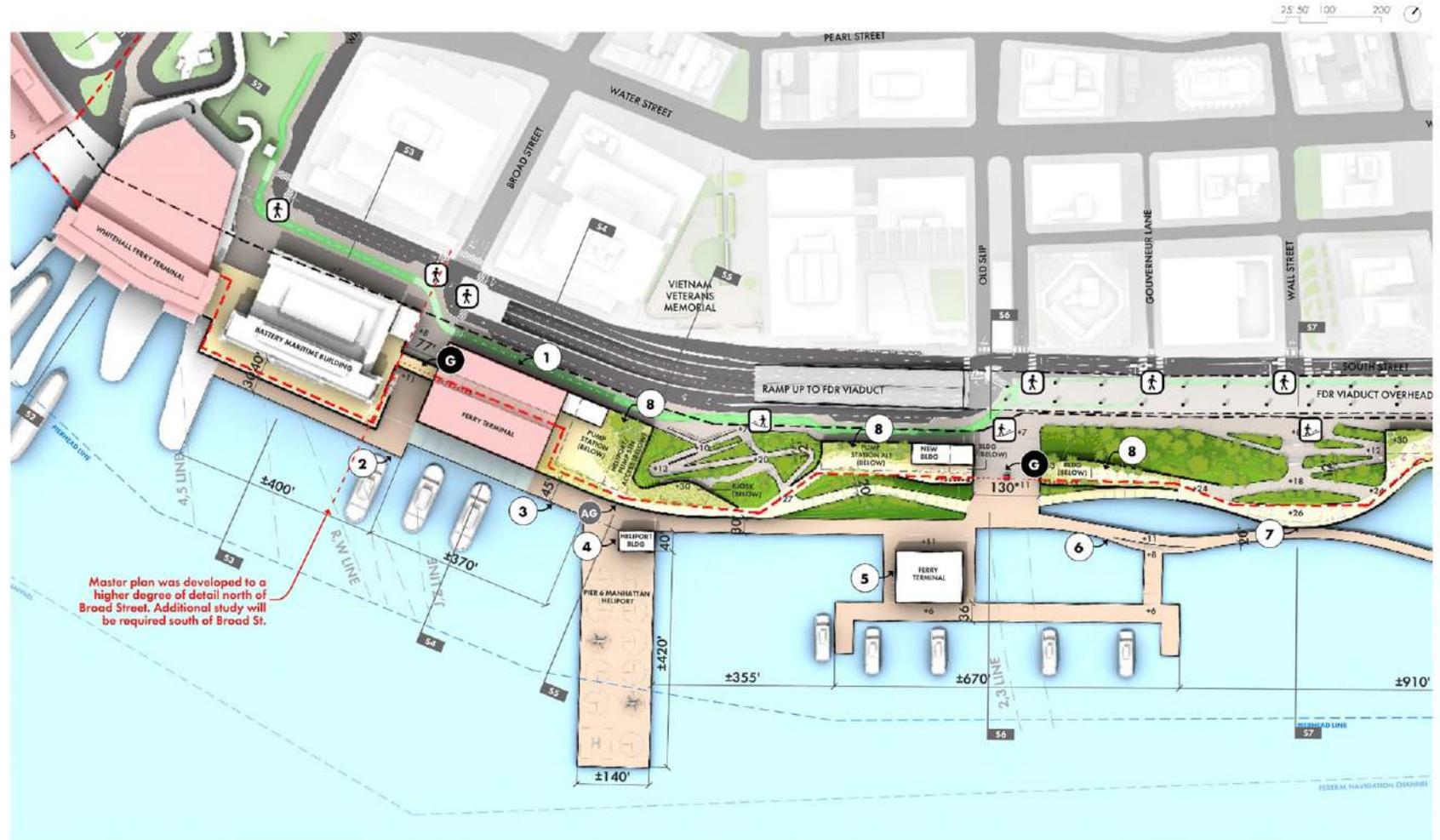
- LEGEND**
- Existing Bulkhead
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 - Floodgate
 - Flip Up Gate Footprint
 - New Fill
 - Bridging Structure
 - Caisson Structure
 - Tie-Ins (For Future Study)
 - BMCR/BPCA Line of Flood Defense
 - Potential Pump Station Footprint
 - Platform Structure At or Below +11
 - Platform Structure Above +11
- EXISTING SUBSURFACE INFRASTRUCTURE**
- Sewer Interceptor
 - Sewer Line
 - CSO Outfalls
 - Oil-O-Static Line
 - Subway Station Footprint
 - Approx. Tunnel Locations
- G** Site floodgates to align with street corridors. Bridging structure spans over subways at Broad Street and Old Slip.
- AG** Building level gate provides vehicle access to heliport.
- 1 Flood defense integrated with new Ferry Terminal at Broad Street.
 - 2 Potential pump station site north of proposed ferry terminal.
 - 3 Potential pump station site south of Old Slip.
 - 4 Flood defense pushes out to provide up and over access at Coenties Slip.
 - 5 Flood defense pushes out to provide up and over access at Wall Street.



Whitehall to Wall Street

Illustrative Plan

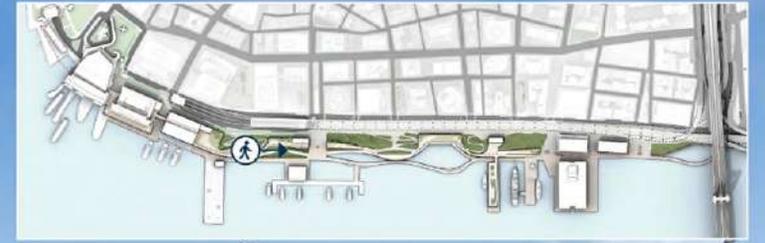
- LEGEND**
- Existing Bulkhead
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 - Tie-Ins (For Future Study)
 - BMCR/BPCA Line of Flood Defense
- G** Site floodgates to align with street corridors. Bridging structure spans over subways at Broad Street and Old Slip.
- AG** Building level gate provides vehicle access to heliport.
- Ⓜ** Crosswalks connecting to the city fabric.
- Ⓜ** Site access points at Broad, Coenties Slip, Broad Street, and Wall Street.
- 1** New ferry terminal setback from street wall to allow for safe pick-up/drop-off, public sidewalk and a two way separated bike path.
- 2** A slip aligned with new Broad Street access point allows flexibility for drive-off freight/ferry service.
- 3** A continuous esplanade connects the waterfront between Broad Street and Old Slip.
- 4** Heliport control tower on pier allows for security and a continuous esplanade.
- 5** A proposed ferry terminal is located south of Old Slip and on a pier. This maintains clear sight lines to the water from the street while allowing for a continuous esplanade.
- 6** North of Old Slip, a detached waterfront esplanade mitigates height between levels and provides an opportunity for ecological coves.
- 7** An overlook at Wall Street provides commanding views of the waterfront.
- 8** Elevated public waterfront with building program below.



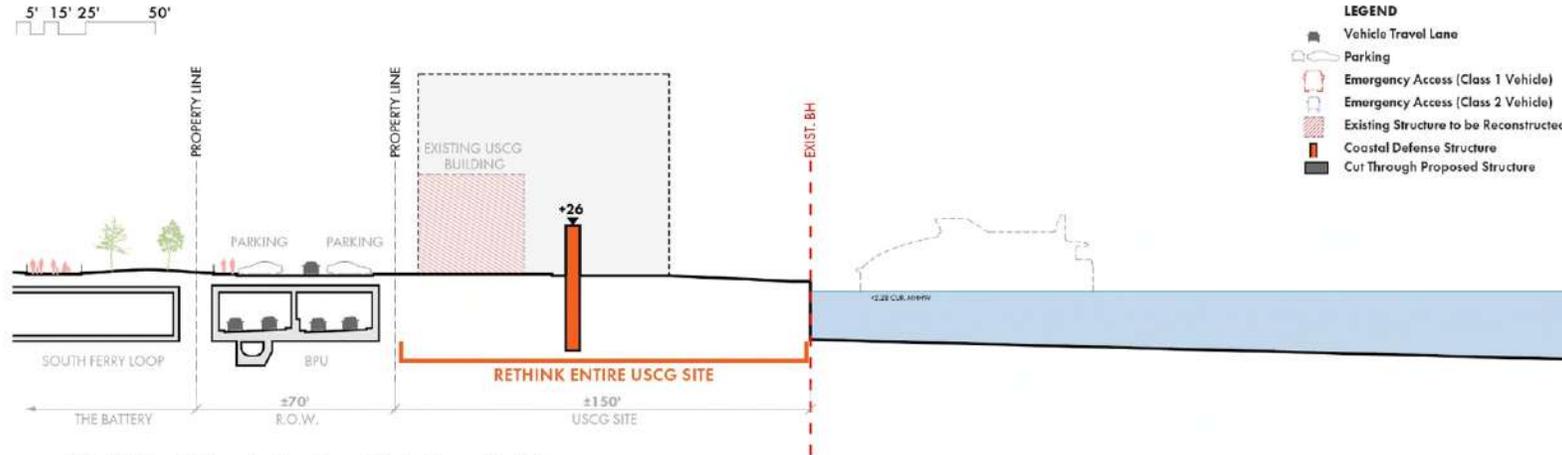
Entrance Slopes



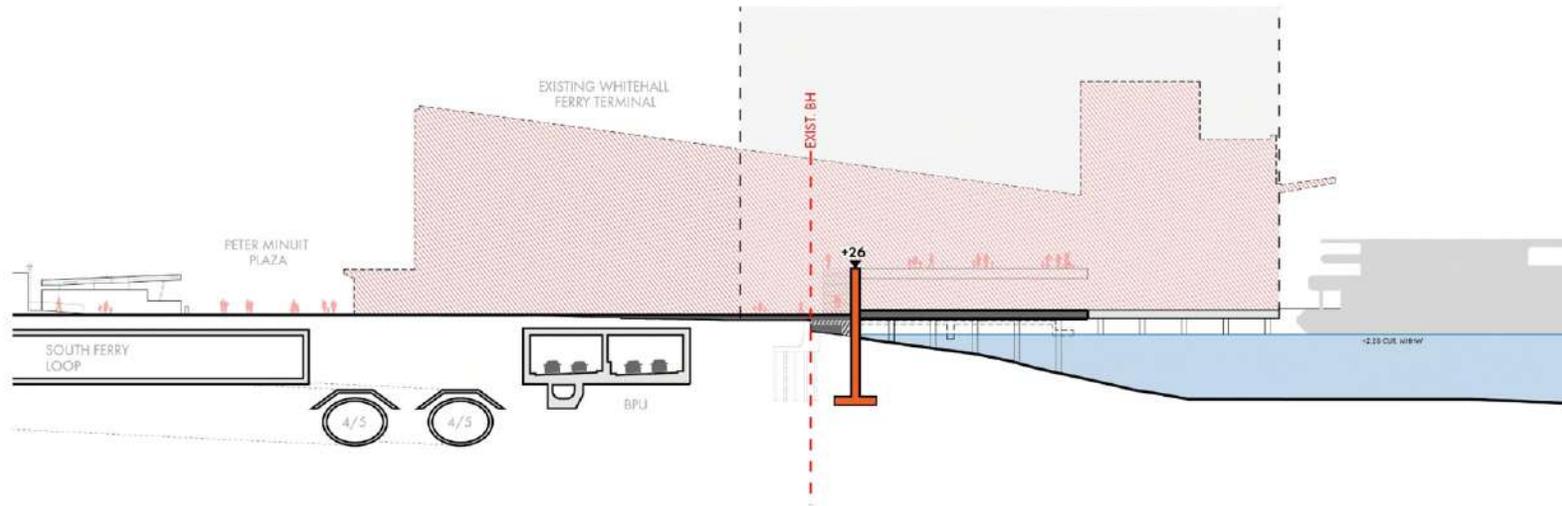
Multi-Level Waterfront



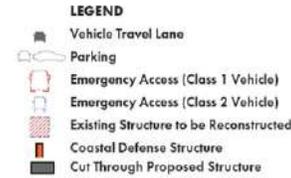
USCG & Whitehall Ferry Terminal



S1: US Coast Guard: Use site, rethink site and building



S2: Whitehall Ferry Terminal: Full Reconstruction (Pathway flexible)



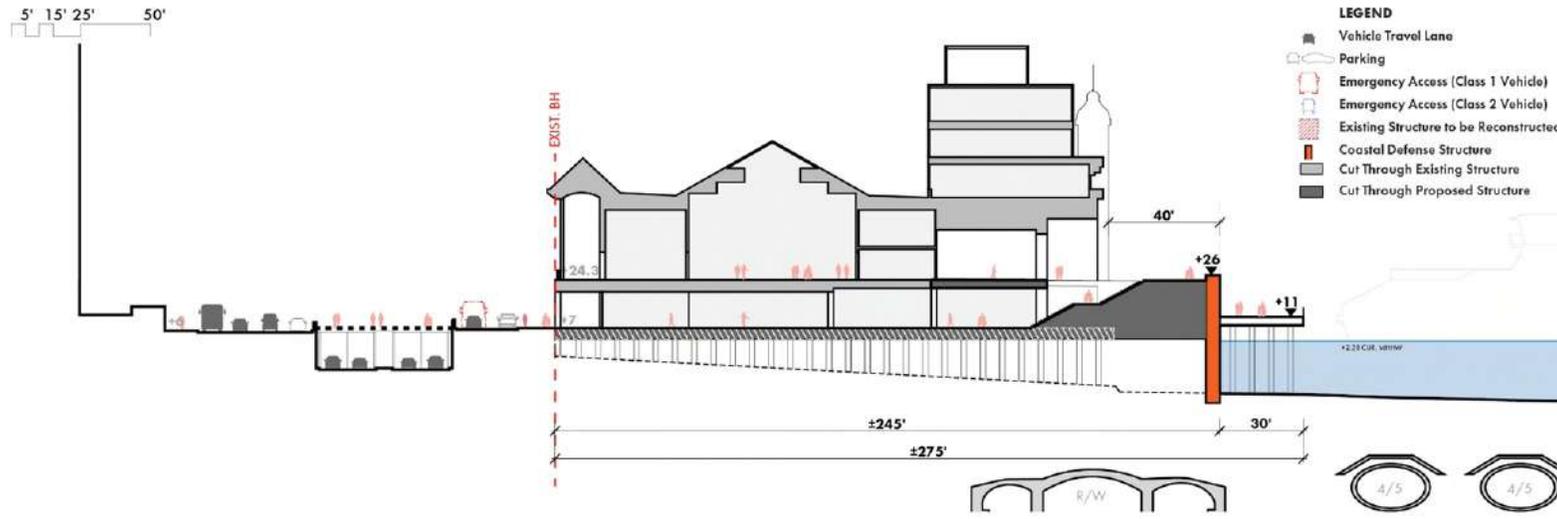
US Coast Guard: Use site, rethink site and building

- This site is federally owned, so an agreement with the federal government would be needed to use the site.
- Rethink the entire USCG site and building to integrate the flood protection alignment into the new structure.
- A reimagining of the site opens the possibility to consider additional uses.
- These uses can include maritime services as well as replacing the USCG offices, among others.

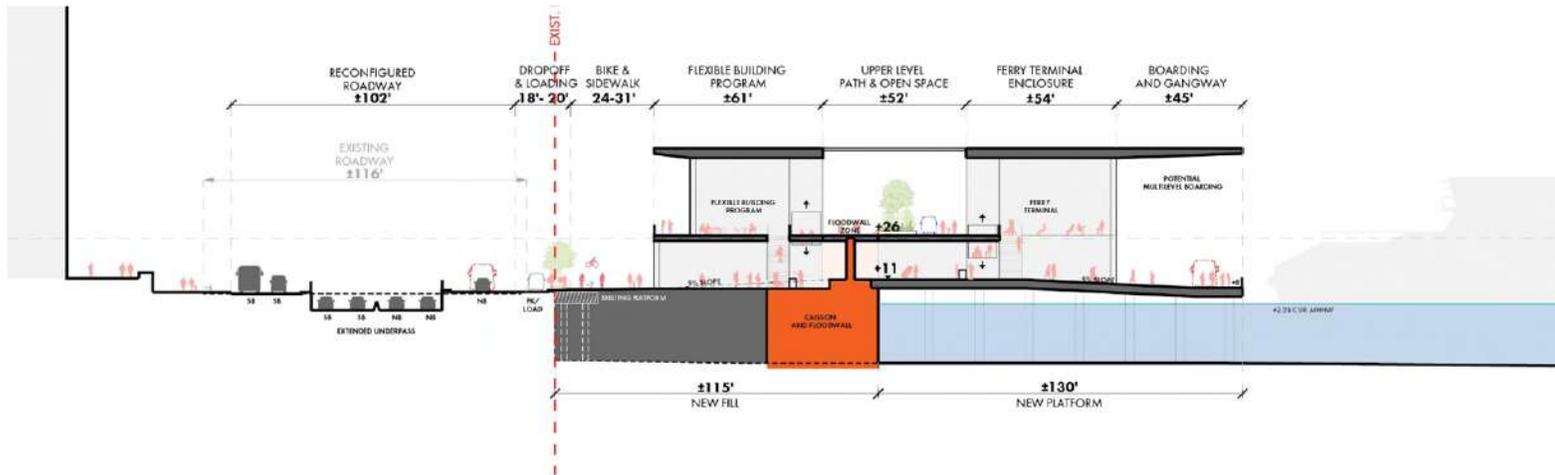
Whitehall Ferry Terminal: Full reconstruction (pathway flexible)

- A full reconstruction of WFT would allow for a flexible flood protection pathway that is integrated with the new structure.
- Allows the terminal to fully adapt to expected sea level rise conditions.
- Provides opportunity for co-location of vertical program.

Battery Maritime Building (BMB) & Ferry Terminal North of BMB



S3: Battery Maritime Building



S4: New Ferry Terminal



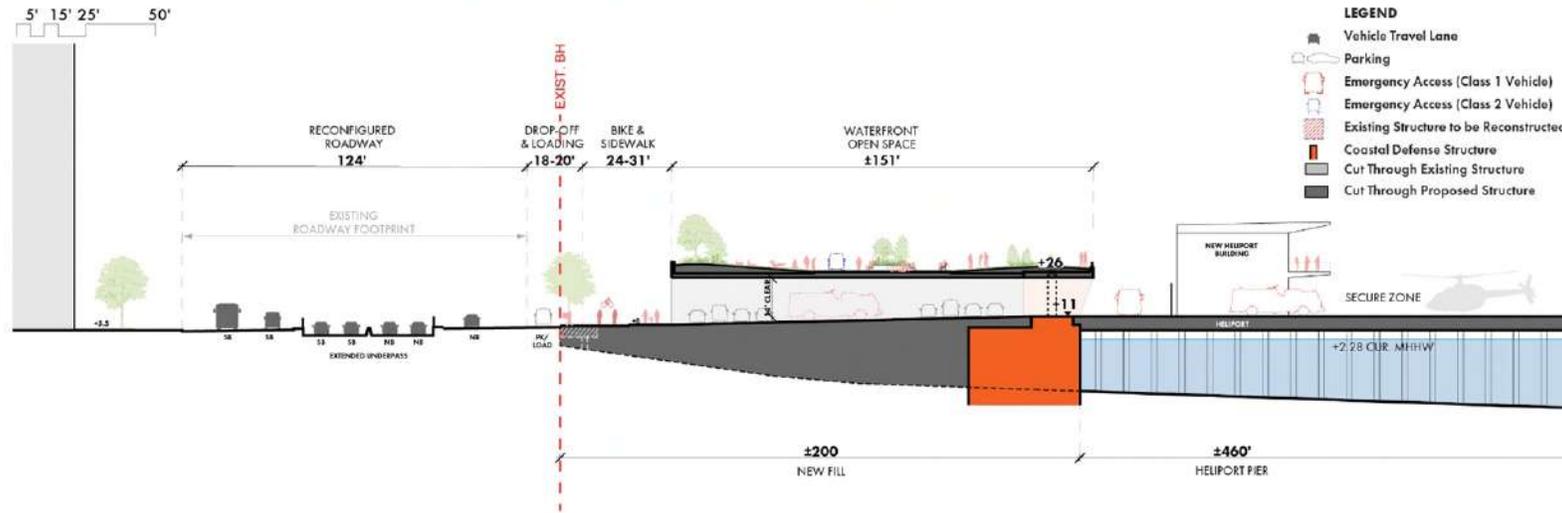
Battery Maritime Building

- Protects both facades of the historic Battery Maritime Building
- Use of the building as a ferry terminal is not preserved
- Facility can be adapted for complementary public uses such as waiting hall
- Allows subway tunnels to be crossed with shorter spans and better access
- Improves constructability

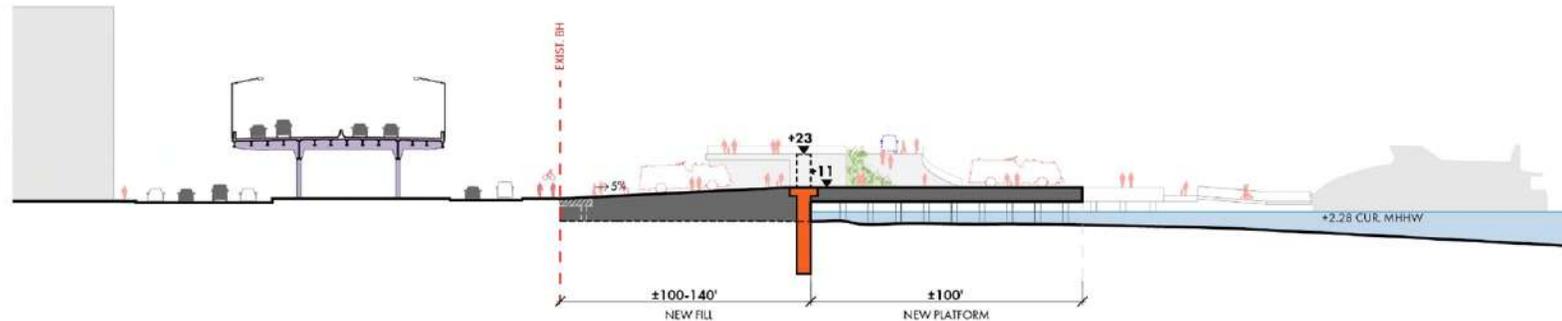
New Ferry Terminal

- Provides new location for the Governors Island Ferry and other maritime services
- A resilient gateway to the water constructed with future conditions fully considered

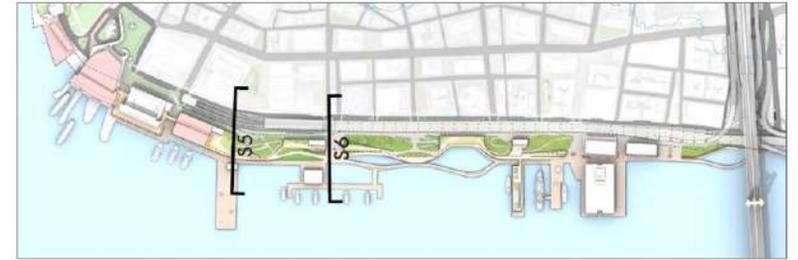
Pier 6 Downtown Manhattan Heliport & Old Slip



S5: Pier 6 Downtown Manhattan Heliport



S6: Old Slip



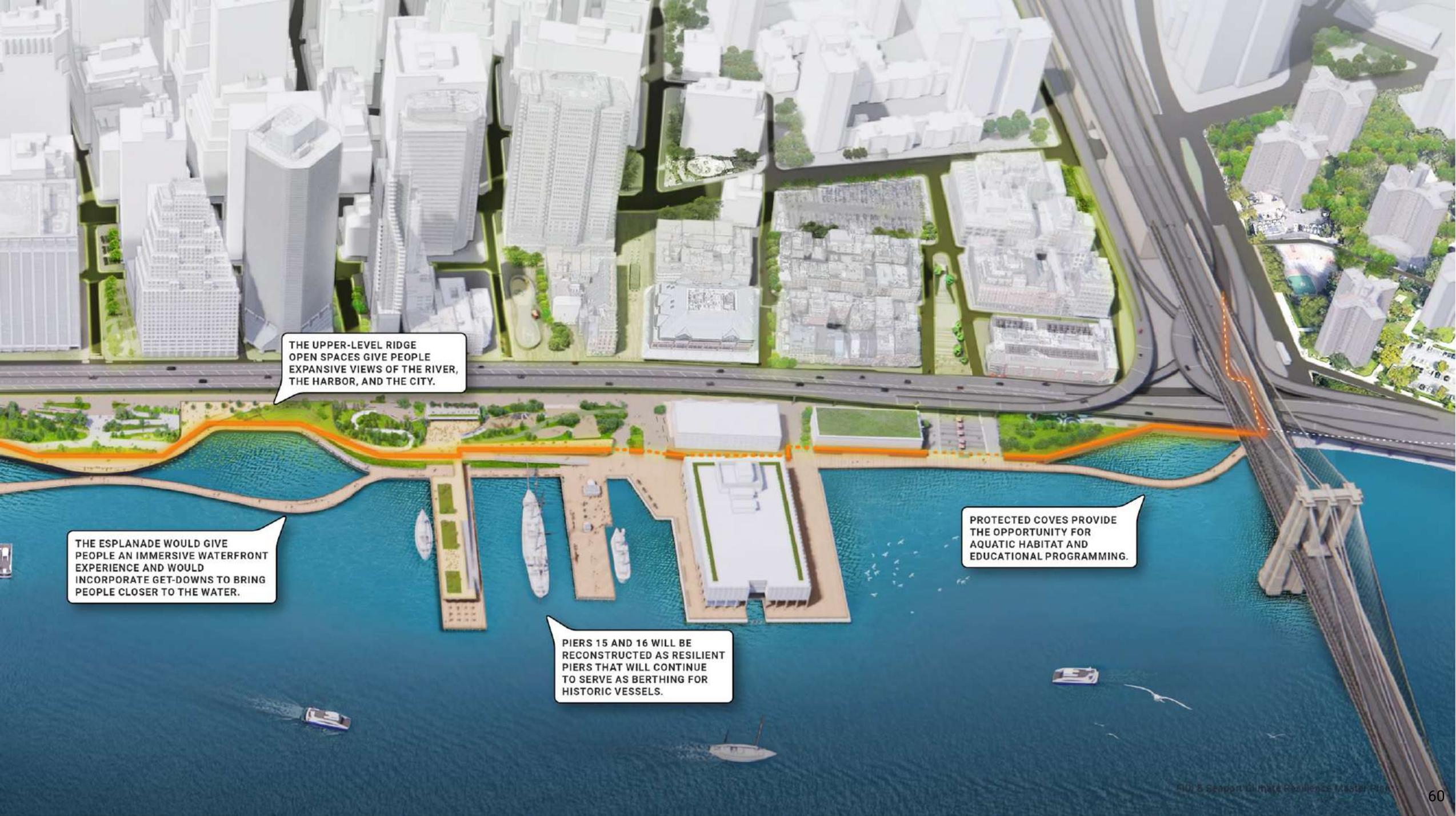
Pier 6 Downtown Manhattan Heliport

- Critically located heliport service must be maintained at this location.
- Private vehicles supporting these facilities are limited to dedicated access driveways to ensure pedestrian safety.

Old Slip

- Provides gateway to waterfront access.
- Maintains maritime and ferry services.
- Maintains access to these services for all users.
- Deployable gates maintain emergency vehicular access.

Wall Street to Brooklyn Bridge



THE UPPER-LEVEL RIDGE OPEN SPACES GIVE PEOPLE EXPANSIVE VIEWS OF THE RIVER, THE HARBOR, AND THE CITY.

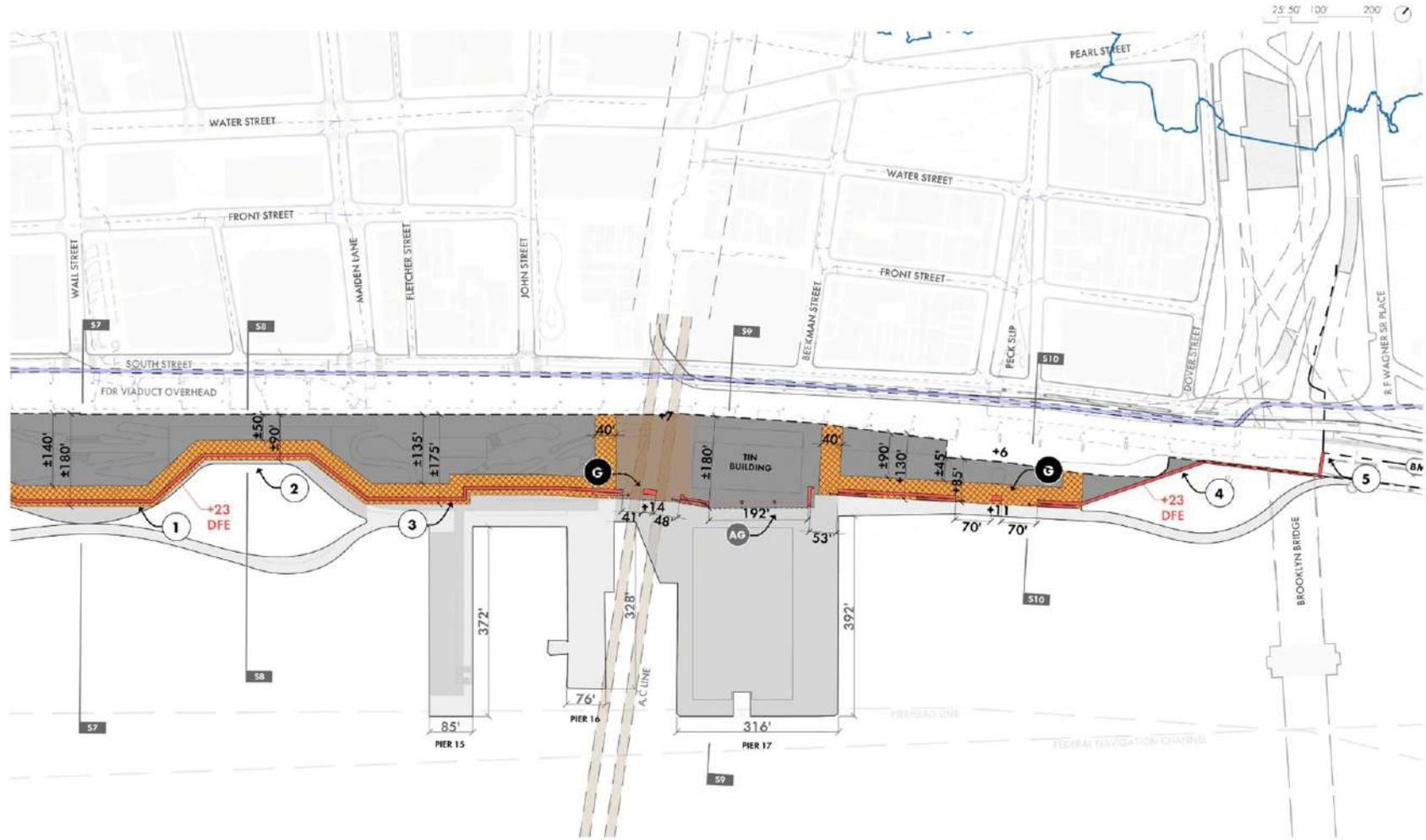
THE ESPLANADE WOULD GIVE PEOPLE AN IMMERSIVE WATERFRONT EXPERIENCE AND WOULD INCORPORATE GET-DOWNS TO BRING PEOPLE CLOSER TO THE WATER.

PIERS 15 AND 16 WILL BE RECONSTRUCTED AS RESILIENT PIERS THAT WILL CONTINUE TO SERVE AS BERTHING FOR HISTORIC VESSELS.

PROTECTED COVES PROVIDE THE OPPORTUNITY FOR AQUATIC HABITAT AND EDUCATIONAL PROGRAMMING.

Wall Street to the Brooklyn Bridge

Flood Defense & Drainage Infrastructure Plan



LEGEND

- 2100 100-Year Floodplain
- Existing Bulkhead
- Line of Flood Defense
- Integrated Flood Protection
- Floodgate
- Flip Up Gate Footprint
- New Fill
- Bridging Structure
- Caisson Structure
- Tie-Ins (For Future Study)
- BMCR/BPCA Line of Flood Defense
- Potential Pump Station Footprint
- Platform Structure At or Below +11
- Platform Structure Above +11

EXISTING SUBSURFACE INFRASTRUCTURE

- Sewer Interceptor
- Sewer Line
- CSO Outfalls
- Oil-O-Static Line
- Subway Station Footprint
- Approx. Tunnel Locations

- G Site floodgates to align with street corridors. Bridging structure spans over subways at Wall Street and Fulton Street.
- AG Additional gates on Pier 17 provide open circulation between buildings, to be studied further.
- 1 Flood defense pushes out to provide up and over access at Wall Street.
- 2 Flood defense pulls in between access points at Wall St. and Maiden Ln.
- 3 Flood defense pushes out to provide up and over access at Maiden Ln.
- 4 Flood defense pulls to existing bulkhead north of Peck Slip.
- 5 Flood defense ties into BMCR floodwall north of Dover Street. Tie-in to be studied further.

Wall Street to the Brooklyn Bridge

Illustrative Plan

LEGEND

- 2100 100-Year Floodplain
- Existing Bulkhead
- Line of Flood Defense (Buried)
- Line of Flood Defense (Exposed)
- Integrated Flood Protection
- Floodgate
- Floodgate (Below)
- Flip Up Gate Footprint
- Tie-Ins (For Future Study)
- BMCR/BPCA Line of Flood Defense

G Site floodgates to align with street corridors.
G Bridging structure spans over subways at Wall Street and Fulton Street.

AG Additional gates on Pier 17 provide open circulation between buildings, to be studied further.

f Crosswalks connecting to the city fabric.

f Site access points at Wall Street, Maiden Lane, Fulton Street, Beekman Street, and Peck Slip.

1 A detached waterfront esplanade mitigates height between levels and provides an opportunity for ecological coves.

2 Waterfront esplanade continues into Two Bridges.

3 Sloped paths connect upper level and waterfront esplanade.

4 An overlook at Wall Street provides commanding views of the waterfront.

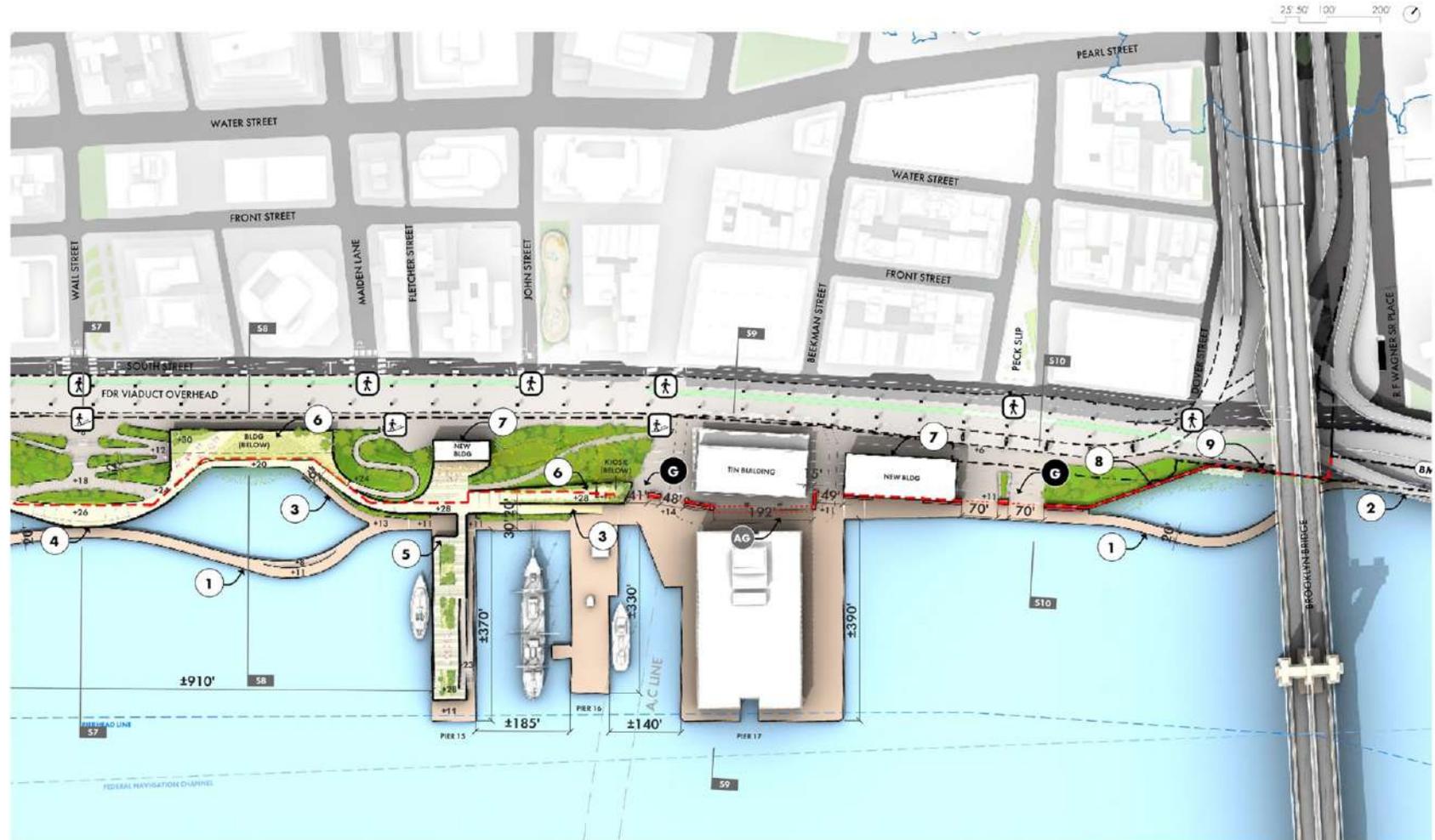
5 Bridge connects upper level of the waterfront to Pier 15.

6 Elevated public waterfront with building program below.

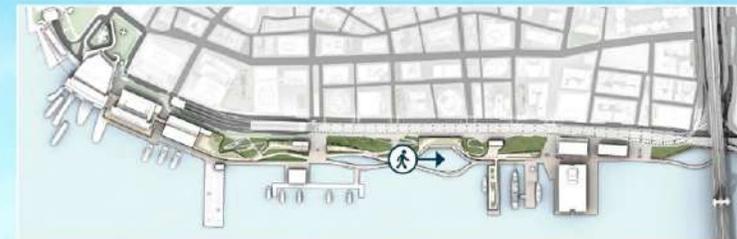
7 Flexible building sites

8 Exposed floodwall at water's edge is mitigated with upland landscape and a detached waterfront esplanade.

9 Unmitigated floodwall at water's edge.



Ecological Coves



Peck Slip - Proposal, FDR Viaduct in Place



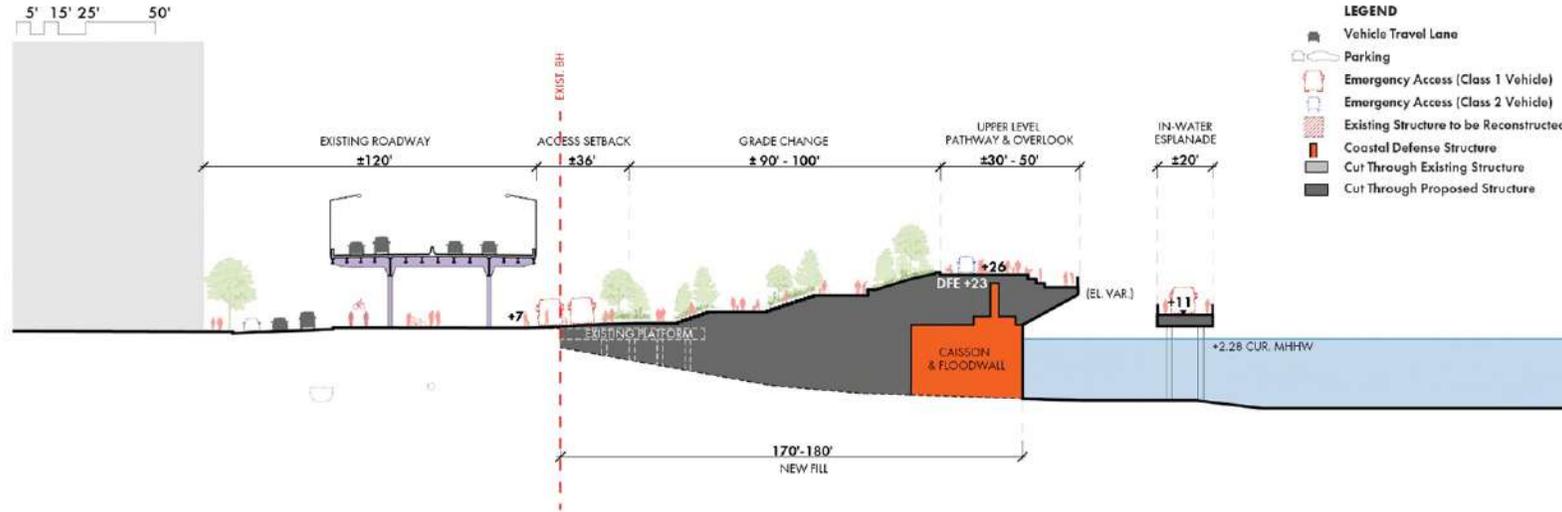
South Street Seaport, Existing Conditions



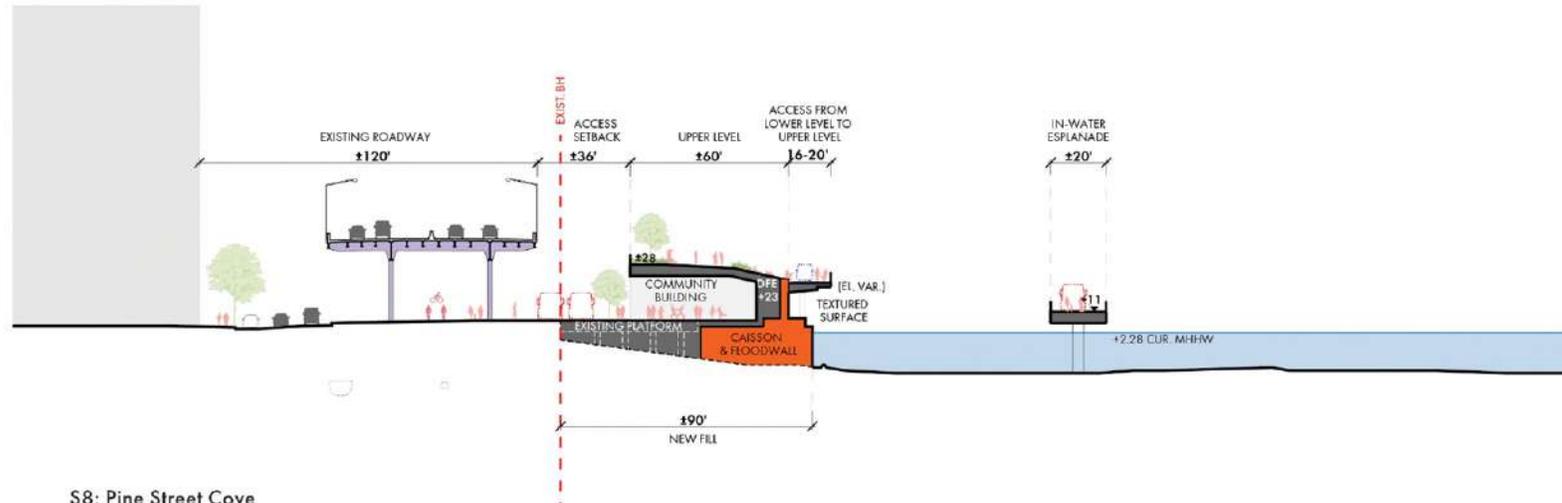
South Street Seaport, Proposed New Waterfront



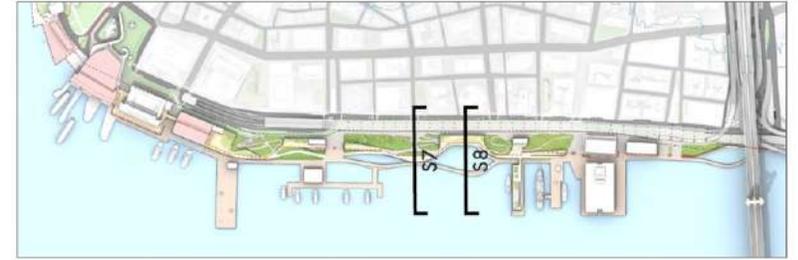
Wall Street & Pine Street Cove



S7: Wall Street



S8: Pine Street Cove



Wall Street

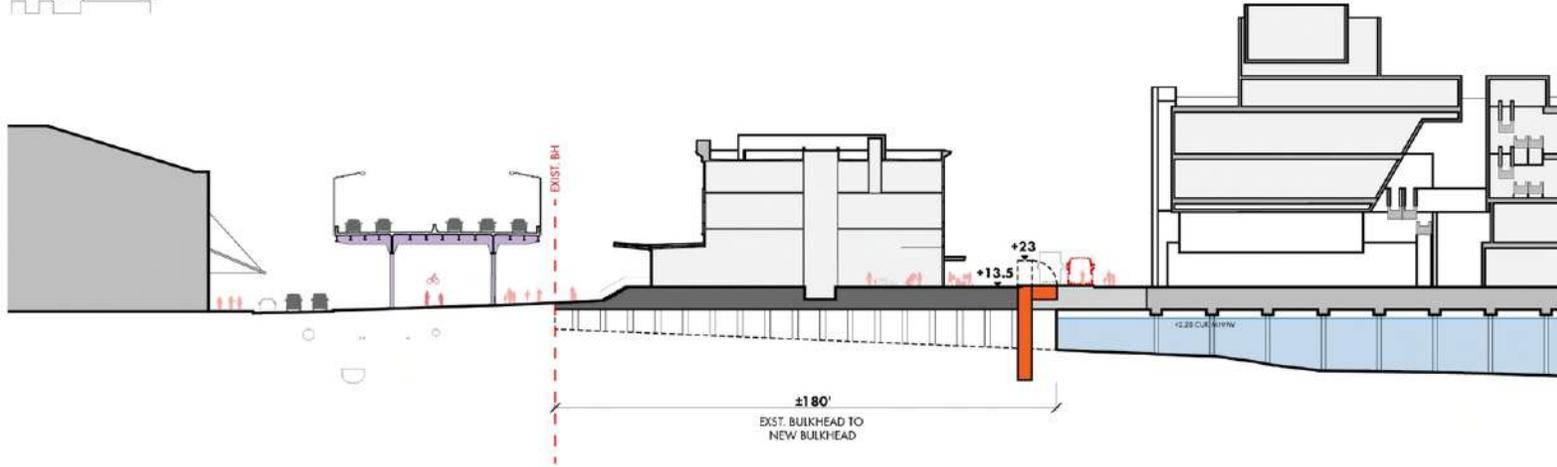
- Extension of the shoreline driven by space needed for flood defense system.
- Open space and vertical programming fits into remaining available open spaces that are a by-product of the space needed for flood protection and universal waterfront access.

Pine Street Cove

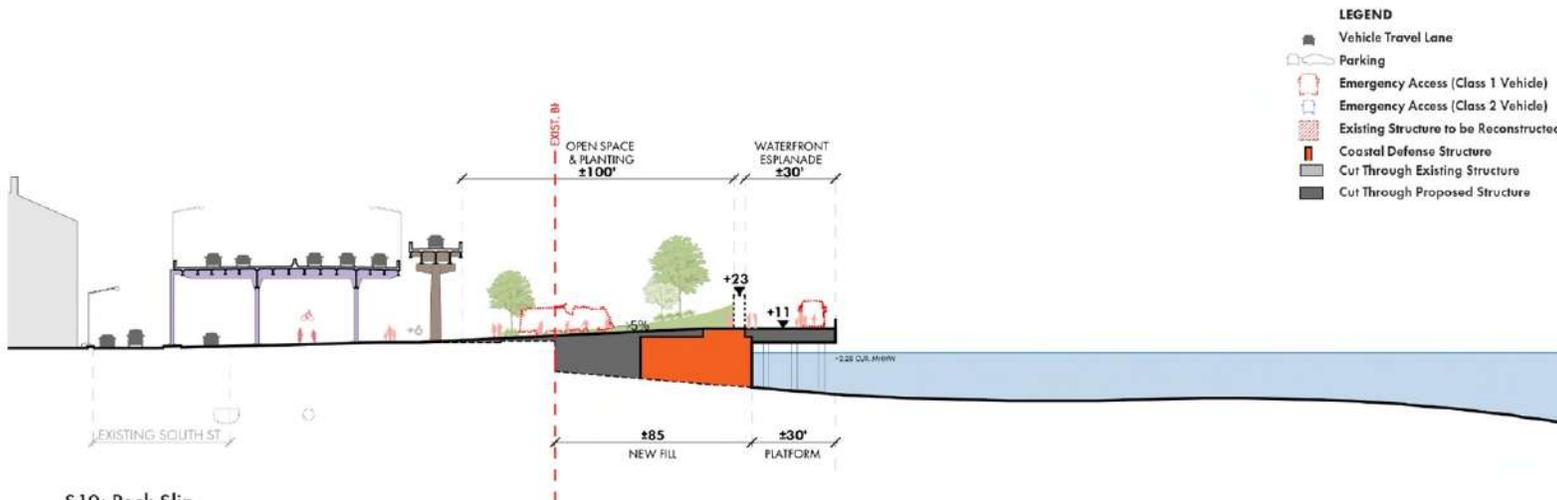
- Minimizing the shoreline extension in this area means pulling it in to the shoreline.
- The cove that is created provides an opportunity for ecological and habitat enhancements.
- Continuous waterfront access is maintained via an in-water esplanade.

Tin Building, Pier 17 & Peck Slip

5' 15' 25' 50'



S9: Tin Building & Pier 17



S10: Peck Slip



Tin Building & Pier 17

- Protects the Tin Building without disrupting internal operations.
- A passive system with deployable gates to maintain emergency vehicular access.
- Private vehicles supporting these facilities are limited to dedicated access driveways to ensure pedestrian safety.

Peck Slip

- Achieves the passive design flood elevation while maintaining universal access to the waterfront with minimum shoreline extension.
- North of Peck Slip, the flood defense alignment tapers back to shore, minimizing potential impacts to intertidal habitat and hydrodynamic impacts (e.g., increased water speeds / scour) to the Brooklyn Bridge footings.

Recommended Next Steps for Technical Study and Design of the Master Plan

- **Further study of both the northern and southern tie-in.**
While a recommended alignment was identified as part of the master plan, further technical and urban design study is needed to ensure technical feasibility and integration into Lower Manhattan.
- **Further study on maritime assets and long-term functionality.**
While the master plan establishes a framework for maritime adaptability and long-term planning, a separate study that considers the long-term needs and facilities is recommended. This includes an asset-by-asset feasibility study for: USCG Site, Whitehall Ferry Terminal, Battery Maritime Building, the Pier 6 Downtown Manhattan Heliport, the new Pier 11 ferry terminal at Old Slip, and a potential new ferry terminal.
- **BMB Feasibility Assessment.**
While the master plan recommends an outboard alignment for the BMB and relocating the ferry services directly adjacent at a new facility, additional technical study is needed to test and understand the feasibility of flood defense outboard of the site. Given the complex subsurface conditions (e.g., numerous subway tunnels), the building's existing pile support structures, and the historic nature of the asset, a separate study is recommended to understand the proposed flood defense alignment for the building.
- **Pump Station Feasibility Study.**
Additional study is recommended to compare the potential locations for a new pump station, including constructability, technical feasibility, costs, and integration with other elements of the master plan.
- **Advancing design in support of permit applications.**
Additional engineering and design is needed to advance the conceptual design of the master plan towards preliminary design to start the environmental review. This includes field work, civil, structural, and geotechnical considerations, as well as additional hydrodynamic modeling.
- **FDR Drive Feasibility Study.**
While not critical path for the advancement of the master plan, based on the community's feedback to study the feasibility of transforming the existing viaduct into an at grade boulevard, additional analysis could be conducted to understand the structural feasibility of taking down the FDR Drive viaduct.
- **Continued Funding and Financing Study.**
As project planning and design advance, the City will continue to monitor and explore new funding sources and further develop the overall funding strategy. The federal government is a potential major source of funding for the master plan and the City will continue to pursue all avenues to federal funding.