

FINANCIAL DISTRICT COASTAL IMPROVEMENT PROGRAM

A RESILIENT FUTURE FOR
LOWER MANHATTAN

CONTENTS

1 INTRODUCTION

2 PROTECT

3 CONNECT

4 RENEW

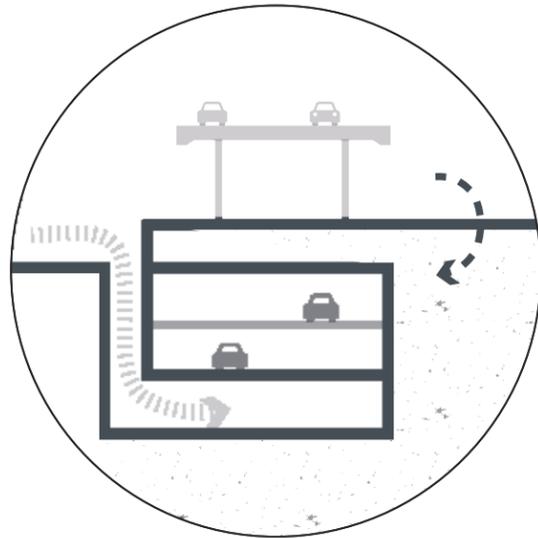
The Financial District Coastal Improvement Program (“FDCIP”) is a multifaceted waterfront improvement initiative that is facilitated by moving the elevated section of the FDR Drive underground. The tunnel will be dual-purpose, both eliminating surface level traffic and pollution while acting as a flood mitigation structure.

These improvements have the potential to create a vibrant, accessible, open waterfront and increase real estate value from Battery Park to Corlears Hook.

1 INTRODUCTION

HOW CAN WE CREATE A RESILIENT FUTURE FOR LOWER MANHATTAN?

Tunnelling the FDR will transform the waterfront of Lower Manhattan by protecting it from future flooding and enable communities to become resilient to the changing environment.

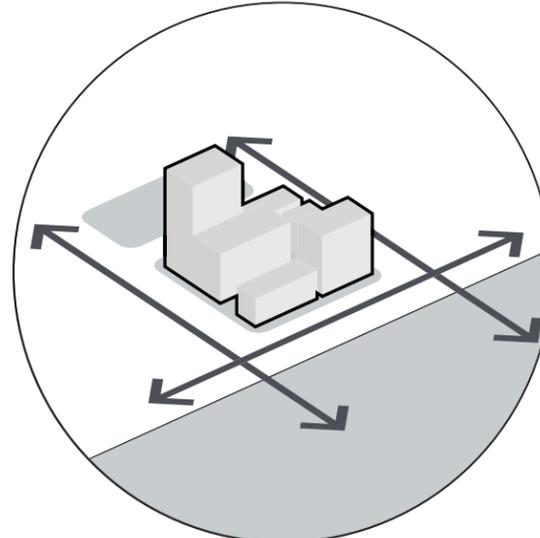


PROTECT

Flood mitigation by moving the FDR underground

Rising sea levels and increased frequency of storms will result in extensive flooding and other environmental hazards. Lower Manhattan needs a robust plan to protect the region from these threats and provide infrastructure that will endure the changes.

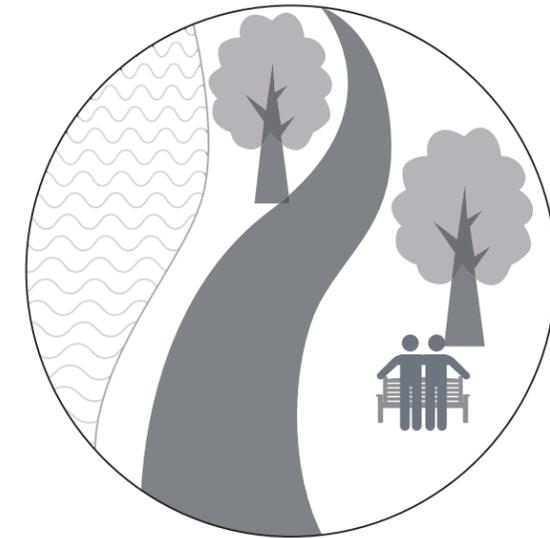
A new tunnel will act as flood mitigation during times of need and protect the coastline from rising water levels.



CONNECT

Alleviate traffic and connect the neighborhoods with the waterfront

By moving the FDR underground and removing the elevated highway, the waterfront will become more accessible and enjoyable for the public. Traffic improvements at key locations such as the Brooklyn Bridge and Pier 36 will allow for less congestion. In addition, air quality will improve due to fewer cars above ground.



RENEW

Activate the coastline and lay a framework for a resilient community

New connections to the waterfront will give the surrounding communities much needed public space. Additional developable land and mixed ground floor uses will activate the area, therefore bringing new visitors and residents to the surrounding neighborhood.

ENVIRONMENTAL URGENCY

Mitigating the impacts of climate change has become an urgent issue for the city of New York. Hurricane Sandy revealed how vulnerable Lower Manhattan was to storm surges and it was only a preview of what the city will face in the future.

Because Lower Manhattan is an economic, cultural and civic hub, the impacts of climate change will extend far beyond the district and has the potential to deeply damage economic output for the city in ways it cannot predict. Tourists, workers and local residents would all be greatly affected with another storm surge event such as Sandy, and its historic identity could be deeply damaged for future generations.

The recently released Lower Manhattan Climate Resiliency Study (2019) indicates that by the 2050's, a 100-year storm surge could put 37% of the properties in Lower Manhattan at risk of damage, with a combined assessed value of \$13 billion. By 2100, that number could increase to 50% of the properties with \$14 billion in damages. In addition, with just a 10-year rain event, the sewer system may be at risk of overflowing and backing up into buildings.

-  Hurricane Sandy inundation
-  2050 100-year floodplain
-  2050 500-year floodplain



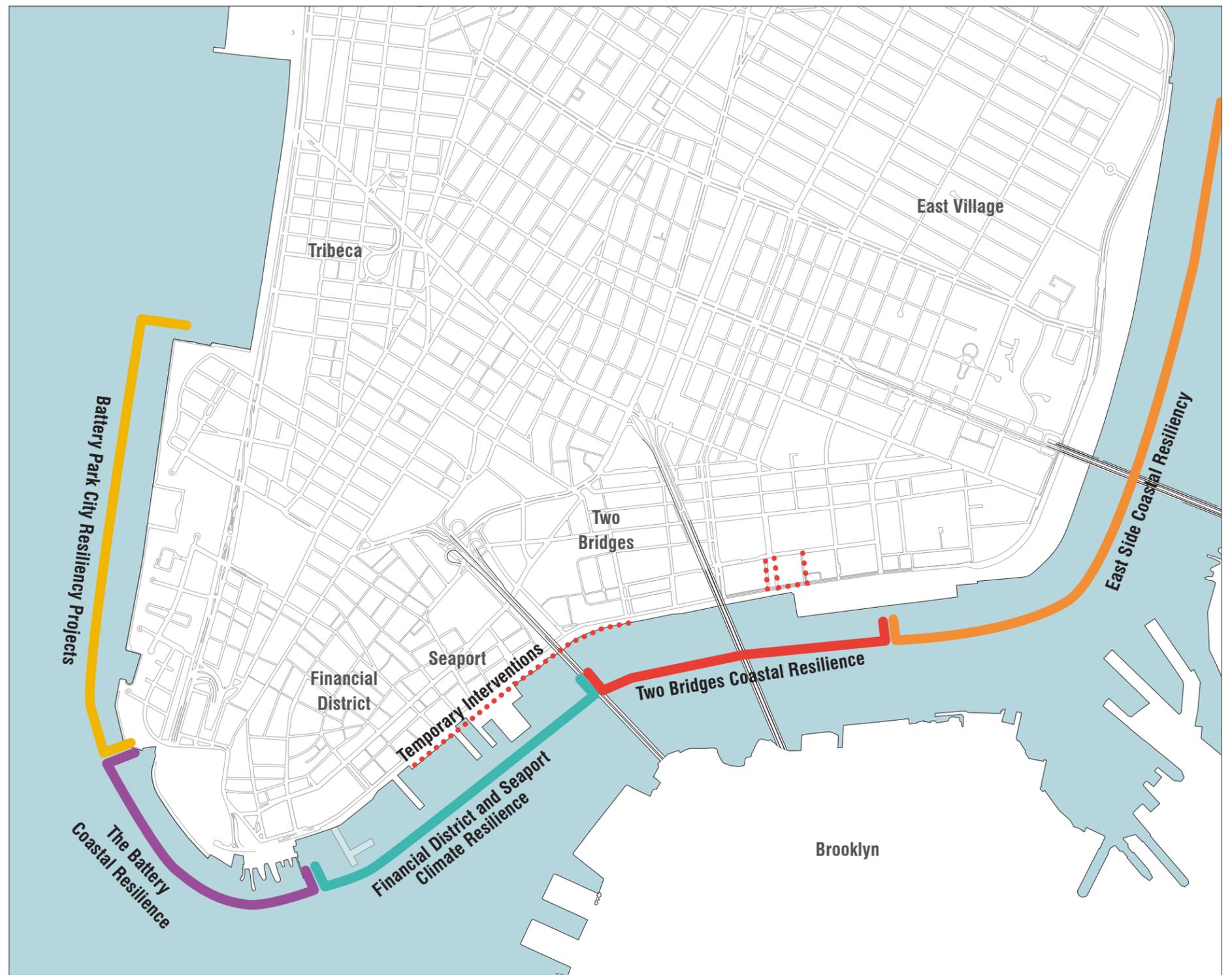
CONTEXT & FUNDING

This project seeks to respond to the environmental urgency of flood mitigation by utilizing the Federal, State and City funding sources specifically allocated to resilience strategies for Lower Manhattan. Secured Funding Sources include Community Development Block Grant – Disaster Recovery Program (CDGB-DR) and City Capital.

Existing Context

New York City's resilience strategy includes four existing capital projects, the recently released Financial District and Seaport Climate Resilience Master Plan, and the East Side Coastal Resiliency Strategy. This project aims to compliment and strengthen these existing initiatives.

- **Temporary Interventions** - In the South Street Seaport area, parts of the Financial District and Two Bridges neighborhoods, Emergency Management (EM) will spend \$3.5 million to deploy a combination of just-in time Tiger Dams and pre-deployed HESCO barriers by the 2019 hurricane season as temporary measures in advance of a permanent solution.
- **Battery Park City** - The Battery Park City Authority (BPCA), using \$134 million in bonds authorized by the City, will develop coastal protection projects to adapt to new climate conditions. BPCA kicked off design in 2018 and will start construction in 2020.
- **The Battery** - NYCEDC, in partnership with NYC Parks, BPCA and the Battery Conservancy, will invest \$165 million in the Battery to elevate the wharf and esplanade and integrate a protective barrier such as a berm at the back of the park. Construction will begin in 2021.
- **Two Bridges** - NYCEDC is designing an integrated flood protection system for the Two Bridges neighborhood. DDC will manage construction of the \$200 million investment, which will begin in 2021.
- **The Financial District and Seaport Climate Resilience Masterplan** - The NYEDC and ORR are workign to develop a masterplan that responds to th especific needs of this area. Project is in conceptual phase at the moment.
- **East Side Coastal Resiliency** - The City, headed by the DDC, was awarded \$335 million to evaluate and develop integrated coastal protection for the 2.4 mile stretch. It is currently undergoing public consultation.



EXISTING CONDITIONS

The Viaduct

FDR Drive is a parkway on the east side of Manhattan that spans four to six lanes wide in most locations. The viaduct in Lower Manhattan creates an unpleasant pedestrian environment at the ground level and a creates a strong barrier between waterfront and surrounding neighborhoods. In addition, it creates noise and air pollution.

Shadowed by the elevated road, the historic Seaport District has begun to bridge the neighborhood through activation of the South Street Seaport pier; however, that connection could be vastly improved without the viaduct.

Brooklyn Bridge

The Brooklyn Bridge interchange is a complicated series of ramps and roads that cause backups on the FDR in both directions and create delays on Pearl Street during peak hours due to poor intersection design. The FDCIP streamlines the traffic flow and makes the area more navigable for drivers.

Broad Street/Battery Park Underpass

The Governors Island Ferry is currently served by a narrow sidewalk that frequently overflows onto South Street creating an unsafe condition for pedestrians. In addition, Pier 11 and the Heliport are also constrained by the current placement of the parkway, making it hazardous for passenger pickup and dropoff. Improved traffic conditions will allow these areas to be more pedestrian friendly.

Lower East Side and Two Bridges Neighborhoods

Disconnected from the city geographically, socially and through public transportation, these neighborhoods have historically been neglected. Hurricane Sandy exposed the vulnerability of these neighborhoods, to which the city has responded with a series of small scale interventions. Lowering the FDR underground can only help these communities gain access to public space, and also aid in the mitigation of damages from future storms as sea levels rise.



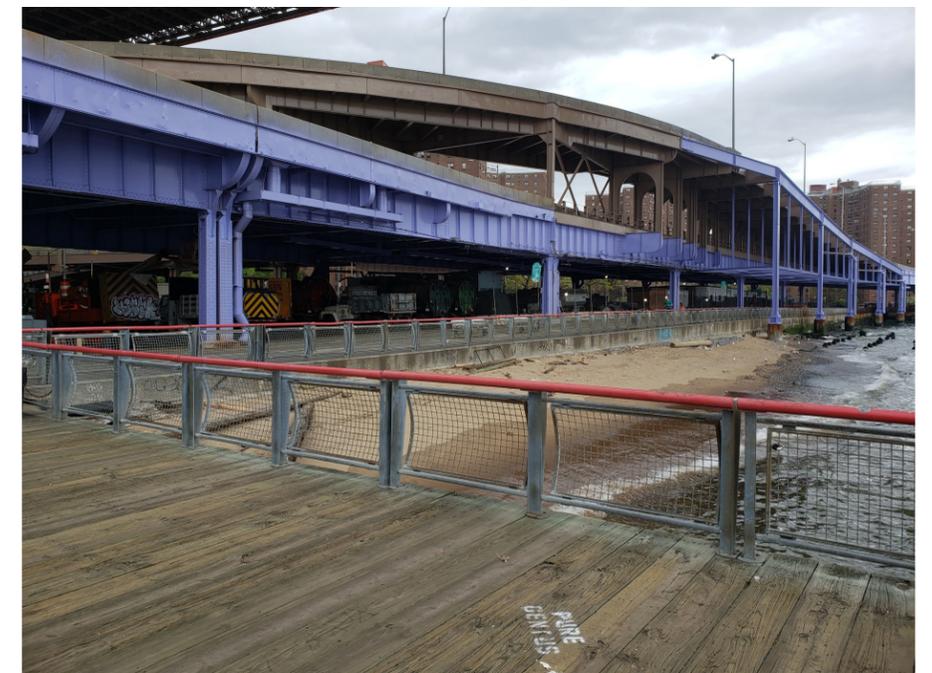
View to the south from the Manhattan Bridge illustrating the disconnect of the waterfront from the neighborhood



The experience of the waterfront is deeply hindered by the overhead viaduct.



The viaduct hinders the connection between the Historic Seaport district and the water.

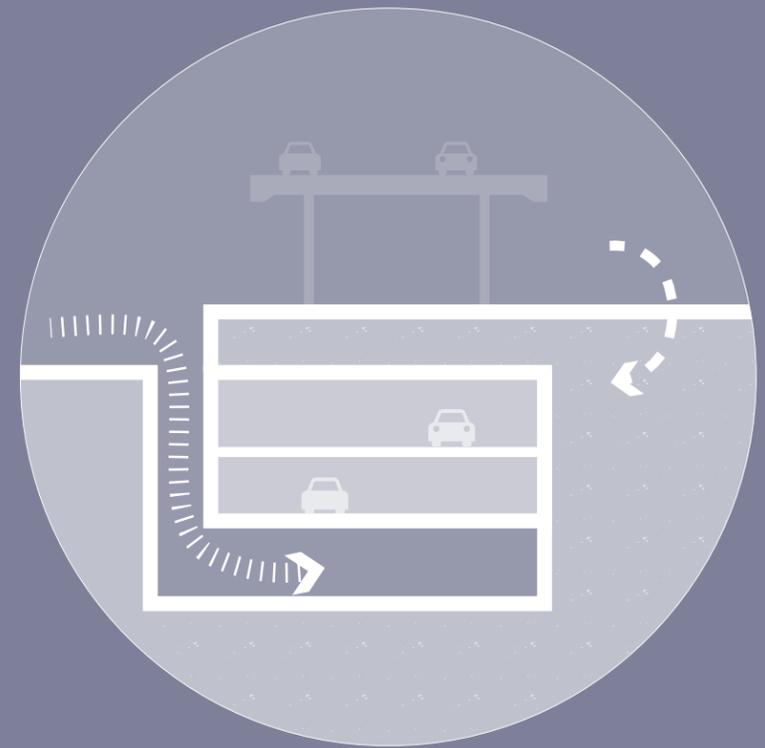


The Brooklyn Bridge interchange is a complicated system of ramps and streets.

2

PROTECT

Flood mitigation by moving
the FDR underground



COASTAL PROTECTION

In addition to the tunnel, there will be two different conditions that vary by location. South of the Brooklyn Bridge there will be a seagate- a hydraulically lifted wall that would elevate in extreme weather. North of the Brooklyn Bridge would have a coastal extension, as indicated in the diagram below.

The Tunnel

The tunnel is intended to operate in three modes- typical day-to-day, heavy rains, and storm surges. Daily functions allow traffic to flow two ways. During heavy rains, the tunnel will dually function as an overflow retention tank as well as for traffic. During a storm surge, the tunnel will be closed to traffic and it will act as a retention tank for sea water. In addition to the emergency overflow in major storm surge, the tunnel can act as a storm and sewer retention tank to store overflow in times of heavy rain until the water treatment facilities can handle the increased load, as opposed to the current practice which is to push the untreated sewage out to the river. The relocation of this portion of the highway underground also gives the opportunity to redesign it to current safety standards as well as improve traffic flow on and off the Brooklyn Bridge, which is often in gridlock.

Removing the viaduct and the opening up the waterfront will result in a significant reduction of traffic flow at grade. This will be a huge benefit to businesses and residents along the South Street frontage. The tunnel will unlock the true value of many of the adjacent sites and will be the catalyst for sustainable regeneration.

Seagate- Hydraulic Wall

The Seagate would occur south of the Brooklyn Bridge in the Harbor District and the Seaport Historic District. The hydraulically lifted wall would elevate when extreme weather is expected. As sea levels rise, water from the river will fill a reaction chamber that signals a hydraulic piston system to raise the promenade platform at the river's edge into a vertical wall blocking storm surge waves from reaching the areas of Lower Manhattan west of South Street. This will drive water into the tunnel retention tank as well as deflecting it back to the river.

Coastal Extension

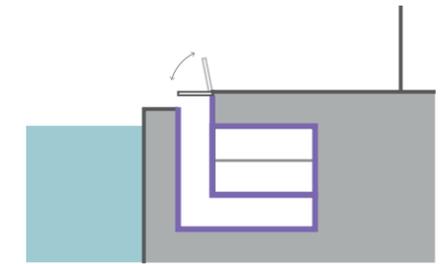
The coastal extension will occur northeast of the Brooklyn Bridge and join Pier 36. It will be elevated above the current coastline and allow for flood waters to flow underneath into the tunnel when necessary.

Coastal Protection Locations

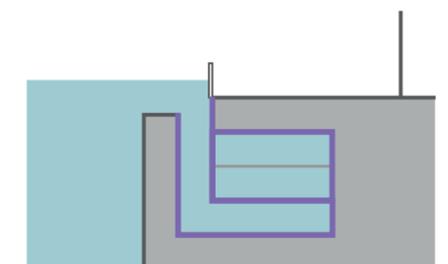


- Seagate- hydraulic wall
- Coastal extension
- Existing extension/Pier 36
- FDR Tunnel

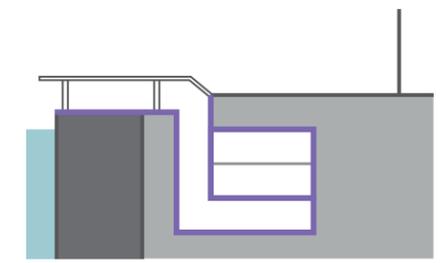
Seagate- Typical Conditions



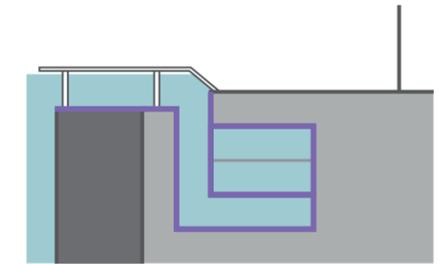
Seagate- Flooded Conditions



Coastal Extension Typical Conditions

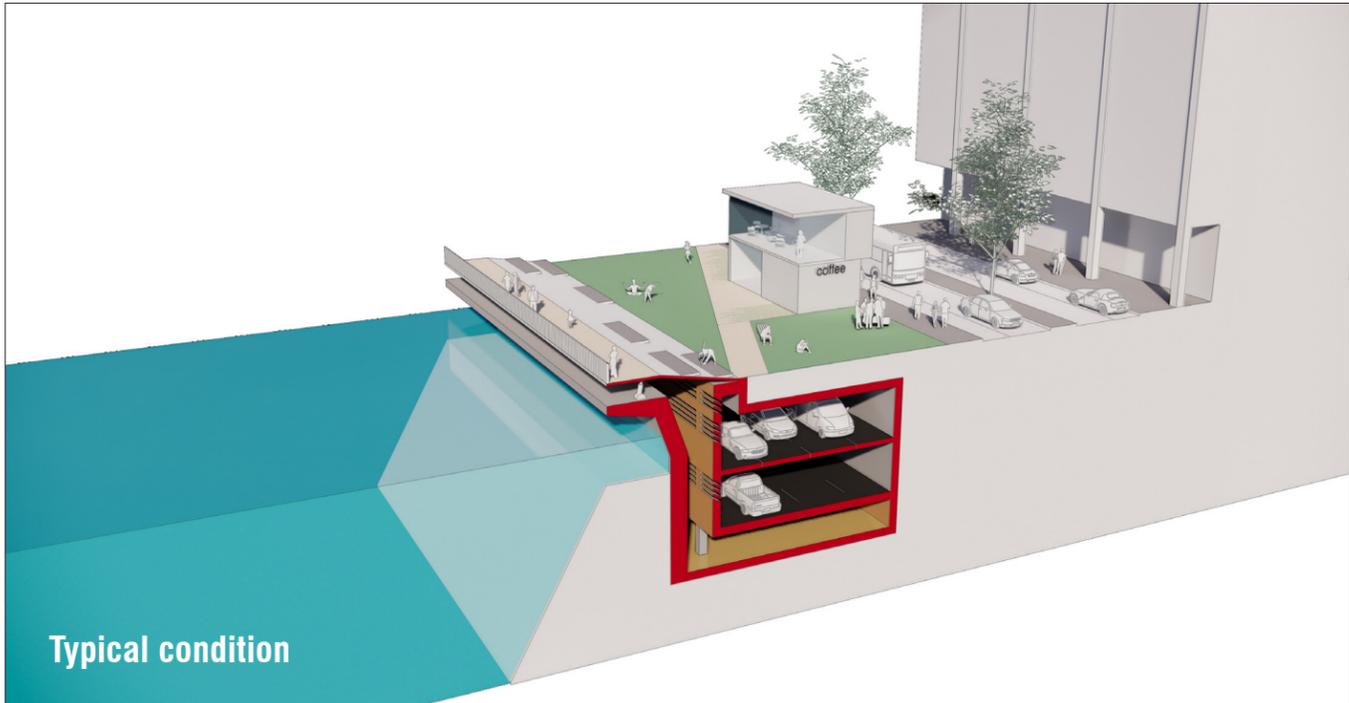


Coastal Extension Flooded Conditions

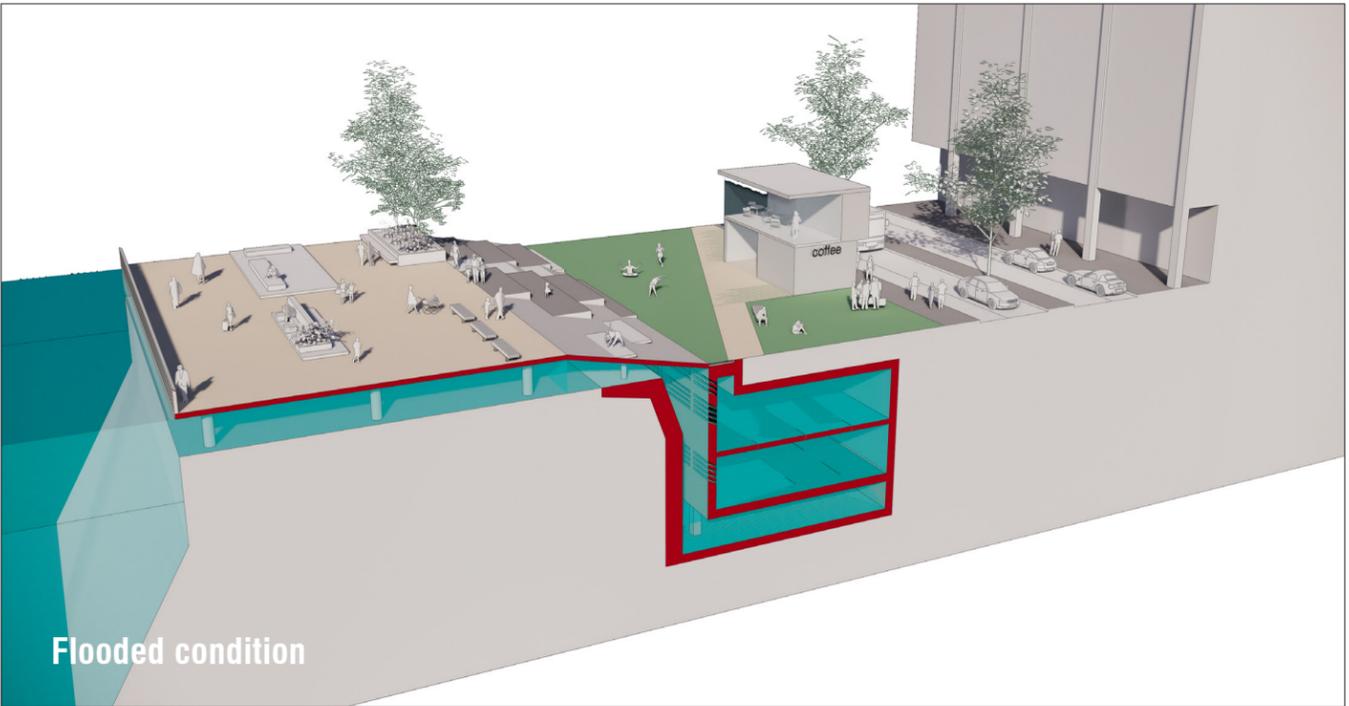
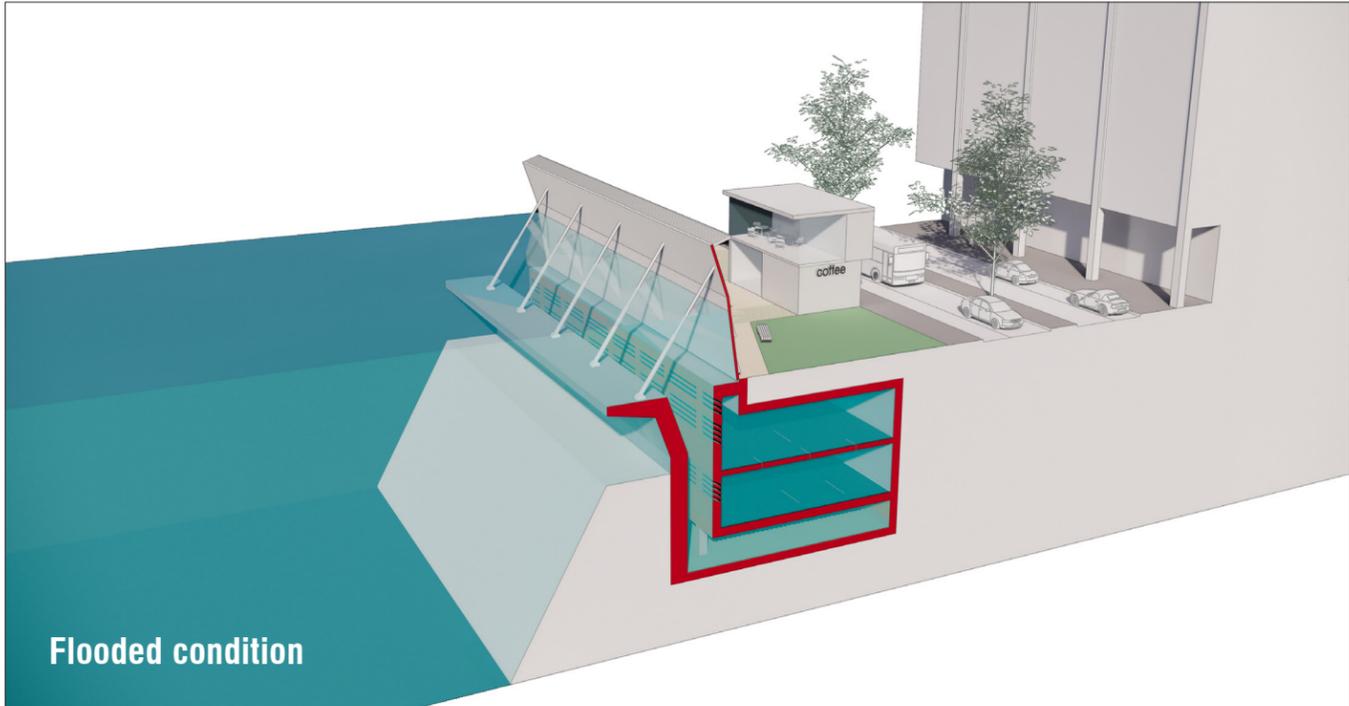


COASTAL PROTECTION CONDITIONS

SEAGATE- RAISED HYDRAULIC WALL



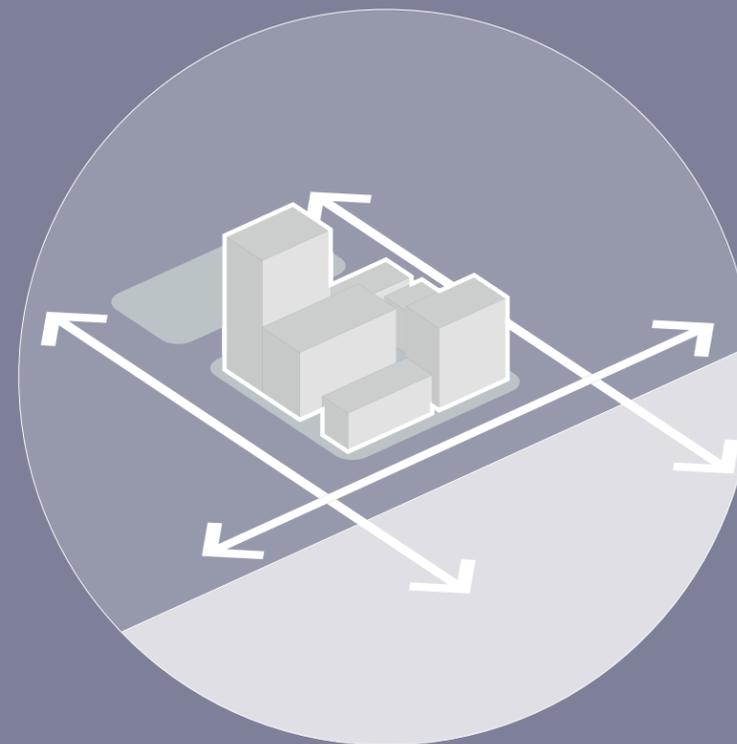
COASTAL EXTENSION



3

CONNECT

Alleviate traffic and connect the neighborhoods with the waterfront



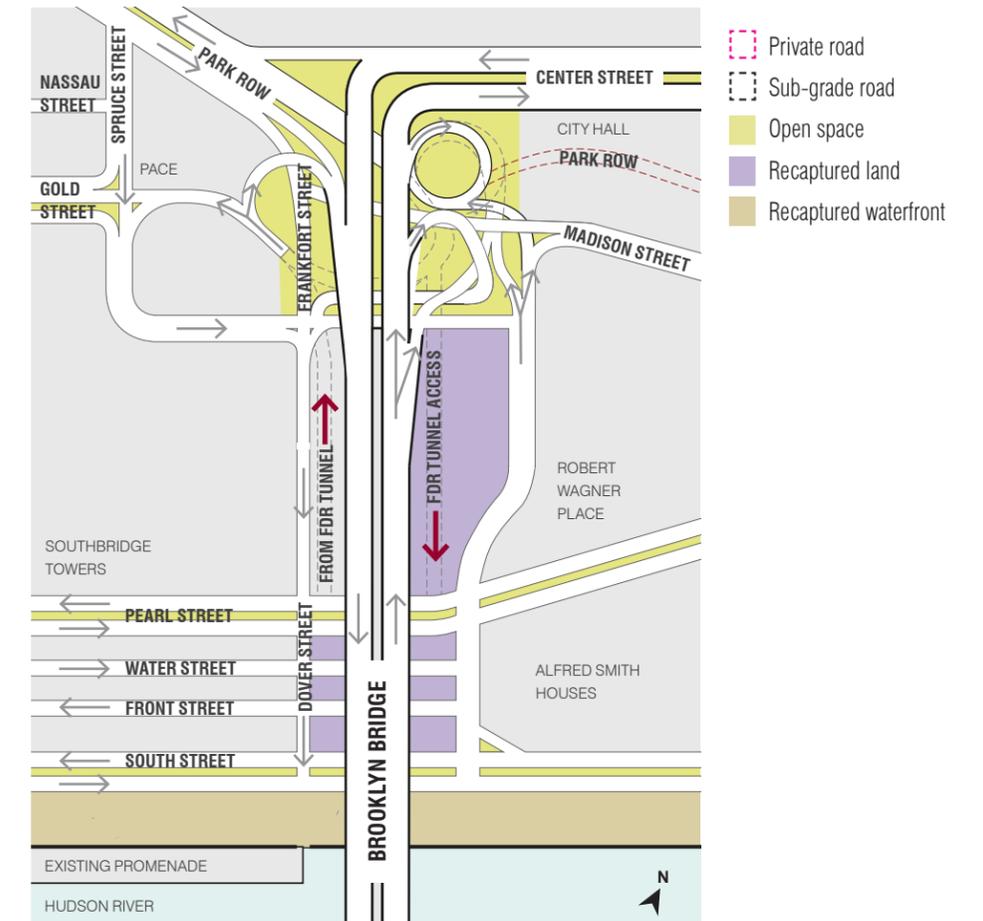
BROOKLYN BRIDGE

- The Brooklyn Bridge ramps cause backups on the FDR in both directions. It also creates delays on Pearl Street during peak hours due to poor intersection design.
- Separate the Bridge access ramps from the FDR earlier in their new subgrade location which will lessen the impact of Brooklyn Bridge traffic on other areas. Additional access to the FDR in both directions from the Bridge will be provided from the abandoned Park Row North Ramp.
- Reopen Spruce Streets between Gold and Frankfort Streets to eastbound traffic and reopen Robert Wagner Place between Pearl Street and Madison Street to all traffic westbound. This will create a new connection to Park Row Southbound, new access to the FDR in both directions, and to the Brooklyn Bridge from the surrounding local streets.

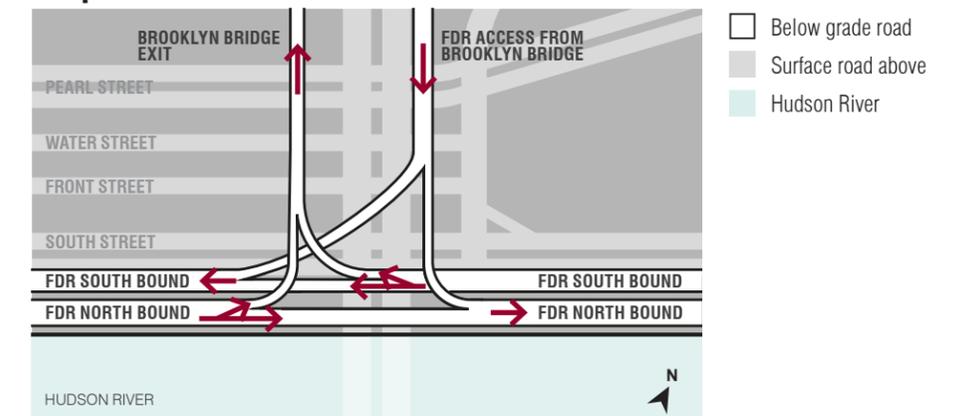


View of the existing interchange at the Manhattan side entrance to the Brooklyn Bridge

Proposed Surface Roads



Proposed Below Grade Roads

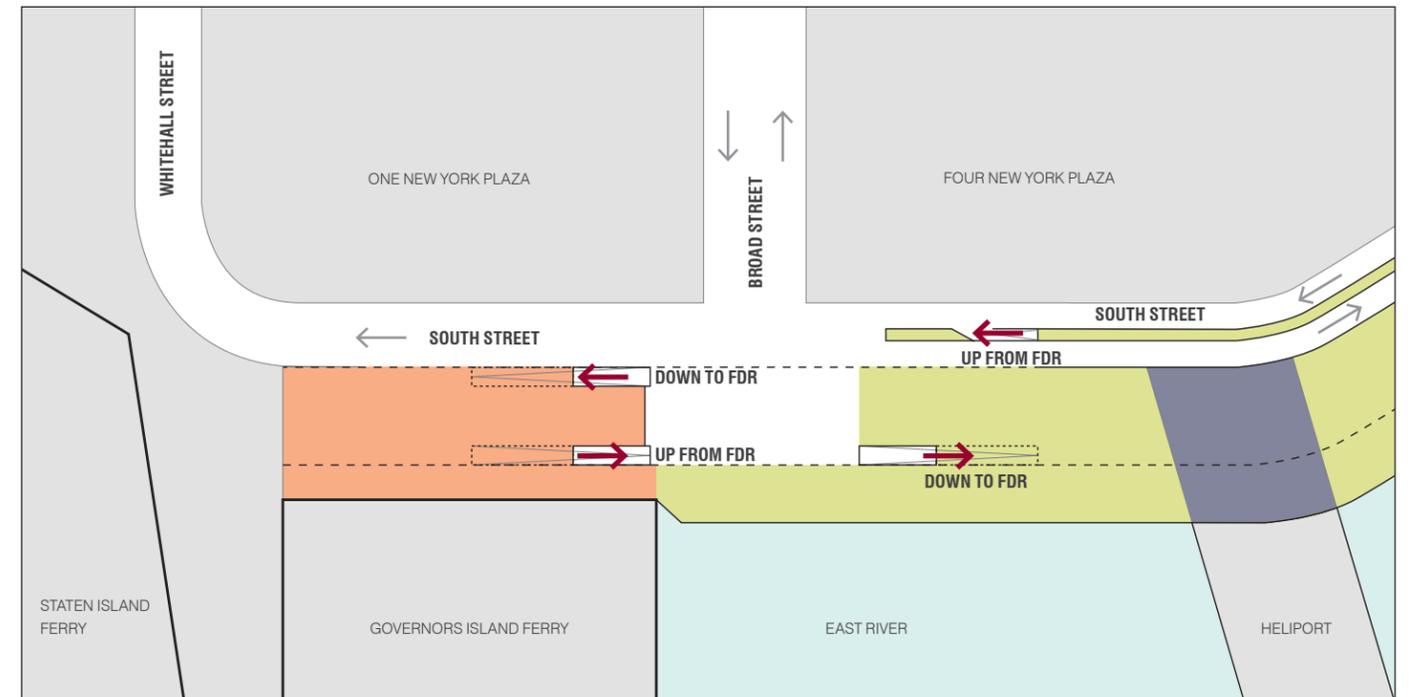


BROAD STREET/ BATTERY PARK UNDERPASS

- The Governors Island Ferry is currently served by a narrow sidewalk that frequently overflows onto South Street creating unsafe conditions for pedestrians. The new tunnel will allow South Street to be moved back off the water and create a proper passenger queue area.
- Pier 11 and the Heliport are also constrained by the current placement of the highway. Passenger drop offs happen in the middle of a one lane road or an on ramp to the FDR. The proposed tunnel and South Street relocation will create space for a proper drop off and pick up area.
- Exit One in both directions currently creates a dangerous cross traffic pattern intersection between the FDR and South Street. The new Exit One ramps will originate and terminate at a new intersection between Broad Street and South Street creating a new, organized traffic pattern.



- New Plaza for Governor's Island Ferry
- Promenade Space or Median
- New Heliport access and drop off

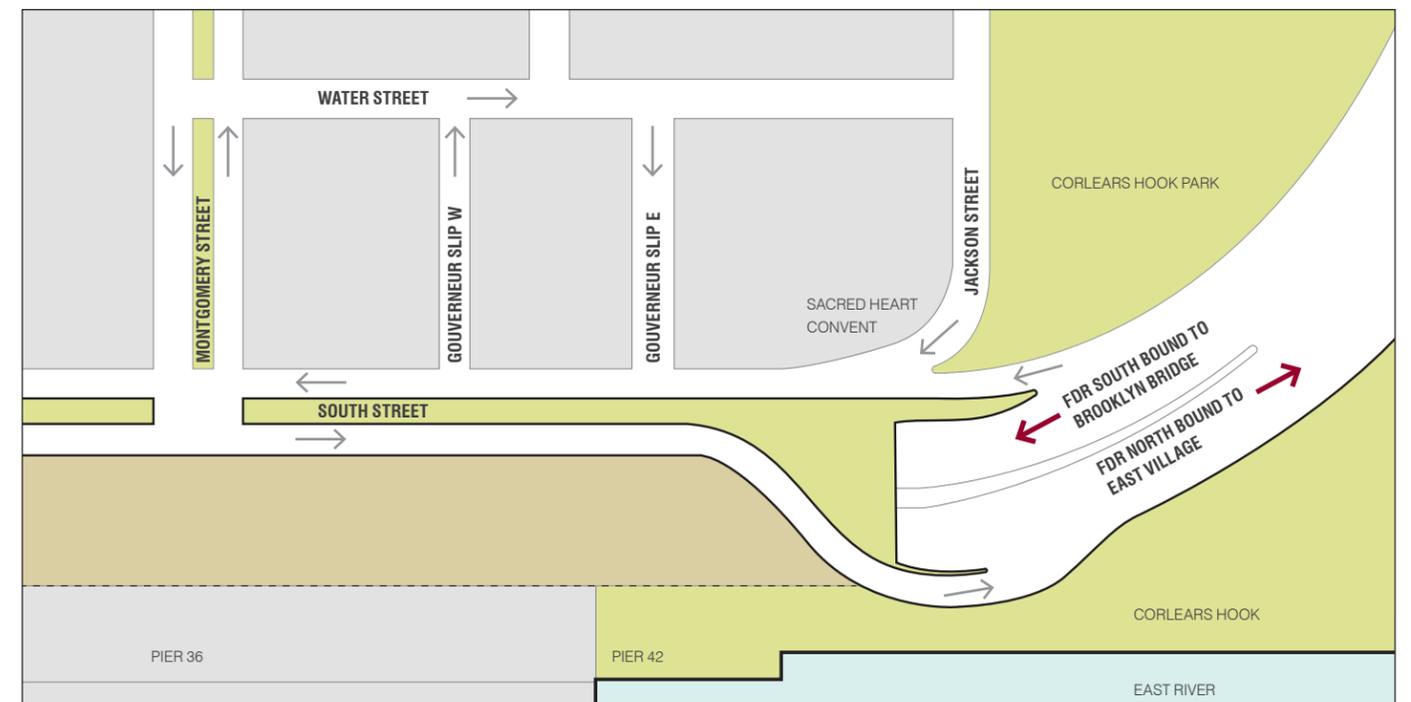


PIER 36- CORLEAR'S HOOK

- Pier 36 is a key point in the transport network of the area and becomes the terminus of the underground FDR tunnel.
- The space where the elevated road used to be will now be reclaimed public space that connects to the greater waterfront network of public spaces.
- New perpendicular street connections are added along South Street, therefore making the vehicle transit more permeable.



- Parks or Median
- Reclaimed Promenade Space



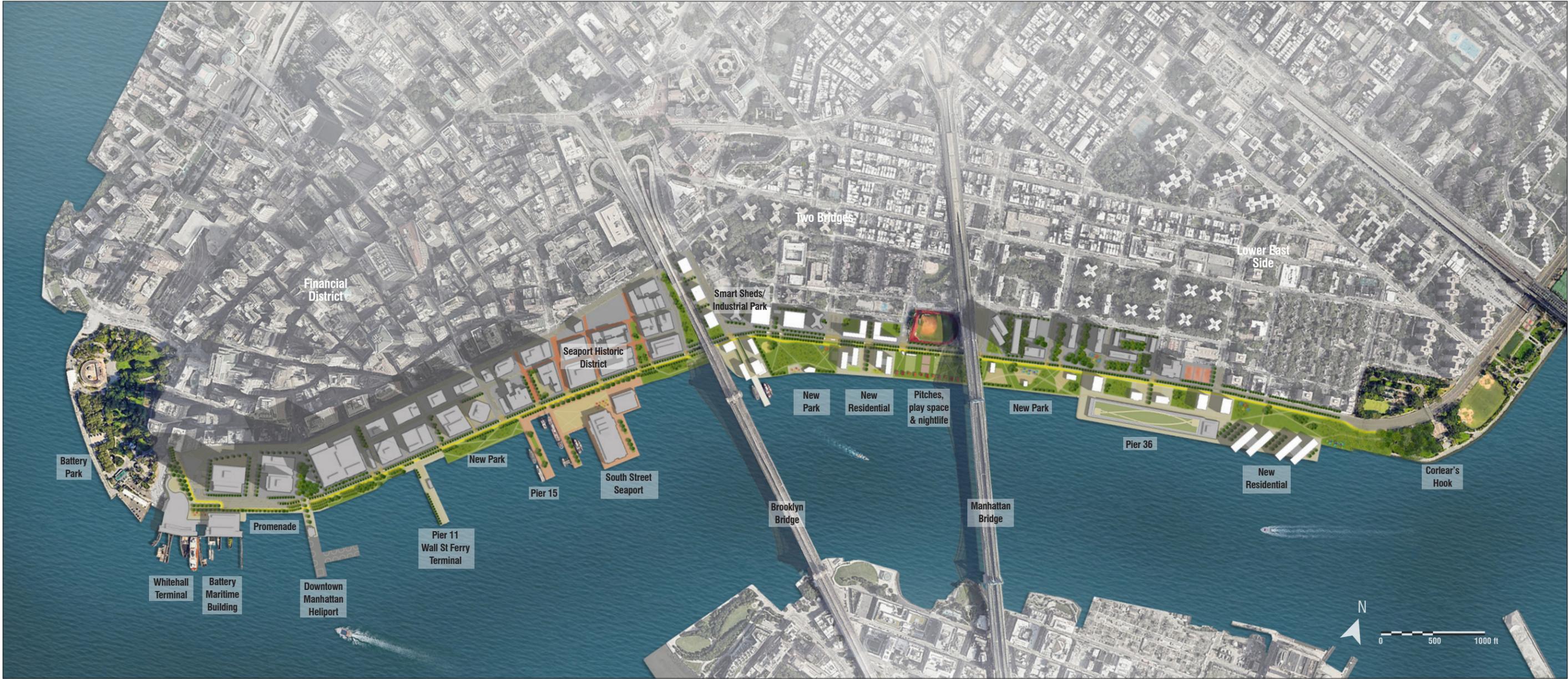
4

RENEW

Activate the coastline and lay a framework for a resilient community



ENVISIONING CHANGE



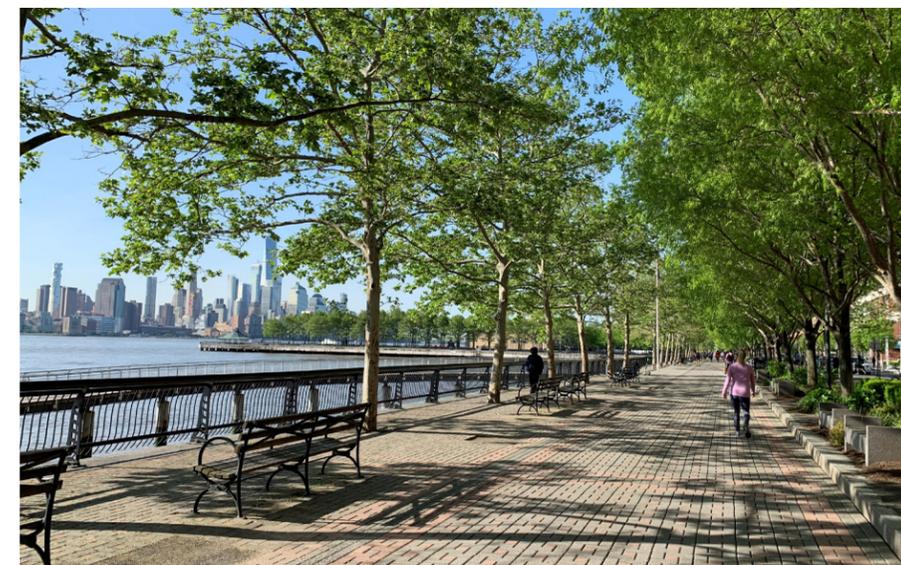
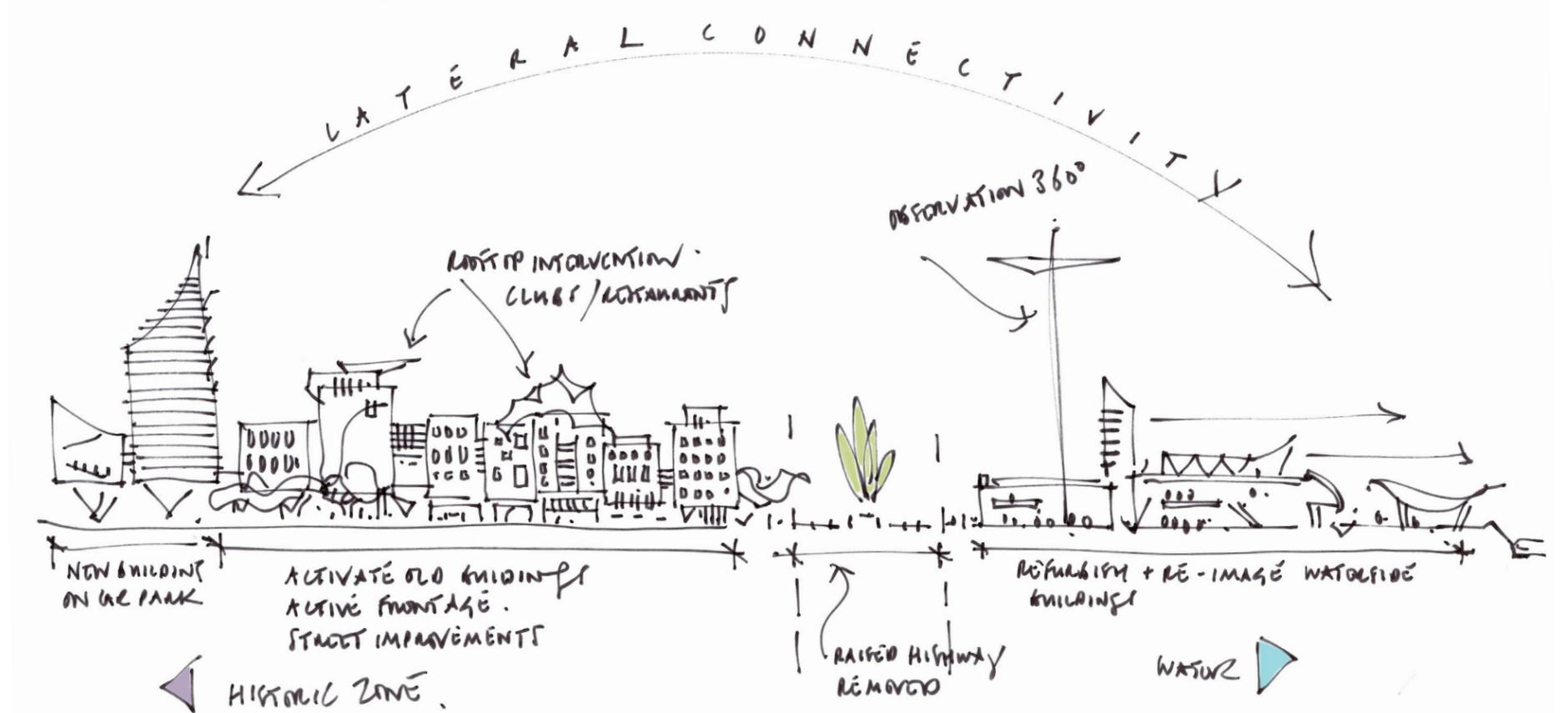
RECLAIMED PUBLIC SPACE

Once the heavy traffic flow has been streamlined, simplified, and moved below grade, a positive and engineered relationship with the landscape and pedestrian circulation, such as bike paths and other waterfront amenities can be implemented strategically at the ground level.

The new land available opens up and acts as a catalyst for a linear sequence of development opportunities to occur. Similar to Boston's Big Dig, the removal of the FDR viaduct will allow for development and regeneration opportunities along the waterfront. In addition, the complexities of the elevated multilevel roadways, specifically the Halberstam Memorial Ramps, will be simplified underneath the junction of The Brooklyn Bridge, therefore, freeing up new parcels for future development and increasing the value of adjacent sites.

The robust growth of the Financial District is creating the demand for more neighborhood services, community amenities, and open green space that can rival the proven west side's waterfront utilization found in Battery Park and Riverside Park. Rather than walling off our waterfront, the FDCIP mitigates the same issue while opening up the waterfront to the public and making it more inviting. Planting, physical contouring of landscaping, and tactile paving surfaces will be used in conjunction with the various architectural elements of the program.

When in place, the FDCIP will provide improved coastal protection to more than 100,000 vulnerable New Yorkers through 2.2 miles of enhanced waterfront, ecology, and urban spaces.



Example of public space along the waterfront

Public spaces



HARBOR DISTRICT

The Harbor District is currently characterized by the juxtaposition of overcrowded transport terminals, skyscrapers that have almost no pedestrian interaction at the ground level, and where the Battery Park Underpass abruptly resurfaces as the FDR drive. Pedestrians and cars share the same small space at the Governor's Island Ferry terminal, resulting in a busy and dangerous junction. Immediately next door, the busiest heliport in the city operates and users only add to the chaos.

The southernmost section of the masterplan will allow for enhanced lateral permeability between the high-density Financial District and the active waterfront between Whitehall Street and Maiden Lane. Once the viaduct is removed, visual linkages between the water's edge and the city will become perceptible. The ground floor of the skyscrapers can become active frontages that face the new public space along the water. Passengers using the ferry terminals and heliport will have safe, dedicated areas for passenger pickup/drop off and rider queuing while simultaneously expanding the entire linear path along the waterfront.



Whitehall Terminal
Battery Park Underpass Termination
Governors Island Ferry Terminal
Heliport



Harbor District Location



Whitehall Terminal
Governor's Island Ferry Terminal
Heliport

SEAPORT HISTORIC DISTRICT

This zone of the masterplan from Maiden Lane to the Brooklyn Bridge is characterized by the Historic South Street Seaport neighborhood. Since the construction of the original Dutch West India Company outpost in 1625, the Seaport played a significant role connecting New York City nationally and internationally through trade and travel. By the 1930's, newer ships requiring deeper ports caused the seaport to weaken as a centre of commerce. The construction of the elevated portion of the FDR in the 1950's bifurcated the village from the waterfront bringing the area into further decline.

As illustrated here, the scale of the waterfront buildings and those immediately behind is reduced with a range of brickfronted warehouse buildings providing a rich and tactile historic experience. The existing Pier 16 and the new Piers 15 and 17 will bring new life to the neighborhood through increased amenity offerings.

The lowering of the parkway will reinstate the connection between the piers and waterfront buildings, old and new, and the historic low-rise brick commercial and warehouse buildings. This will provide a rich and palpable historic experience showcasing the Seaport through the years. The relationship with the waterfront and the iconic Brooklyn Bridge is particularly important to this zone, but it is completely overshadowed by the presence of the direct connection ramps to the FDR. The significant building presence to the south of the highway offers fantastic opportunities for active waterside development and recycling of industrial heritage. The outcome will support the current evolution of the Seaport into a unique highly trafficked destination once again.



Seaport Historic District Location



SILICON SEAPORT

The neighborhood between the Brooklyn Bridge and the Manhattan Bridge is currently disconnected from public transportation and occupied largely by public housing, parking lots and storage facilities. In addition, the interchange for the Brooklyn Bridge takes up vast amounts of land that could be better utilized. With the FDR moved underground, the land that the interchange takes up will be minimized, and therefore open up new land for development. Taking advantage of the underutilized land and its location removed from activity, this neighborhood is an ideal location to integrate tech start-up culture and night-life into Manhattan. The strategic pairing of these two uses within an existing urban fabric of this neighborhood will strengthen and diversify economic offerings within Manhattan. In addition, new public realm improvements such as pedestrian crossings, generous sidewalks and cycle ways will allow the neighborhood to grow more cohesive and connected.

Technology in the city

In response to the global start-up landscape that is taking shape as well as existing market needs, New York has the potential to offer more than just ubiquitous computing by modernizing and promoting sustainable production with existing industries. SB+C's Smart Shed offers spatial solutions to logistical problems that arise when integrating tech industries with existing industrial uses. Smart Sheds can occupy the space that is released from the FDR interchanges.

Night-life

Night-life is also an integral part of New York City's culture, a revenue generator and tourist attraction. Over the years it has largely been pushed out of Manhattan in favor of new development that did not commingle with the use. This is an opportunity for development to support the food and beverage industry and create a vibrant zone for bars, nightclubs and live entertainment in an area where adjacent disturbance can be minimized.



Silicon Seaport District Location



View looking south from the Manhattan Bridge of future development along the coastal extension

TWO BRIDGES NORTH

This northernmost section of the linear sequence of four zones used to represent the lowest density, however that is changing with the development of One Manhattan Square and other ongoing developments. The growth will bring a new wave of residential tenants drawn in by the prospect on improved waterfront access. Removing the viaduct will promote waterfront access and activities, and create safe and unimpeded crossings across South Street.

With the new adjacent industrial uses in the Silicon Seaport neighborhood, the existing light manufacturing and uses from Pier 36 can relocate, and therefore create a buffer between the residential and the industrial uses.

The continued extension of the waterfront improvements to this neighborhood will enable it to become better connected to the surrounding areas. This is especially pertinent due to its lack of current connectivity and public transportation options. New pedestrian crossings, cycle lands and improved sidewalks will allow residents to enjoy the full extent of their neighborhood. The pier can become an extension of the neighborhood with offerings such as sporting facilities, a waterfront park or restaurants, therefore increasing the desirability and amenity offerings. The integration of markets and pavilions will also provide food staples and seasonal specialties to the neighborhood.



Two Bridges Neighborhood Location



PHASES 1 & 2

Phase 1: Harbor District

- Entrance to FDR South from Pearl Street closes permanently
- A new tunnel for Brooklyn Bridge access will be built under Dover Street and Dover Street temporarily becomes two ways between South Street and Pearl Street and westbound traffic will have improved access to the FDR North and Brooklyn Bridge ramps at Pearl Street
- The FDR viaduct from the Battery Park Tunnel to the Brooklyn Bridge as well as the FDR Northbound Brooklyn Bridge and Pearl Street ramp will be dismantled and removed
- Sections of South Street between Broad Street and Dover Street will be removed to facilitate the new tunnel
- FDR traffic will use South Street from the Battery Park underpass to the remaining section of viaduct north of the Brooklyn Bridge
- The elevated promenade will be installed at grade and covered over by a new South Street and promenade space
- The Broad Street intersection will be reconfigured and the new tunnel and access ramps to and from the Brooklyn Bridge will connect to the new first segment of the FDR tunnel

Phase 2: Seaport Historic District

- Frankfort Street closes temporarily to accommodate the installation of the next section of tunnel from Dover Street to where it will come out of the ground at the northwest corner of Gold and Frankfort Streets
- The new FDR tunnel portal will also connect to Gold Street
- Frankfort Street will be replaced and run one way west temporarily and terminate at Park Row as a U-Turn to the Brooklyn Bridge
- Extend Spruce Street west of Gold Street through Southbridge Towers to Robert Wagner Place (Avenue of the Finest) running one way, east and then north
- Robert Wagner becomes public between Madison Street and Pearl Street
- The new Spruce Street will run Westbound to Park Row to accommodate traffic going to the Brooklyn Bridge
- The current loop entrance to the bridge will be closed and reconstructed in place to connect with the tunnel portal at the northwest corner of Gold and Frankfort Streets
- The existing elevated ramps from the Southbound FDR and Pearl Street to the Brooklyn Bridge are dismantled



PHASES 3 & 4

Phase 3: Silicon Seaport

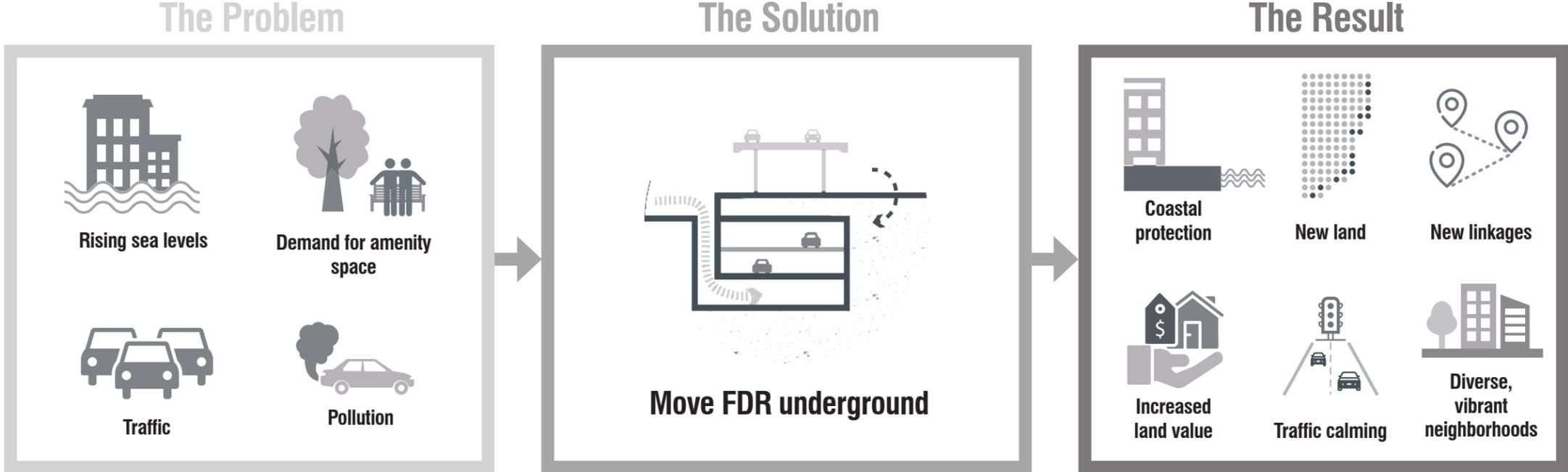
- Extend Cherry Street to Robert Wagner Place
- Reverse the travel direction of Water Street between Jefferson and Montgomery Streets
- Close portions of the South Street surface road between Dover Street and Jefferson Street to accommodate the construction of the new southbound FDR tunnel
- Connect the new tunnel to the existing southbound tunnel built in Phase 1 and Brooklyn Bridge/Civic Center ramp
- Connect the new tunnel with the southbound FDR in Corlears Hook Park
- Replace South Street as a new one-way northbound street temporarily and connect it to the northbound FDR
- Southbound local traffic will use Water Street and Cherry Street
- Dismantle the remaining section of the FDR viaduct

Phase 4: Two Bridges North

- Complete the northbound FDR tunnel from the Phase 1 tunnel and Brooklyn Bridge ramps to Corlears Hook
- Reconfigure the Brooklyn Bridge and Pearl Street ramp to connect to Frankfort Street and remove the northbound FDR connection
- Close the southbound Park Row ramp from the Brooklyn Bridge to complete the FDR access tunnel and connect it to the abandoned northbound Park Row ramp
- Restore the Park Row southbound access ramp in place



SUMMARY



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