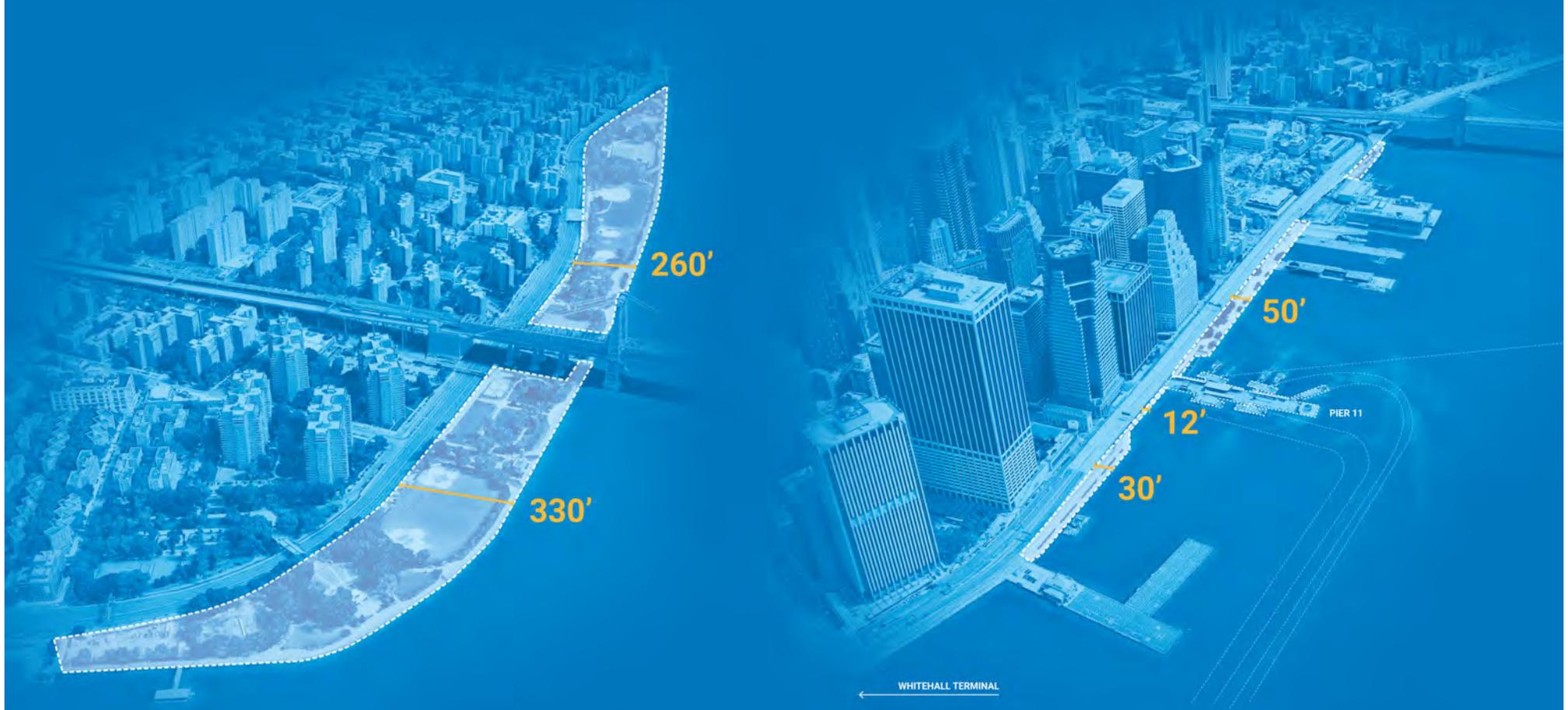


FINANCIAL DISTRICT AND SEAPORT CLIMATE RESILIENCE MASTER PLAN

HOW ARE THE FINANCIAL DISTRICT AND SEAPORT DIFFERENT FROM OTHER AREAS OF LOWER MANHATTAN?

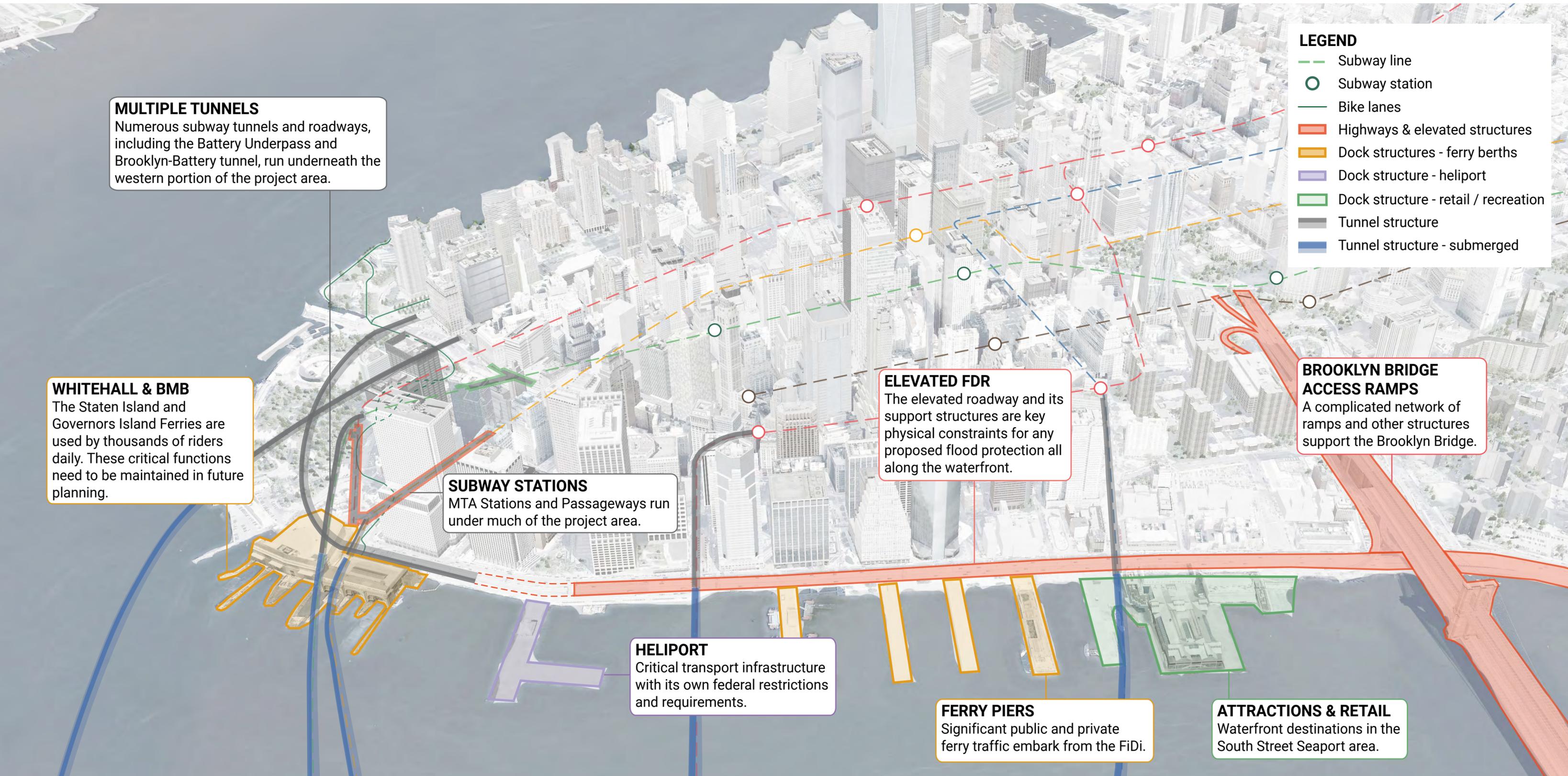


OTHER NEIGHBORHOODS, LIKE THE LOWER EAST SIDE, HAVE WIDE OPEN SPACES TO ACCOMMODATE COASTAL FLOOD PROTECTION.

SPACE IS LIMITED ALONG THE WATER'S EDGE IN FIDI-SEAPORT, MAKING IT CHALLENGING TO CONSTRUCT COASTAL FLOOD PROTECTION.

**THE FINANCIAL DISTRICT
AND SEAPORT HAVE
UNIQUE CONSTRAINTS
THAT REQUIRE US TO
EXPLORE A RANGE OF
FLOOD PROTECTION
OPTIONS, INCLUDING
EXTENDING THE
SHORELINE INTO THE
EAST RIVER.**

TRANSPORTATION INFRASTRUCTURE



LEGEND

- Subway line
- Subway station
- Bike lanes
- Highways & elevated structures
- ▭ Dock structures - ferry berths
- ▭ Dock structure - heliport
- ▭ Dock structure - retail / recreation
- ▭ Tunnel structure
- Tunnel structure - submerged

MULTIPLE TUNNELS
Numerous subway tunnels and roadways, including the Battery Underpass and Brooklyn-Battery tunnel, run underneath the western portion of the project area.

WHITEHALL & BMB
The Staten Island and Governors Island Ferries are used by thousands of riders daily. These critical functions need to be maintained in future planning.

SUBWAY STATIONS
MTA Stations and Passageways run under much of the project area.

HELIPORT
Critical transport infrastructure with its own federal restrictions and requirements.

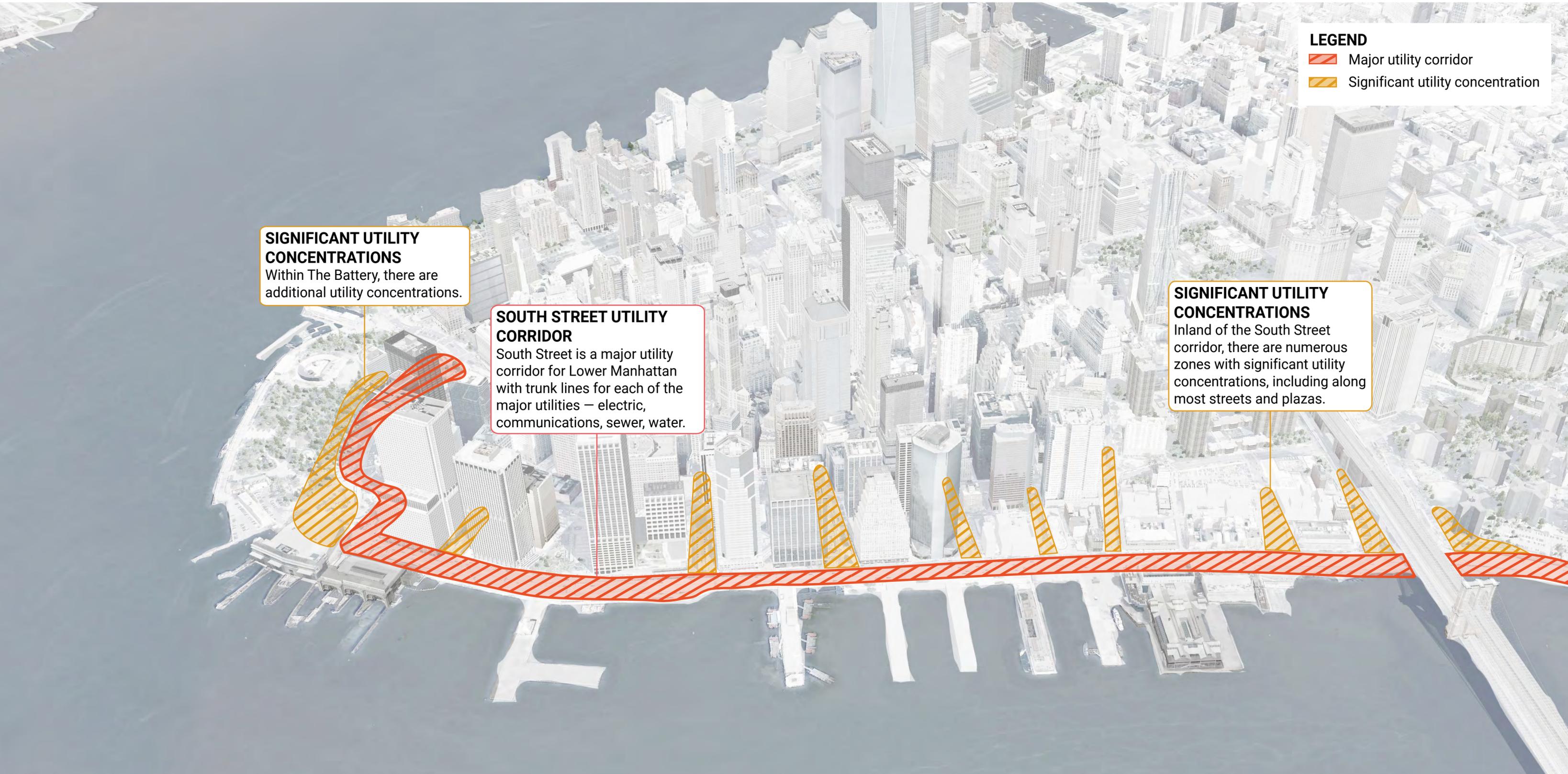
ELEVATED FDR
The elevated roadway and its support structures are key physical constraints for any proposed flood protection all along the waterfront.

FERRY PIERS
Significant public and private ferry traffic embark from the FiDi.

ATTRACTIONS & RETAIL
Waterfront destinations in the South Street Seaport area.

BROOKLYN BRIDGE ACCESS RAMPS
A complicated network of ramps and other structures support the Brooklyn Bridge.

MAJOR UTILITIES



LEGEND

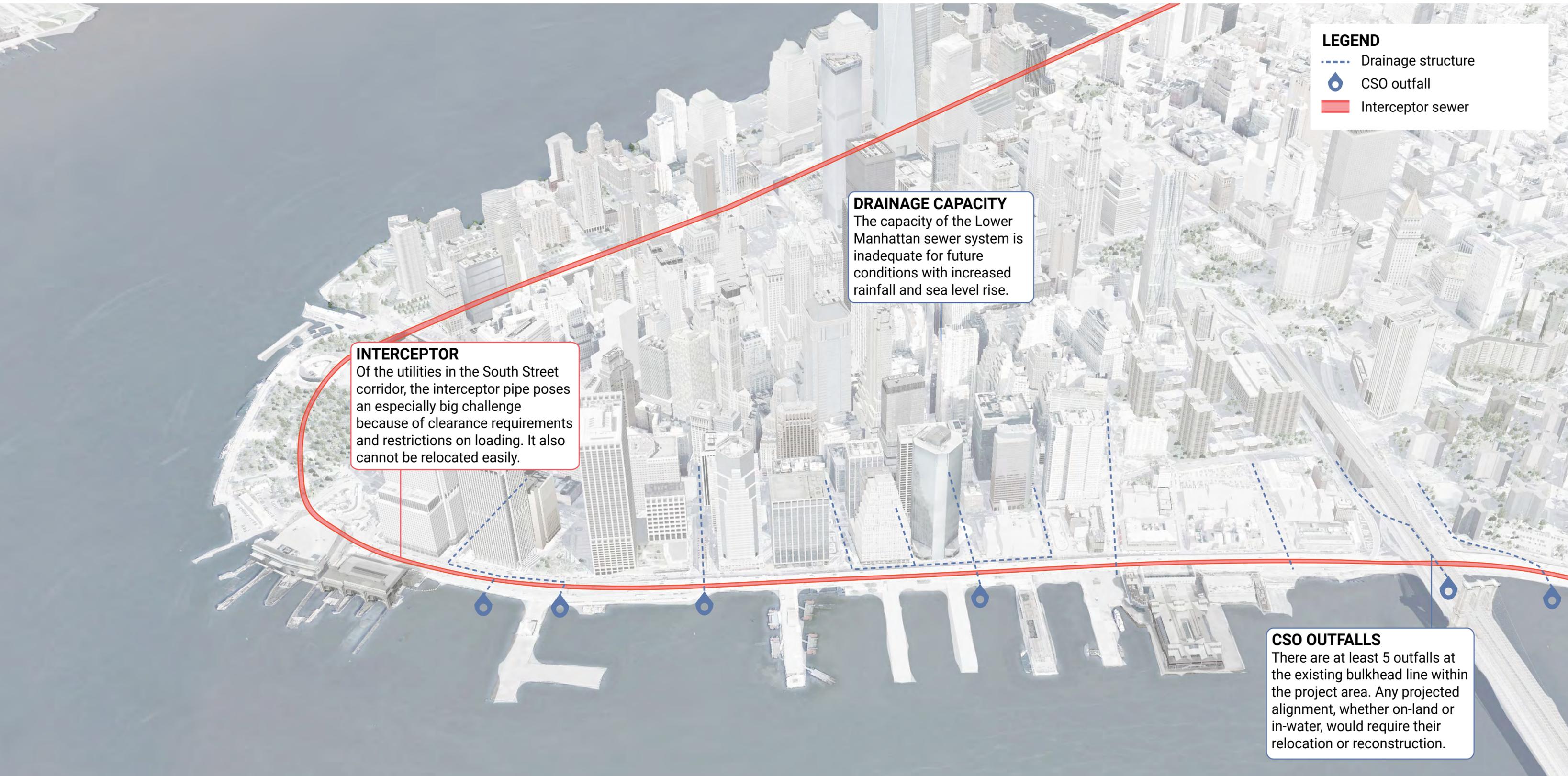
-  Major utility corridor
-  Significant utility concentration

SIGNIFICANT UTILITY CONCENTRATIONS
Within The Battery, there are additional utility concentrations.

SOUTH STREET UTILITY CORRIDOR
South Street is a major utility corridor for Lower Manhattan with trunk lines for each of the major utilities – electric, communications, sewer, water.

SIGNIFICANT UTILITY CONCENTRATIONS
Inland of the South Street corridor, there are numerous zones with significant utility concentrations, including along most streets and plazas.

WASTEWATER & COMBINED SEWER SYSTEM



LEGEND

- Drainage structure
- 💧 CSO outfall
- Interceptor sewer

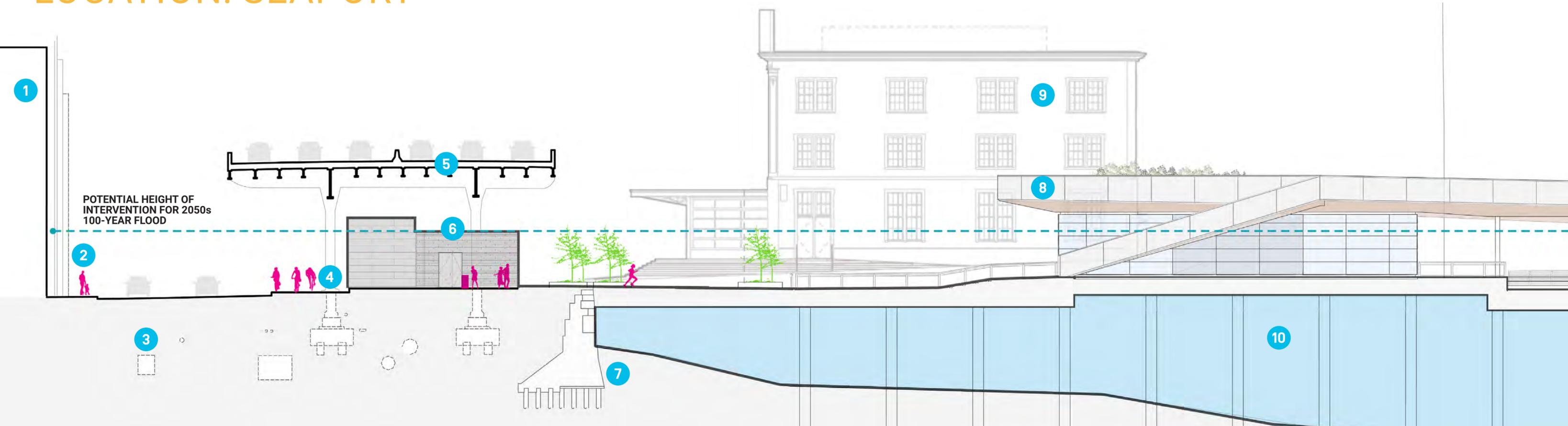
DRAINAGE CAPACITY
The capacity of the Lower Manhattan sewer system is inadequate for future conditions with increased rainfall and sea level rise.

INTERCEPTOR
Of the utilities in the South Street corridor, the interceptor pipe poses an especially big challenge because of clearance requirements and restrictions on loading. It also cannot be relocated easily.

CSO OUTFALLS
There are at least 5 outfalls at the existing bulkhead line within the project area. Any projected alignment, whether on-land or in-water, would require their relocation or reconstruction.

EXISTING CONSTRAINTS

LOCATION: SEAPORT

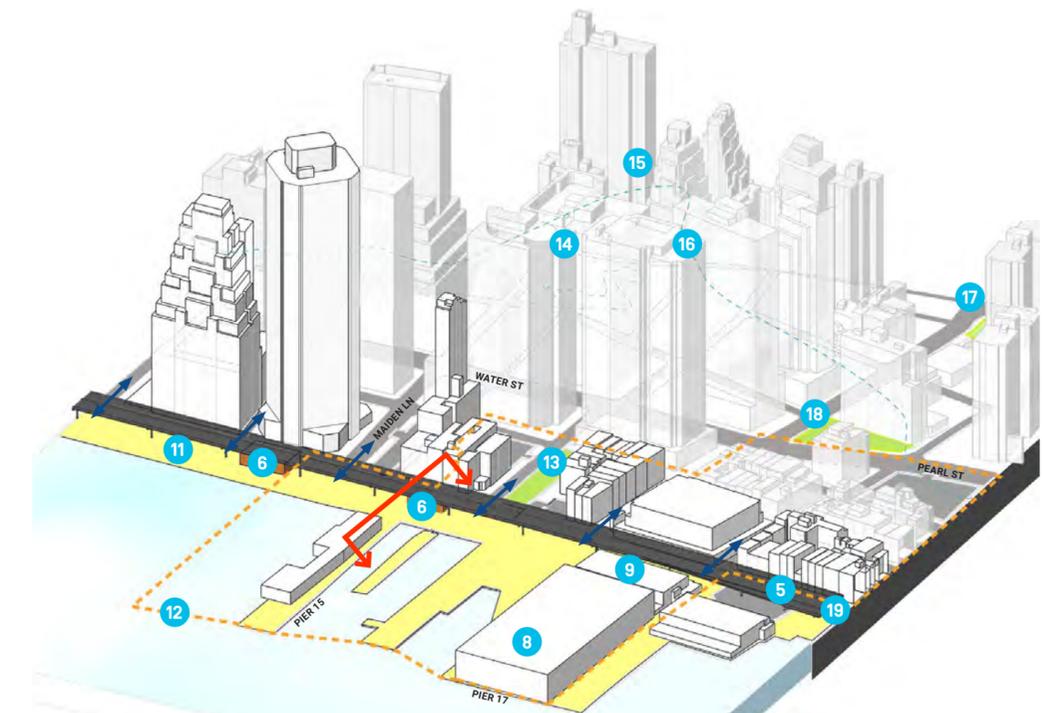


ILLUSTRATIVE SECTION TAKEN AT PIER 15 LOOKING NORTHEAST.

- 1 HISTORIC BUILDINGS LESS THAN 6 STORIES TALL
- 2 ACTIVE WATERFRONT ACCESS AND PEDESTRIAN CIRCULATION
- 3 EXISTING UTILITIES AND CRITICAL SUBSURFACE INFRASTRUCTURE
- 4 3' OFFSET REQUIRED AROUND FDR COLUMNS AND FOOTINGS
- 5 ELEVATED FDR DRIVE
- 6 EXISTING STRUCTURES
- 7 VARYING BULKHEAD AND SUBSURFACE CONDITIONS
- 8 ACTIVE WATERFRONT COMMERCIAL AND RECREATIONAL USES
- 9 ONGOING CONSTRUCTION

- 10 PILE-SUPPORTED PIER
- 11 PILE-SUPPORTED STRUCTURES
- 12 HISTORIC DISTRICT BOUNDARY
- 13 WATERFRONT ACCESS AND VIEW CORRIDORS
- 14 LOW LYING TOPOGRAPHY
- 15 LARGE OFFICE BUILDINGS IN DENSE NETWORK OF NARROW STREETS
- 16 2050s 100-YEAR FLOODPLAIN
- 17 FULTON STREET STATION (ONE BLOCK NORTH)
- 18 A/C SUBWAY TUNNEL
- 19 CONCENTRATION OF UTILITIES ON SOUTH STREET

- SECTION CUT
- 2050s 100-YEAR FLOOD
- ESPLANADE
- PARK
- HISTORIC DISTRICT
- EXISTING STRUCTURES
- WATERFRONT CONNECTION



**TODAY, CITIES
AROUND THE WORLD
ARE DEVELOPING
INNOVATIVE
SOLUTIONS TO ADAPT
TO CLIMATE CHANGE.**



BUFFALO BAYOU PARK

Houston, Texas

Green Infrastructure + Urban Parkland

The Park is a 160-acre open space that helps manage flooding from Buffalo Bayou.

Added Benefits:

- Restores urban ecology
- Resilient to periodic inundation
- Stabilizes the flood channel
- Increases accessibility across bayou
- Provides new recreational amenities



SCHEVENINGEN BOULEVARD

The Hague, Netherlands

Underground Sea Wall + Public Space

The New Boulevard covers a weak spot in the city's coastal defense, while offering many more uses that residents can enjoy.

Added Benefits:

- Preserves waterfront connection
- Supports local and regional tourism
- Enhances the public realm



WUHAN YANGTZE RIVERFRONT PARK

WUHAN, CHINA

Flood Protection + Waterfront Park

The 2,000-acre riverfront park protects the city from when river levels are high while allowing residents to gather and play by the water when river levels are low. The riverfront includes 1,300 acres of new green space and 700 acres of restored green space.

Added Benefits:

- Enhances connection to the water
- Increases regional biodiversity and supports urban ecology
- Supports seasonal landscapes
- Promotes historical preservation
- Provides safe in-water recreation



CLIMATE TILE

COPENHAGEN, DENMARK

Flood Reduction + Neighborhood Improvements

Climate tile is a concept to help reduce flooding in cities that experience increased rainfall.

Added Benefits:

- Collects and manages stormwater
- Adds to existing drainage system
- Mitigates flash flooding
- Supports added greenery on streets



SMART TUNNEL

KUALA LUMPUR, MALAYSIA

Stormwater Management + Transportation Artery

The multi-level tunnel integrates stormwater storage into its design, allowing the tunnel to serve multiple purposes.

Added Benefits:

- Provides flexible stormwater storage solution
- Reduces service disruptions during storms



HISTORIC FOURTH WARD PARK

ATLANTA, GEORGIA

Stormwater Management + New Parkland

The project stores stormwater on site to reduce flooding, while transforming a low-lying industrial area into a space for recreation.

Added Benefits:

- Reduces flooding and sewer overflows
- Offers unique recreational amenities
- Supports broader economic development strategy

THE FINANCIAL DISTRICT AND SEAPORT CLIMATE RESILIENCE PLAN

Our work will help identify a viable project to protect the FiDi-Seaport area. Your engagement is core to the success of this effort.

WHAT IS A CLIMATE RESILIENCE PLAN?

A process to identify a resilience project that combines:

- Climate science
- Robust community engagement
- Engineering and technical analysis
- Urban planning and design
- Implementation planning

WHAT CAN WE ACHIEVE BY THE END OF THIS PROCESS?

- Develop a conceptual design of flood resilience infrastructure to protect the Financial District and Seaport
- Identify a first phase project that can move forward into implementation
- Create a drainage strategy to manage wastewater
- Develop a pathway to fund and finance this infrastructure project
- Build the foundation for an intergenerational coalition to carry this project forward past 2021
- Work with regulatory agencies to identify a pathway for permitting and approvals

WHAT ARE OUR GUIDING PRINCIPLES?

Guiding Principles convey our goals and desired outcomes and will help us evaluate different options for the resilience project. Later in the process, these Guiding Principles will be translated into a Purpose and Need statement, which regulatory agencies will use to evaluate the project once we apply for permits.

DRAFT GUIDING PRINCIPLES

These will change with your feedback tonight and as we gather more input from stakeholders.

- 1** Protect the life and safety of residents, workers, and all New Yorkers who use Lower Manhattan, from the impacts of climate change.
- 2** Safeguard Lower Manhattan as a cornerstone of the city's transportation network and economy.
- 3** Plan a project that is feasible, financeable and implementable, with a broad coalition of support, and clear regulatory and permitting pathways.
- 4** Set a global precedent for best-in-class resiliency infrastructure that maximizes ecologically-sensitive design, sustainability, and future adaptability.
- 5** Maximize enhancements to the waterfront public realm with strong public connections, water-dependent transportation, and recreational uses.

ARE WE MISSING ANYTHING? DO YOU HAVE ANY SUGGESTIONS OR FEEDBACK FOR OUR GUIDING PRINCIPLES?

WHAT HAVE WE DONE SO FAR?



TECHNICAL & ENGINEERING

- **Documented existing infrastructure**, including the combined sewer system, underground electrical lines, elevated and below-grade roads, subway tunnels, ferry piers, and more.
- **Developed computer models** of East River flows, rainfall events, and the combined sewer system.
- **Reviewed past studies and lessons learned** from other large-scale resilience and infrastructure projects.



IMPLEMENTATION

- **Met with key state and federal regulatory agencies** to understand their concerns and what we will need to study for future permitting processes.
- **Formed a team of several City agencies** to inform and carry out the resilience plan, including NYC Parks, Department of Transportation, Department of City Planning, Department of Environmental Protection, and more.
- **Documented the range of potential funding and financing sources** that might be available for this project.



ENGAGEMENT

- **Launched the Climate Coalition of Lower Manhattan**, bringing together local community, environmental, and resilience stakeholders.
- **Held a kick-off meeting of technical advisors** with expertise in climate science, resilience, infrastructure and engineering to provide input and act as a sounding board for our technical analyses.
- **Briefed over 150 organizations and key stakeholders** over the last year, held “office hours” in the community, shared information on LinkNYC, and conducted other outreach.
- **Spoke with other cities in the US and abroad** to learn about how they have tackled similar infrastructure challenges.



URBAN DESIGN

- **Explored opportunities** for enhanced transportation access and public realm.

WHAT HAVE WE LEARNED SO FAR?



TECHNICAL & ENGINEERING

- **The FiDi-Seaport area varies greatly from north to south in terms of existing conditions and risk.** There is no one-size-fits-all solution for the entire area.
- **Soil conditions vary greatly within the FiDi-Seaport area** because past generations of New Yorkers expanded Lower Manhattan's shoreline.
- **Major new drainage infrastructure will be needed** to handle future rainfall and prevent sewer backups – and to protect from tidal flooding and coastal storms.
- **Our plan needs to consider what Lower Manhattan will be like in the future, not just what it is like today.** The impacts of daily tidal flooding require us to rethink transportation infrastructure and historic districts in the context of climate change.



IMPLEMENTATION

- **There is limited data on the ecology of the East River.** We will need to study and document habitats and marine life in the river.
- **We need to carefully analyze the velocities and water levels in the East River** to understand potential impacts of any project to boat traffic and underground structures (e.g. subway tunnels, bridge columns).
- **Substantial funding from multiple sources** will be necessary to implement an infrastructure project of this scale.



ENGAGEMENT

- **We have a responsibility to share clear, science-based information on climate change and adaptation.** We need to empower people with information on climate risks and be transparent about our analysis so that the public can be meaningfully involved in the planning process.
- **There is a broad diversity of people invested in the future of Lower Manhattan.** Our engagement must be inclusive of this diversity and use creative tools to reach wide audiences.
- **This project will only succeed if New Yorkers believe in the need to adapt Lower Manhattan to climate change.** We need to have an open dialogue with the public on the costs and benefits or tradeoffs of any resilience project.



URBAN DESIGN

- *This analysis will begin in Spring 2020.*

WHERE DO WE GO FROM HERE?

- 1 **Incorporate your feedback from tonight into our work.**
- 2 **Begin to identify which resilience tools would make the most sense in each sub-area within FiDi-Seaport.**
- 3 **Continue engagement with the Climate Coalition for Lower Manhattan, technical advisors, and the public.**

HOW WILL WE IDENTIFY A RESILIENCE PROJECT & WHAT COMMUNITY INPUT DO WE NEED?



- Is there anything else we should study or consider?
- What are the guiding principles that should define this project?
- How should we define what a resilient future looks like?
- How should we structure our engagement process?

- What are the key project tradeoffs and how should they be weighed against one another?
- What design criteria should we use when evaluating project options?

- What are your top priorities for the project to achieve beyond core resilience goals?
- How can we start building a coalition to carry this project forward into implementation?
- What criteria should we use to define the first phase project?

- How should we best communicate the outcomes of our analysis and resilience plan process?
- What are the next steps for implementation?

HOW WILL COMMUNITY MEMBERS BE INVOLVED?

WHAT ROLE CAN YOU PLAY?

- Raise awareness of the climate risks we face and the need for action
- Shape the vision and design of the plan
- Engage in discussion of project costs and benefits or tradeoffs
- Help us organize events and bring a diversity of voices to the table
- Be part of a generational coalition to ensure a more resilient future

HOW WILL WE BE REACHING OUT?

- Interactive open houses
- Tabling at community events
- Pop-up events and activities
- LinkNYC announcements
- One-on-one outreach
- Social media campaigns
- Online surveys
- School & student collaborations

HOW CAN YOU STAY INVOLVED?

STAY IN THE LOOP

Share your email with us to stay engaged in the planning process.

COME TO OUR EVENTS

Join our email list and follow us on social media and we'll make sure you're invited to the next event.

SHARE YOUR FEEDBACK

We'll be reaching out throughout the project to get your input.

SPREAD THE WORD

Talk to your family, friends, coworkers, and neighbors about the climate risks and how we can take action together.

WANT TO LEARN MORE?

Visit nyc.gov/LMCR

WANT TO REACH OUT?

Email us at
lmcr@cityhall.nyc.gov

FIND US ON:

f NYCEDC
@NYCEDC & @NYClimate
@NYCEDC

CLIMATE COALITION FOR LOWER MANHATTAN

The Climate Coalition for Lower Manhattan (CCLM) is a group of residents and businesses, resilience and environmental advocates, community organizations, local institutions, and schools who are invested in the future of Lower Manhattan.

The Coalition is co-chaired by Anthony Notaro of Community Board 1 and Elizabeth Yee of the Rockefeller Foundation. The Coalition will help educate the public on climate risks, bring people along throughout the process, and build advocacy for action on climate change. The Coalition will also provide critical input to help shape a shared City and community vision for a project to protect the FiDi-Seaport area from climate change. Key ideas and takeaways from the Coalition's first meeting, which was convened in December 2019, are shown below.



GOALS AND STRUCTURE OF THE CCLM

- Be able to sustain itself through political changes in coming years
- Provide constructive criticism to project team
- Develop understanding of technical analysis and alternatives in order to fully participate in the planning process
- Include a broad base of people to represent many perspectives

CLIMATE RESILIENCE PLAN GUIDING PRINCIPLES

- Be adaptable to future conditions
- Protect quality of life and provide safety and security
- Set a global precedent with best-in-class design

ENGAGEMENT

- Empower people rather than focus only on the doom and gloom
- Emphasize the project's importance to entire city and region
- Engage the public on planning process, engineering options, funding pathways, and broader regional impacts
- Use a campaign-style approach to target messages to specific audiences

WHAT WE WANT TO HEAR FROM YOU

1 WHAT IS MOST IMPORTANT FOR THE PROJECT TEAM TO STUDY?

2 WHAT DO YOU WANT TO LEARN MORE ABOUT?

3 WHAT IS THE BEST WAY FOR US TO INVOLVE YOUR FAMILY, FRIENDS, COWORKERS, AND NEIGHBORS?

4 WHAT SHOULD OUR NEXT PUBLIC EVENT FOCUS ON?