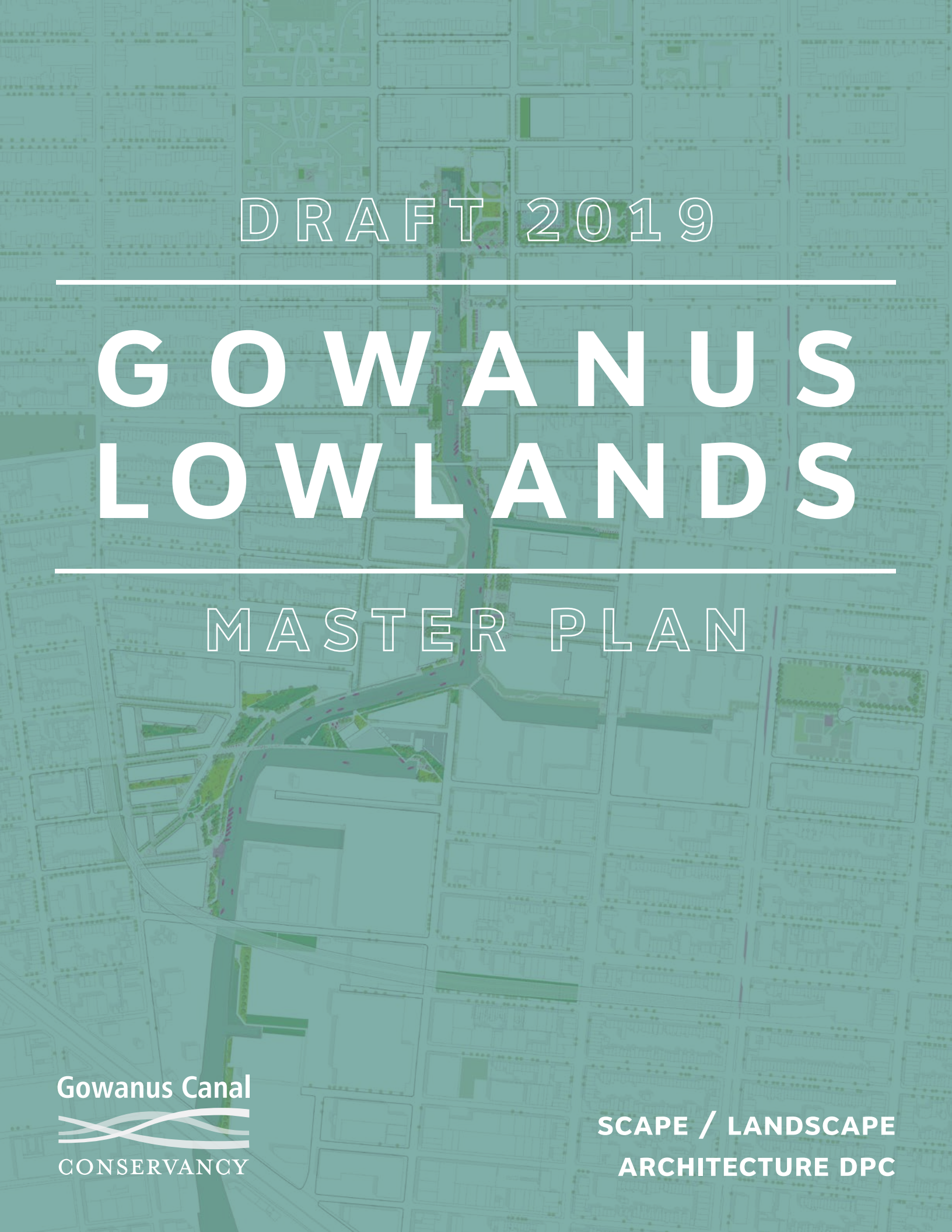




DRAFT 2019

GOWANUS LOWLANDS

MASTER PLAN

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ABOUT

Gowanus Canal Conservancy is dedicated to facilitating the development of a resilient, vibrant, open space network centered on the Gowanus Canal through activating and empowering community stewardship of the Gowanus Watershed.

Since 2006, Gowanus Canal Conservancy has served as the environmental steward for the Gowanus neighborhood by leading grassroots volunteer projects; educating students on environmental issues; and working with agencies, elected officials, and the community to advocate for, build, and maintain innovative green infrastructure around the Gowanus Canal.

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GOWANUS LOWLANDS

The Gowanus Lowlands Master Plan is a community-based vision for a public realm centered on the Gowanus Canal, formed from a network of parks, privately-owned public waterfront esplanades, and greened corridors. The Gowanus Lowlands will provide the community with accessible green space, cultural resources, and recreational amenities while serving multiple functions through increased flood resilience, mitigation of the impacts of the urban heat island effect, creation of habitat, stormwater management, and reduction in pressure on the sewer system.

The Gowanus Lowlands Master Plan builds upon multiple planning and clean-up processes to harness major investment towards the creation of an accessible, vibrant, and resilient network of parks and public spaces centered on the Gowanus Canal and connected to the surrounding watershed.

WHO IS THIS FOR?

COMMUNITY

The Gowanus Lowlands Master Plan is an evolving document that compiles community priorities for neighborhood open space and resiliency, gathered through ongoing outreach to the diverse constituents throughout the neighborhood. It serves as a tool for the community to use in advocating for design, policy, and investment.

AGENCIES

The plan provides recommendations for planning and policy at multiple levels of government, including:

- The Gowanus Waterfront Access Plan, *Department of City Planning (DCP)*
- Policies around Stormwater & Sewage, *Department of Environmental Protection (DEP)*

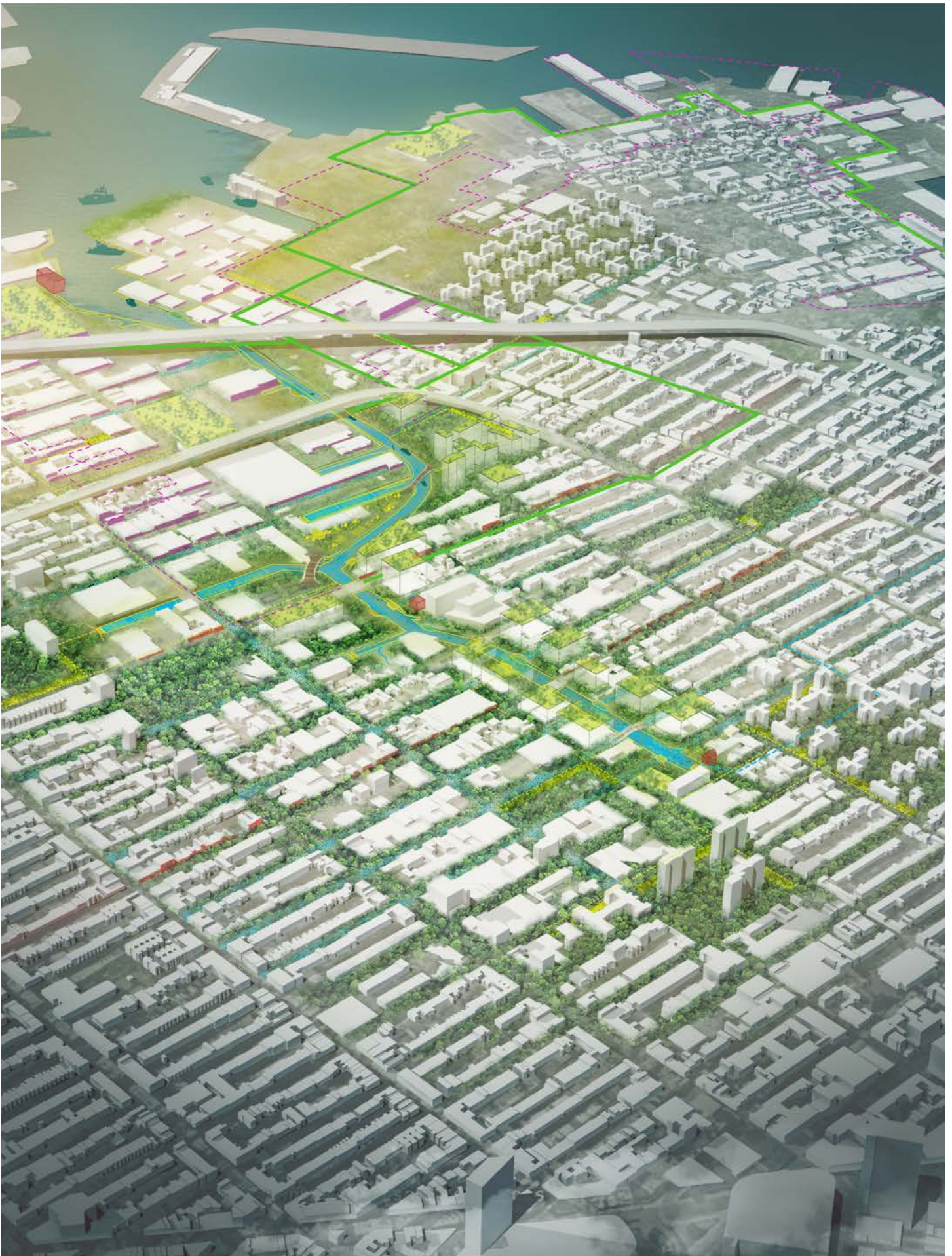
The plan provides recommendations for investment in capital improvements, including:

- Investment in new and existing parks, *Department of Parks and Recreation (DPR)*
- Design and programming priorities for CSO tanks, *Department of Environmental Protection (DEP)*
- Streetscape improvements, *Department of Transportation (DOT)*
- Investment in green infrastructure, *Department of Environmental Protection (DEP)*
- Priorities and design guidelines for remediation and restoration, *Environmental Protection Agency (EPA), NYS Dept of Environmental Conservation (DEC), US Fish and Wildlife Service (USFS), and National Oceanic and Atmospheric Administration (NOAA)*

LANDOWNERS

The plan provides guidelines and technical assistance for the design and management of privately owned landscapes, including:

- Design and programming guidelines for required Waterfront Public Access Areas (WPAAs)
- Design guidelines for required street tree plantings and other streetscape improvements
- Recommendations and technical assistance for stormwater & sewage best practices
- Plant species guidelines



CONTEXT

The future of Gowanus is at a critical phase with the confluence of several major long-standing efforts: the federally mandated Superfund cleanup and pollution controls; related site cleanups overseen by the state; and probable land use changes through a City Planning rezoning that will cue both private development and city investment in the public realm.



Bernard Ratzer, Plan of the City of New York in North America, surveyed in the years 1766 & 1767

A TIDAL ESTUARY FED BY FRESHWATER CREEKS

The Gowanus neighborhood was once a system of tidal creeks winding through a vast salt marsh and fed by freshwater streams flowing from present day Park Slope and Carroll Gardens. This rich brackish confluence fostered oysters the size of dinner plates, and was an important stopping ground for migratory birds. As New York City grew, Dutch settlers built dams to harness the energy of the tides for tidal mills. The footprint of the former salt marsh is the geographical frame for the Gowanus Lowlands - an urban neighborhood in which the salt marsh continues to assert itself through frequent flooding, unstable soils, and rich tidal ecology.

INDUSTRY

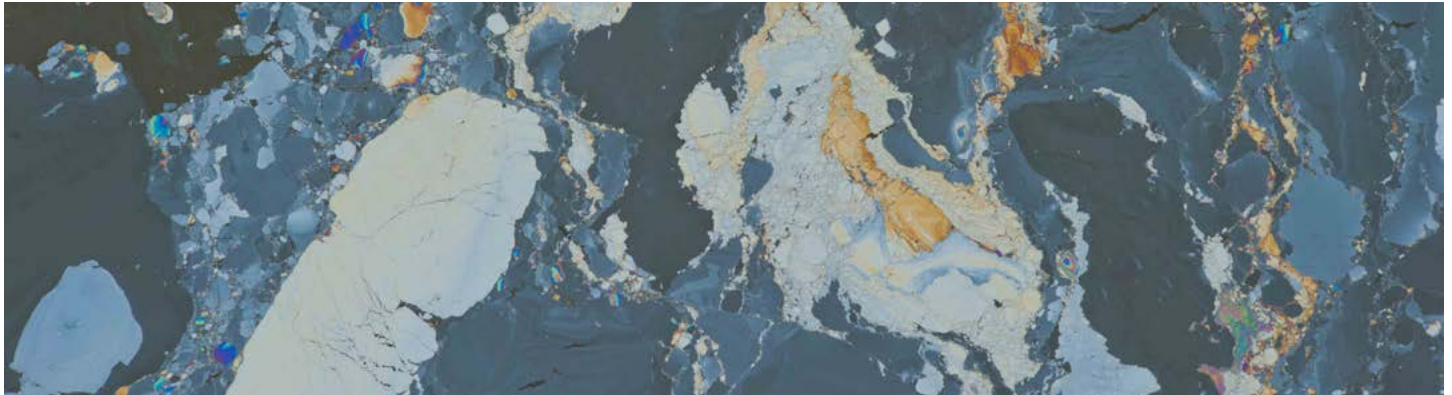
The system of creeks and estuaries in the Gowanus lowlands was dredged and channelized into the 1.8-mile-long Gowanus Canal, completed around 1869. The canal banks were home to a number of industries, including manufactured gas plants, factories, foundries, coal yards, and ship yards. One of the busiest industrial canals in the country, the narrow waterway was crowded with barges carrying materials and goods for these industries, and the growing Brooklyn neighborhoods beyond. This productive industrial period left a legacy of textures, structures and emergent ecologies which give Gowanus character and form today.



Metropolitan Gas Works from Canal facing North, 1930's, National Grid Archives

HISTORIC INDUSTRIAL CONTAMINATION

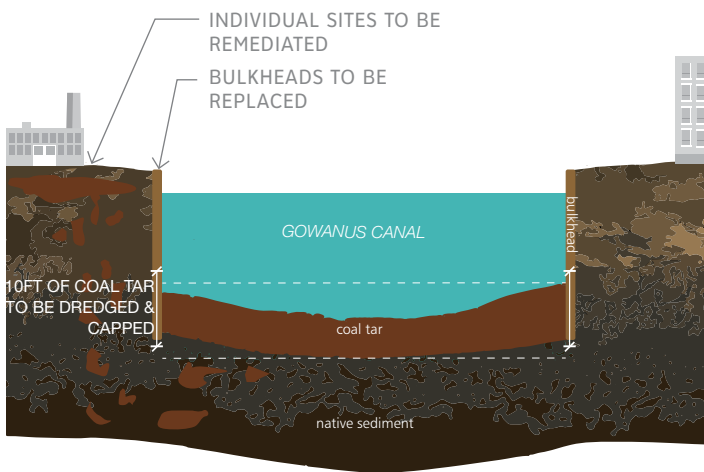
The heavily productive industrial years also left a legacy of industrial contamination in the canal and on its banks. The primary contaminant of concern is coal tar, a by-product from manufactured gas plants, but there are numerous other contaminants in the soil and sediment.



Coal tar at the bottom of the canal releases gases that rise to the surface and create oil-like sheens.

SUPERFUND REMEDIATION

In 2010, the Gowanus Canal was designated a federal Superfund site by the Environmental Protection Agency (EPA). This spurred a \$500 million clean-up process to dredge an average of 10 feet of contaminated sediment for the bottom of the canal, and cap the native sediment below.



Dredging equipment for the 4th Street Turning Basin pilot project

NATURAL RESTORATION DAMAGES

Under Superfund law, the designation also initiated a Natural Restoration Damages Assessment, through which trustees appointed from state and federal agencies: NYS Dept of Environmental Conservation (DEC), US Fish and Wildlife Service (USFS) and National Oceanic and Atmospheric Administration (NOAA), will evaluate the ecosystem damages resulting from the contamination and negotiate a legal settlement with Potentially Responsible Parties (PRPs) to fund restoration projects to restore these ecosystem services.

SITE CLEANUPS

Most sites along the Canal have some level of industrial contamination from previous uses, and require clean-up before any new major construction or development. This is generally undertaken by private landowners under the DEC Brownfields program, which provides a tax incentive for brownfield remediation. As the exception, the 3 former Manufactured Gas Plants (MGPs) will be remediated by National Grid - see map on page 17.

ONGOING CONTAMINATION AND ENVIRONMENTAL ISSUES

COMBINED SEWER OVERFLOW

The Gowanus Watershed has a combined sewer system which overflows and discharges about 363 million gallons of combined sewer overflow (CSO), a mixture of raw sewage and stormwater run-off, each year.

Under the Superfund and the Clean Water Act, the City is required to reduce CSO into the canal through investments in grey and green infrastructure, which will include two large sewage detention tanks, a sewer separation project, upgrades to pumping stations, and approximately 70 curbside rain gardens.

After this work is completed, an estimated 115 million gallons of CSO will continue to flow into the canal every year. While this figure complies with the minimum State Water Quality Standards, it does not account for expected increases in population due to the pending City Planning rezoning and increases in precipitation due to climate change.



Rendering of the RH-034 head house. Source: DEPI/Selldorf

See more information in *Stormwater & Sewage Chapter*

FLOODING

The springs, creeks, and saturated soils of the former salt marsh also often complicate inhabitation of this low-lying area - streams run through many basements, and a high groundwater table causes almost immediate street flooding during rain events.



Flooding along 9th Street

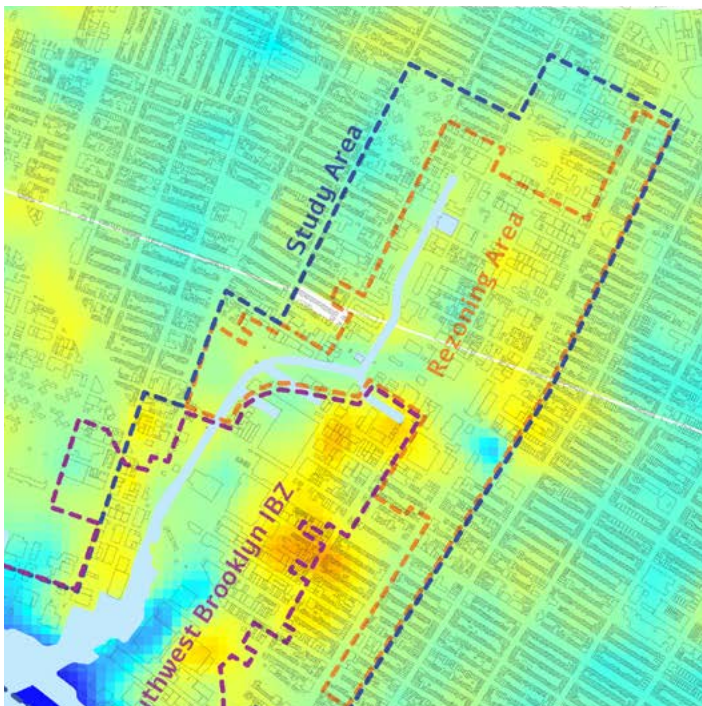
COASTAL FLOODING

In addition to street flooding, the blocks adjacent to the Gowanus Canal are in the flood zone, and were inundated during Hurricane Sandy. As sea level rises, this area will see more frequent high tides and coastal flooding.

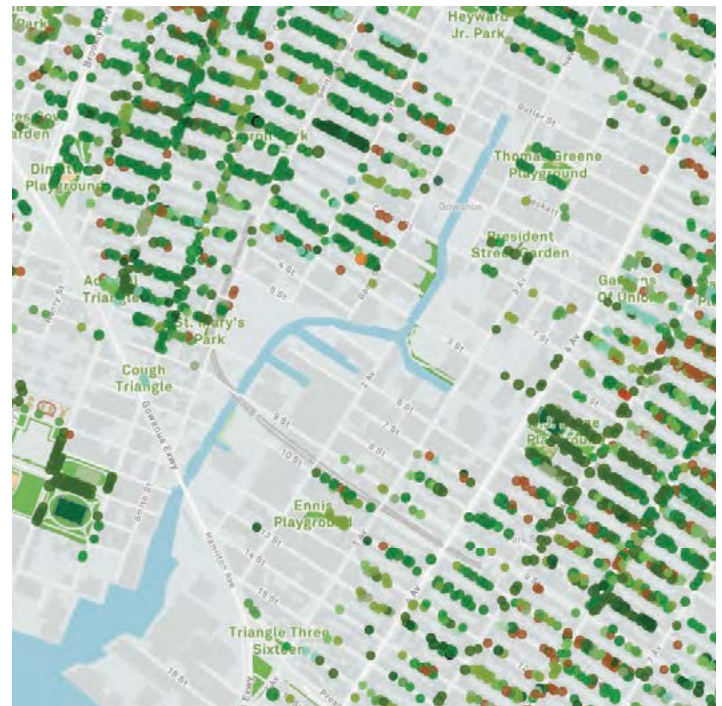


HEAT ISLAND & LACK OF TREE CANOPY

During dry weather, the Gowanus neighborhood is an urban heat island. This is largely because of the lack of mature trees in the industrial and mixed-use neighborhood surrounding the canal.



Land Surface Temperature, 2019
Source: Landsat 8, Urban Land Institute Climate Modeling Team



Street Trees over 12" caliber
Source: NYC Street Tree Map, from 2015 census data

LAND USE

RECENT NEIGHBORHOOD LAND USE ACTIONS

Over the last 10 to 15 years, there have been a series of related land use actions and planning processes in Gowanus that have responded to the planned clean-up of the canal, to land use and population changes in adjacent neighborhoods, and to City priorities for land use.

2003: PARK SLOPE REZONING

This City-led action down-zoned Park Slope to preserve the historic scale of the brownstone neighborhood, and upzoned 4th Avenue to provide increased opportunities for residential and commercial development. This action has been criticized for increasing density without providing more affordable housing or public benefits.

2008-2015: 365-363 BOND REZONING

This private application for a higher density residential development along the waterfront was approved in 2008, but the original development team walked away from the project when the canal was designated a Superfund site in 2010. New developers purchased the property and completed the site clean-up, building construction, and the waterfront esplanade in 2015.

2009: GOWANUS NEIGHBORHOOD REZONING PROPOSAL

The Bloomberg administration put forward a rezoning proposal that would allow higher density residential uses in the northern part of the neighborhood. This was put on hold after the Superfund designation in 2010.

2009: WATERFRONT TEXT AMENDMENT

This City text amendment clarified that change-of-use developments along the Gowanus Canal are subject to regulations that require the construction and maintenance of waterfront esplanades.

2012: WHOLE FOODS ZONING VARIANCE

This private application for variance to allow a commercial supermarket in an manufacturing zone was approved in 2012. Whole Foods completed site clean-up, building construction, and the waterfront esplanade in 2013.

2013-2015: BRIDGING GOWANUS

In response to the actions above, Council Member Brad Lander convened the Bridging Gowanus community planning process to identify priorities for future land use changes. These included supporting a mix of uses, affordable housing, investment in the public realm, sustainability, resiliency, arts, and culture.

GOWANUS NEIGHBORHOOD REZONING PROPOSAL

In 2016, the NYC Department of City Planning (DCP) initiated a Gowanus Neighborhood Planning Study to determine strategies for the future development of the land around the Gowanus Canal. The proposed City Planning rezoning would change the land use north of Third Street from low-rise manufacturing to a higher-rise mix of uses. This land use action will be accompanied by policy and investment commitments from the City.

2016: GOWANUS NEIGHBORHOOD PLANNING STUDY

2018: GOWANUS FRAMEWORK RELEASE

2019: ZONING PROPOSAL RELEASE

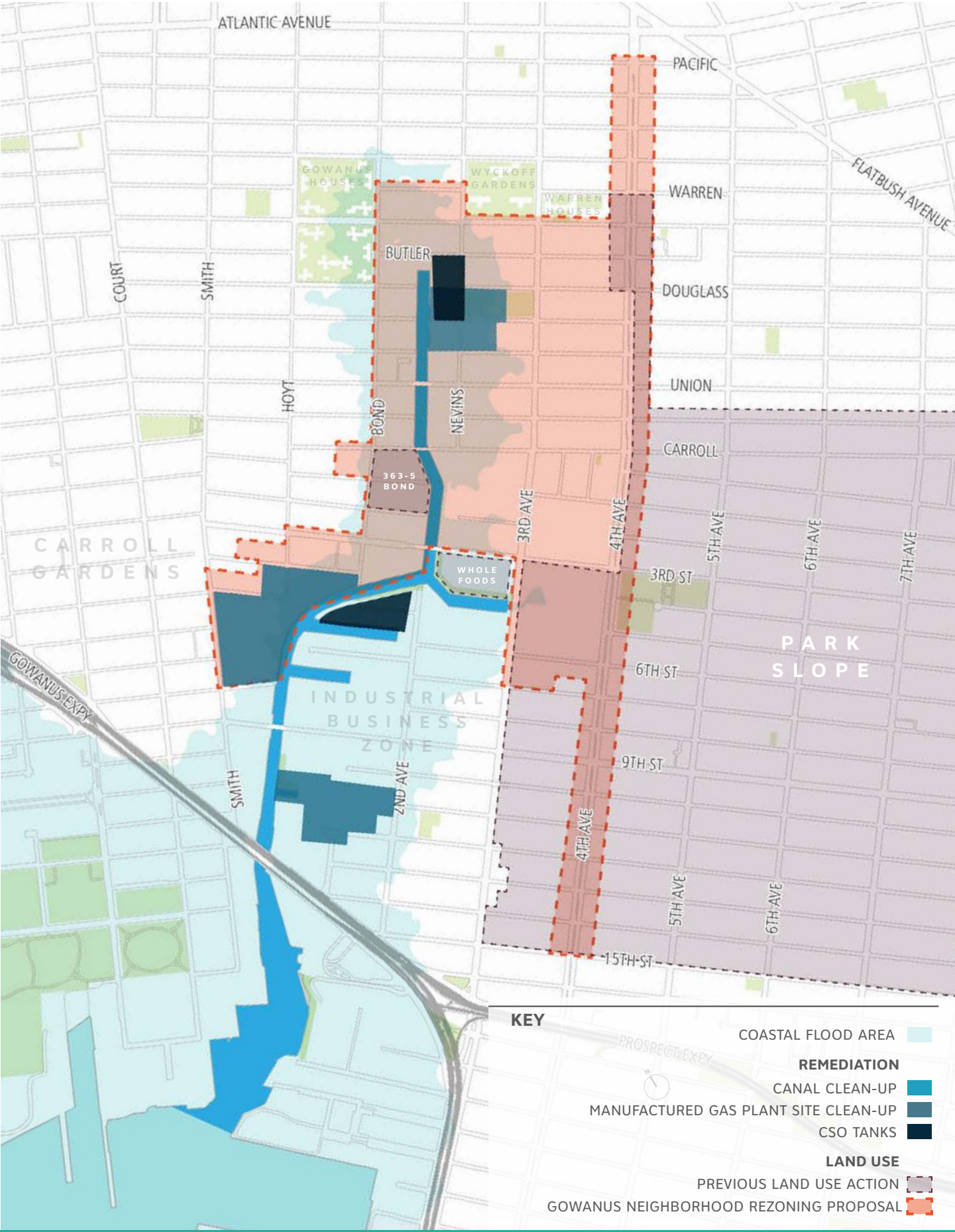
2019: DRAFT SCOPE OF WORK RELEASE

EXPECTED 2020: CERTIFICATION AND PUBLIC REVIEW



Map from Department of City Planning's Neighborhood Plan. Source: DCP

MAJOR ONGOING PROCESSES



EMERGING PARKS & PUBLIC SPACES

The major processes underway in Gowanus, including remediation and land use change, will result in an amalgamation of new public spaces crossing multiple property lines. Investments will create new public spaces on city-owned sites, improvements to existing city-owned parks, and public spaces on privately-owned individual properties. The Gowanus Lowlands Master Plan unites what would otherwise be fragmented public spaces into a cohesive vision that meets community needs.

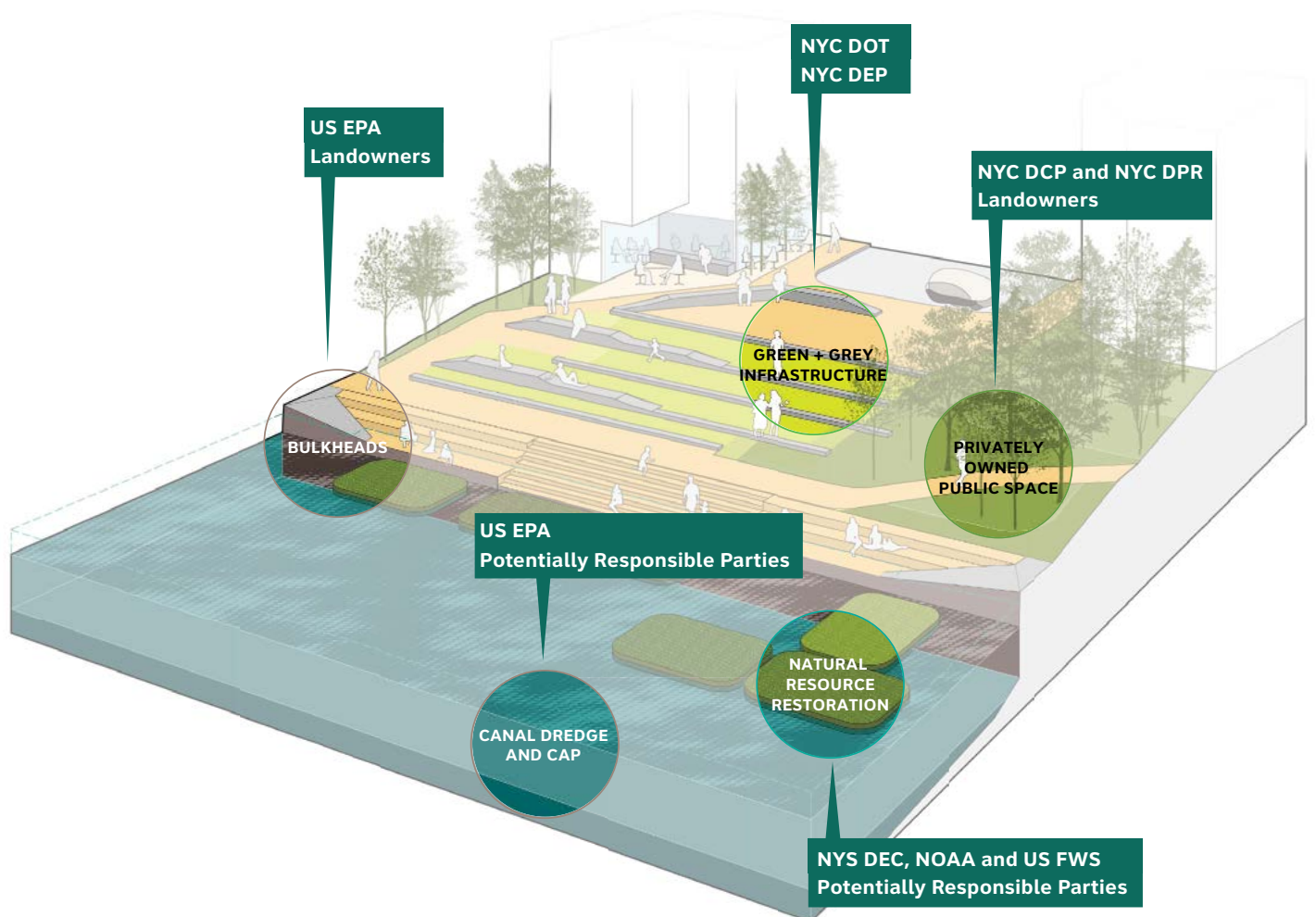
PRIVATELY-OWNED SITES

- Under waterfront zoning, new developments will be required to build Waterfront Public Access Areas (WPAAs), approximately 40' long strips of public open space on their property abutting the Canal.

CITY-OWNED SITES

- Public Place: The Department of Housing Preservation and Development (HPD) is working with a development team to create new affordable housing, a school, and a waterfront public park on this city-owned site.
- CSO tanks: The Department of Environmental Protection (DEP) is required to install two multi-million gallon detention tanks, which will include publicly accessible spaces. The Head of Canal Parks include public space on top of the future tanks as well as Thomas Greene Park, an existing park that is slated to be remediated. The other tank will be sited at the Salt Lot, located at the middle of the canal, which should include public access and interpretation.
- Additional underutilized parcels owned by the City and Metropolitan Transportation Authority (MTA), including Under the Tracks, the Transit Plaza, and Greenspace on 4th, should become public spaces.

PROCESSES AND RESPONSIBLE ENTITIES ALONG THE WATERFRONT





COMMUNITY OUTREACH

Since 2015, GCC has led a multi-year public planning process to develop the Gowanus Lowlands Master Plan. Outreach has included 13 public workshops in the neighborhoods around the canal and the formation of a Gowanus Lowlands Steering Committee made up of local stakeholders to guide the development of a community based vision.



Workshop at Gowanus Houses, 2015



Workshop at The Dredgers Boat House, 2018



Workshop at EXPO Gowanus, 2018

GOWANUS LOWLANDS STEERING COMMITTEE

ESTABLISHED 2017, 1-2 MEETINGS PER YEAR

Comprised of Gowanus residents, stakeholders, and community group representatives from diverse backgrounds and perspectives, the role of the Steering Committee is to help guide and inform the design, implementation, and outreach strategy for Gowanus Lowlands. The Steering Committee meets 1-2 times each year to review progress as well as advise on design and strategy.

2015-16 OUTREACH WORKSHOPS

6 WORKSHOPS

NORTH GOWANUS

In partnership with Fifth Avenue Committee
Gowanus Houses

PARK SLOPE

In partnership with Old Stone House, Park Slope Civic Council, and Forth on Fourth Avenue
Old Stone House

BUSINESS

In partnership with Gowanus Alliance

SOUTH GOWANUS

In partnership with Gowanus Alliance & Gowanus by Design

YOUTH FOCUS

Part of EXPO Gowanus, 2015
MS 51/ Washington Park

WATERFRONT FOCUS

365 Bond Esplanade

2015-16 OUTREACH FEEDBACK

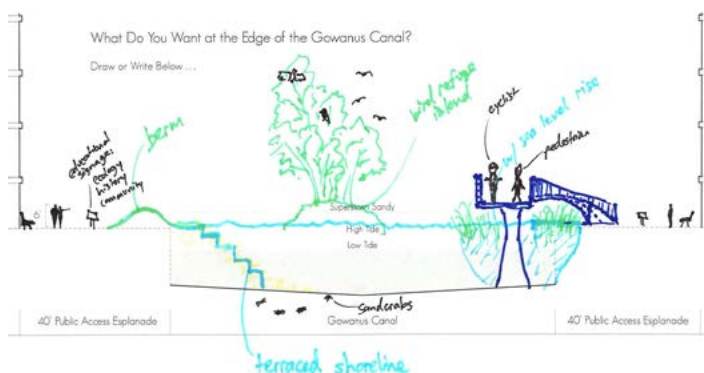
ACTIVITIES



Prompt: How do we use our existing public spaces?



Prompt: What activities and uses do we want to see? Where should these activities and uses go?



Prompt: What do you want to see at the edge of the Gowanus Canal?

MAJOR TAKEAWAYS

RIGHT-OF-WAYS AND CIRCULATION

People tend to use North-South Avenues more than East-West Streets, which were considered unwelcoming. Many proposed new pedestrian connections across the canal and a safe connection to the Brooklyn Greenway.

GREEN INFRASTRUCTURE

Participants identified flooding as a major issue around the canal and along 4th Avenue. Many noted the need for green infrastructure that includes upland solutions and incentives on private land.

RECREATION AND GREEN SPACE

Outreach generated ideas for new kinds of public space including intergenerational spaces with activities for the elderly, play areas for teenagers and toddlers, tennis courts, skate parks, splash pads, sledding, BBQ areas, native plant gardens, and community farms.

MIXED USES

Participants emphasized that ground floor commercial uses are critical and should be focused along particular corridors. Many cited the need for art space.

WATER ACCESS

Participants pin-pointed key areas for water access and the need for accessibility for individuals with disabilities. Multiple locations were identified for boat launches.

ECOLOGY

Ecological ideas included reefs, platforms, marshes, oyster cages, stormwater treatment, and islands as habitat for birds, invertebrates, and fish in the canal and along its banks.

FACILITIES

Participants pointed to the need for public facilities such as restrooms and water fountains.

IMPROVEMENTS TO EXISTING PUBLIC SPACES

Participants pointed to needs at Washington Park (shade; passive exercise areas), Thomas Greene Park (water fountain) and NYCHA green spaces (site improvements, BBQ areas)

2018 OUTREACH WORKSHOPS



Workshop at EXPO Gowanus, 2018

7 WORKSHOPS

LOWER GOWANUS

In partnership with the 8th Street Block Association
American Legion

PARK SLOPE

In partnership with Old Stone House, Park Slope Civic Council, and Forth on Fourth Avenue
Old Stone House

ARTS FOCUS

In partnership with Arts Gowanus and Carnival of Connectivity. *JS Gallery*

RECREATION & ACCESS FOCUS

In partnership with the Gowanus Dredgers *Gowanus Dredgers Boathouse*

YOUTH, EDUCATION & COMMUNITY FOCUS

Part of EXPO Gowanus
Thomas Greene Park

DESIGN & PLANNING FOCUS

In partnership with ASLA-NY
The Salt Lot

NORTH GOWANUS

Fifth Avenue Committee, in partnership with Gowanus Neighborhood Coalition for Justice (GNCJ)
Fifth Avenue Committee

ACTIVITIES

534 PLAN COMMENTS



436 MOOD BOARDS COMMENTS



2018 OUTREACH FEEDBACK

MAJOR TAKEAWAYS



970 TOTAL COMMENTS

AESTHETICS

- Preserve historic and industrial Gowanus
- Create a vibrant and wild place

ART

- Provide inclusive arts programming
- Provide performance/performing arts spaces
- Support local artists through spaces for art making and viewing

CIRCULATION + ACCESS

- Provide additional pedestrian bridges
- Improve access at key points (Head of Canal, 9th St, connection to Red Hook)

HISTORY

- Interpret history through materials, artifacts, wayfinding, and building preservation

RECREATION + PROGRAMMING

- Enhance water access and boating along canal
- Provide active spaces: play space, dog run, basketball, skate park, swings
- Indoor programming and community space

GREEN INFRASTRUCTURE + ECOLOGY

- Build green infrastructure along streets, public spaces and buildings
- Provide soft edges and salt marsh restoration
- Preserve wild feel and use native plants

BUSINESS

- Require active ground floors throughout Gowanus
- Support Industrial Business Zone with investment in critical infrastructure and public space

HOW WE GOT HERE

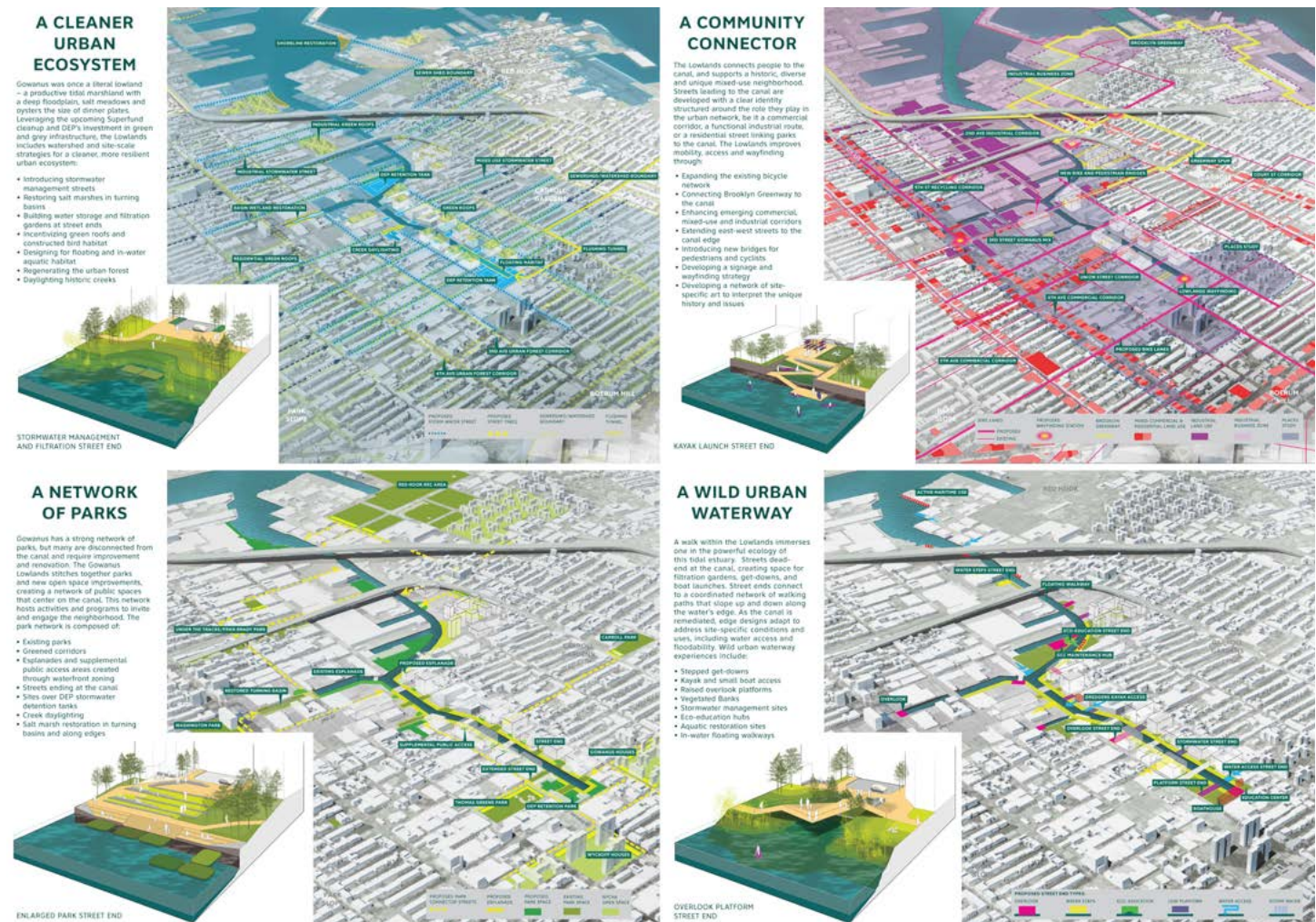
Over the last 13 years, Gowanus Canal Conservancy (GCC) has worked with agencies, elected officials, designers and the community to build, steward, and advocate for ecologically productive public space along the Canal.

2015-16: GOWANUS GREENSCAPE COMMUNITY VISION PROCESS

In 2015, GCC launched a community outreach and planning process for parks and public spaces along the Canal and within the Gowanus Watershed. This process engaged approximately 300 community members, partner organizations, landowners, elected officials, and agency representatives to identify open space priorities from a diverse range of neighborhood stakeholders. This outreach resulted in emerging concepts for elements such as right-of-ways and circulation, green infrastructure, recreation and passive space, programming, water access, facilities, and improvements to existing parks and green space.

2017: GOWANUS LOWLANDS BLUEPRINT

In 2017, GCC held an invited Request for Proposals and received 10 competitive proposals to coalesce, prioritize, and advance the ideas generated during stakeholder outreach. GCC hired SCAPE in March 2017. In June 2017, GCC and SCAPE released the Gowanus Lowlands Blueprint, a framework for the Lowlands Master Plan.



PROJECTED TIMELINE

ONGOING PROCESSES

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Policy	Rezoning by NYC Dept of City Planning											
	Natural Resource Damages Assessment by National Oceanic and Atmospheric Administration, US Fish and Wildlife Service & NYS Department of Environmental Conservation											
Construction	Bulkhead Construction by individual landowners and PRP Group											
		Superfund Dredging by PRP Group										
			Esplanade Construction by individual landowners									
			Capital Projects by NYC from Neighborhood Development Fund									
			Streetscape Construction by individual landowners									
			Northern CSO Tank Construction by NYC Dept of Environmental Protection									
						Southern CSO Tank Construction by NYC Dept of Environmental Protection						
						Natural Restoration Projects by PRP Group						

GCC DESIGN & ADVOCACY

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Design & Planning	Rezoning Comments											
	Gowanus Lowlands Master Plan											
	Community Outreach											
Management & Programming	Develop Governance and Funding structure											
Advocacy for funding and implementation	Neighborhood Development Fund											
	Zoning Regulations											
	Natural Resource Damages Assessment											
		Participatory Budgeting, Capital Campaigns, Green Infrastructure Fund										
	Coordination with new development											
	Coordination with existing buildings											

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CAPITAL PROJECTS

The priority capital projects for the public realm below should be implemented through the Neighborhood Development Fund, the future Natural Resource Damages settlement, and/or ongoing discretionary funds.

NORTH CANAL

- 1 GOWANUS HOUSES CAMPUS
- 2 WYCKOFF GARDENS CAMPUS
- 3 WARREN STREET HOUSES CAMPUS
- 4 ENERGY FIELD STATION
- 5 HEAD OF CANAL WETLANDS
- 6 PUMP HOUSE
- 7 THOMAS GREENE PARK
- 8 EDUCATION BARGE
- 9 DEGRAW STREET PEDESTRIAN BRIDGE
- 10 HEAD OF CANAL PARK
- 11 GREENSPACE ON FOURTH EXTENSION

MID CANAL

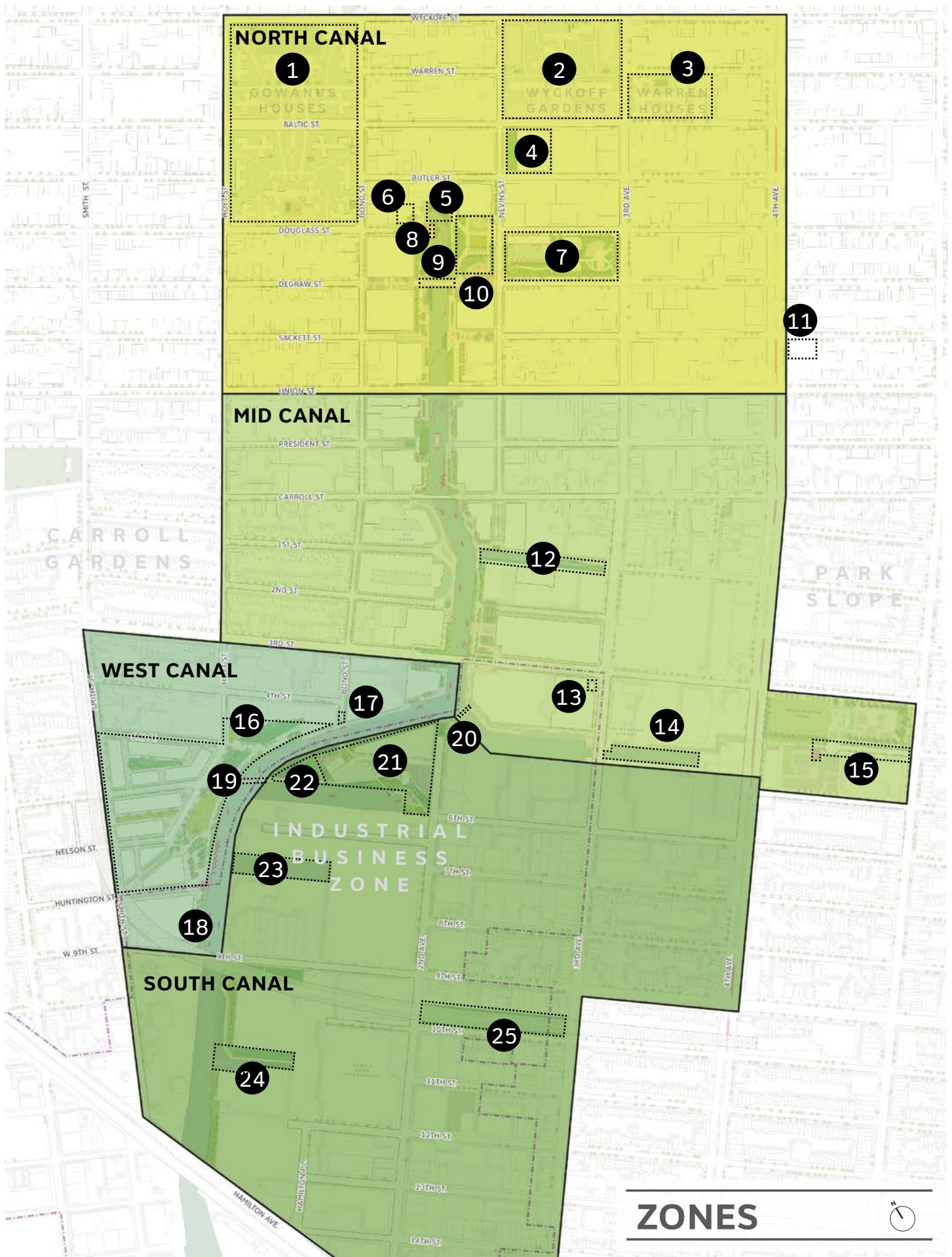
- 12 1ST STREET TURNING BASIN
- 13 THE COIGNET BUILDING
- 14 5TH STREET TURNING BASIN
- 15 OLD STONE HOUSE ANNEX

WEST CANAL

- 16 PUBLIC PLACE
- 17 BOND ST END
- 18 TRANSIT PLAZA AT 9TH ST

SOUTH CANAL

- 19 SALT LOT PEDESTRIAN BRIDGE
- 20 4TH ST TURNING BASIN PEDESTRIAN BRIDGE
- 21 SALT LOT
- 22 SALT LOT MARSH & 6TH STREET TURNING BASIN
- 23 7TH STREET TURNING BASIN
- 24 11TH STREET TURNING BASIN
- 25 FRAN BRADY / UNDER THE TRACKS



INTERPRETIVE NARRATIVES

1 PRESERVE NEIGHBORHOOD HISTORY & CHARACTER

- Maintain an archive of Gowanus artifacts and documents.
- Preserve historic landscape materials where possible.
- Incentivize adaptive reuse of historically significant or character defining structures.

2 INTERPRET AND SHOWCASE THIS CHARACTER

- Curate rotating exhibits and permanent displays of artifacts in indoor and outdoor spaces throughout the neighborhood.
- Use a collage of materials throughout the public realm that speak to the neighborhood's productive industrial history.
- Use a palette of plants throughout the public realm that speak to the neighborhood's vibrant ecological history, from salt marsh to farms to feral.
- Provide signage and wayfinding throughout the neighborhood that interpret neighborhood history, infrastructure, and community.

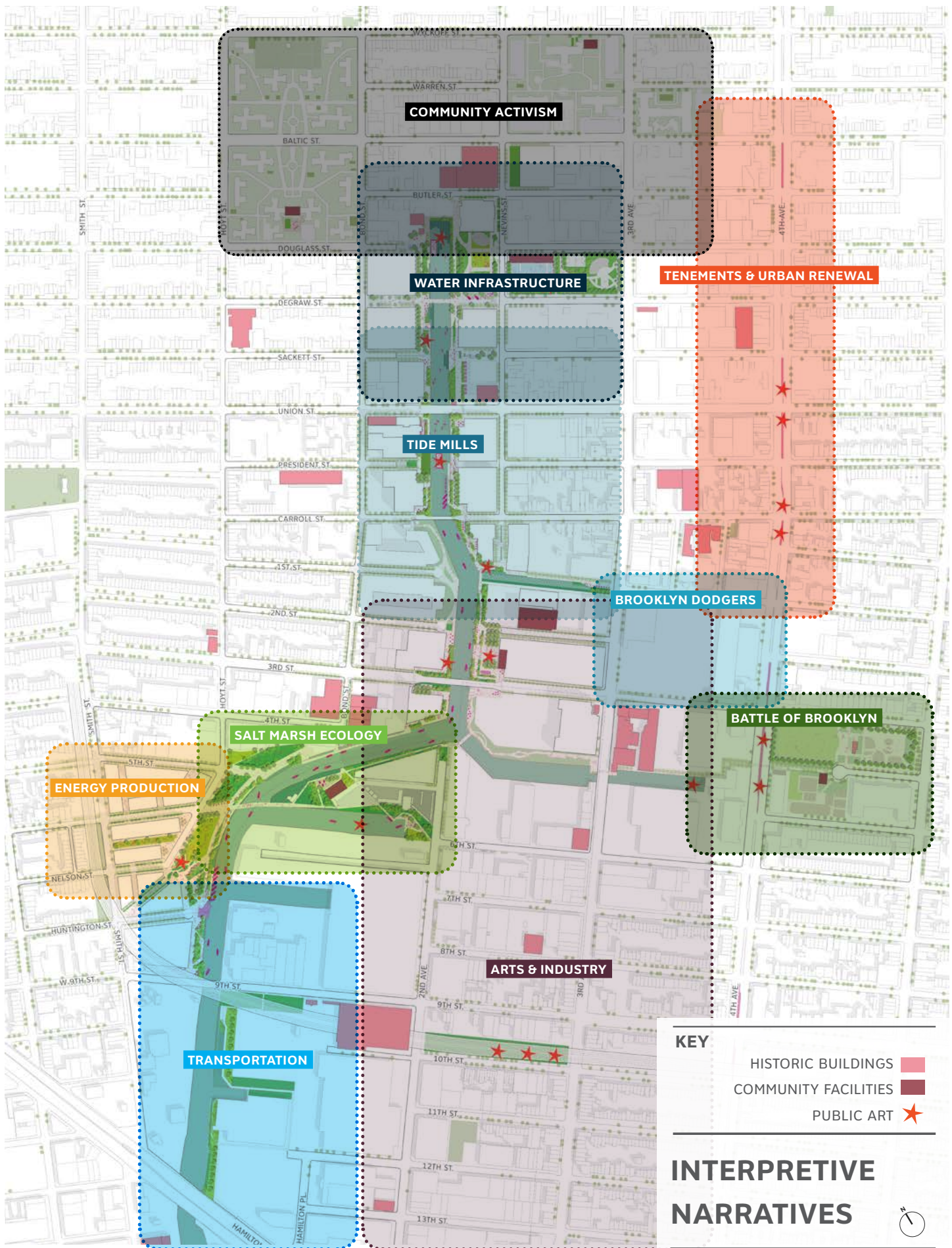
3 CURATE PUBLIC ART TO SHOWCASE LOCAL TALENT AND STORIES

- Produce public art installations that showcase local artists and/or interpret the history and culture of Gowanus.
- Promote the continuation of a vibrant arts community through accessible studio, exhibition, and market spaces.

4 SUPPORT DIVERSE, ENGAGING PROGRAMMING

- Support public programming and education that involves all residents of Gowanus and promotes social justice and community cohesion.



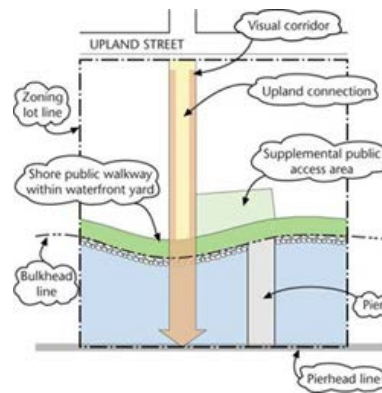


WATERFRONT ACCESS PLAN

New York City zoning requires all residential, commercial, and community facility developments on the waterfront to provide and maintain public open space. Along the Gowanus waterfront, these public spaces will be developed over time by multiple property owners.

Waterfront zoning requires a minimum 20% of each waterfront site be dedicated to public access through three main components:

1. Shore Public Walkway (SPWW)
2. Upland Connections
3. Supplemental Public Access Areas



Schematic of waterfront zoning requirements, Department of City Planning

As part of the Gowanus Rezoning, the City is developing a Gowanus Waterfront Access Plan (WAP), which will amend waterfront zoning to address Gowanus-specific conditions. The key recommendations for the WAP below celebrate the unique conditions and character of Gowanus, suggest programs and principles that align with community needs, and identify opportunities to promote better site design to promote the development of a vibrant, resilient, diverse, connective, and activated waterfront.

CREATE A CONTINUOUS PUBLIC PARK ALONG THE CANAL

- Require or incentivize the construction and maintenance of publicly-owned street ends, bridge easements and street plazas as extensions of shore public walkways, allowing for a continuous public park along the canal.
- Require or incentivize supplemental public space at bridge crossings and key corridors.
- Promote use of a collage of new and reused materials that speak to the unique industrial history of Gowanus.
- Adjust the lighting requirements to account for a narrow 2-sided waterbody, acknowledge the desire for dark skies in the community, and account for advances in lighting technology.

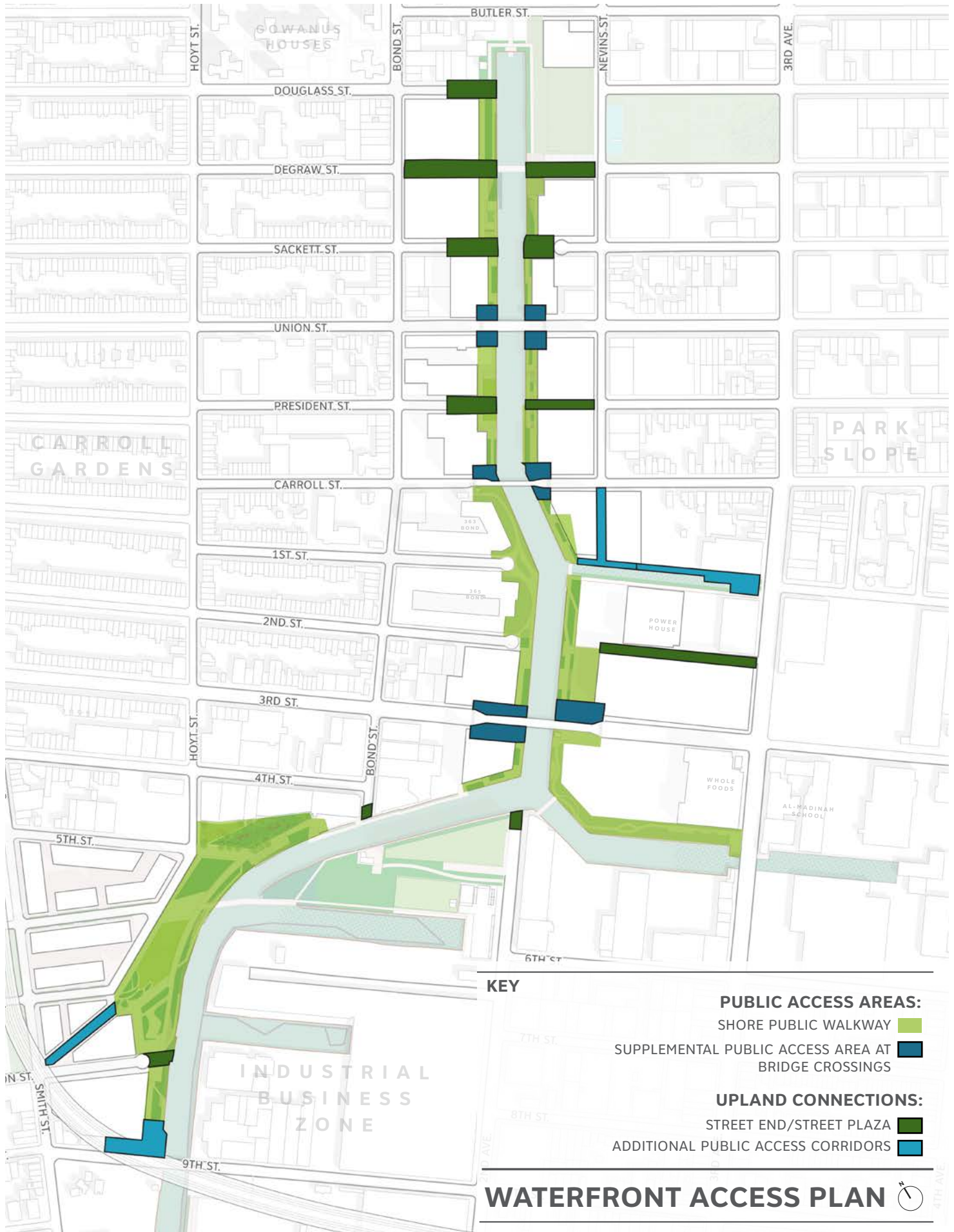
IMPROVE DRAINAGE AND RESILIENCY

- Promote diverse elevations across the waterfront.
- Allow plantings below boardwalks and below mean high tide to count towards planting requirement.
- Encourage native, drought-tolerant, and salt-tolerant plantings in all required plantings.
- Reduce lawn requirement for supplemental public access areas.
- Promote low bulkheads where possible to allow access, drainage, and habitat and for structural stability.
- Allow innovative stormwater techniques, such as wet swales, at the waterfront to count toward stormwater mitigation requirements for new development.

ENCOURAGE AN ACTIVE WATERFRONT

- Incentivize program spaces, such as playgrounds, public art, boat launches, and active recreation, within the entirety of the shore public walkway.
- Include a provision that requires or facilitates community-driven programming in privately-owned public spaces.

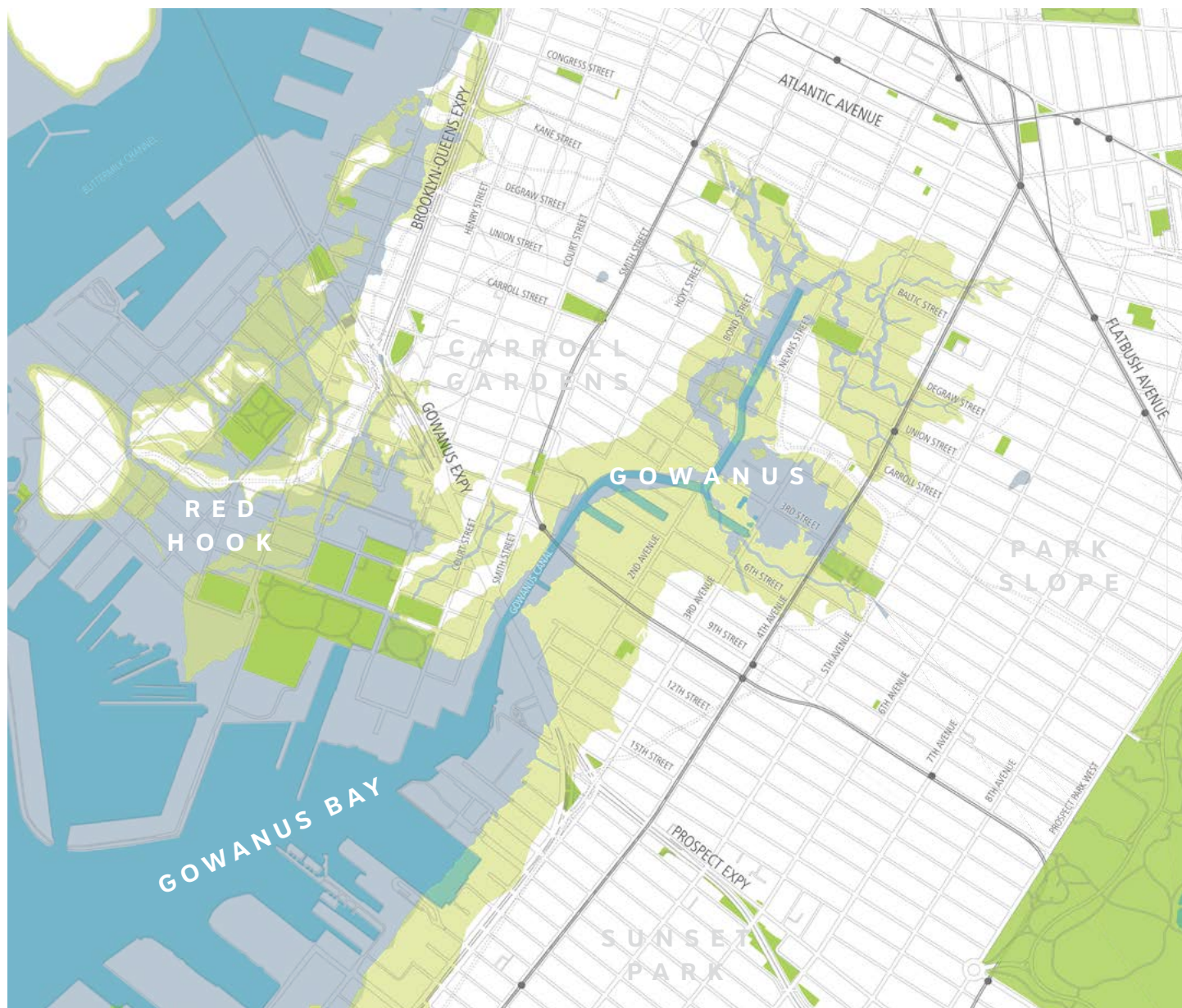
See more detail on text recommendations in "GCC Gowanus Waterfront Access Plan Recommendations"



NATURAL RESOURCE RESTORATION PROJECTS

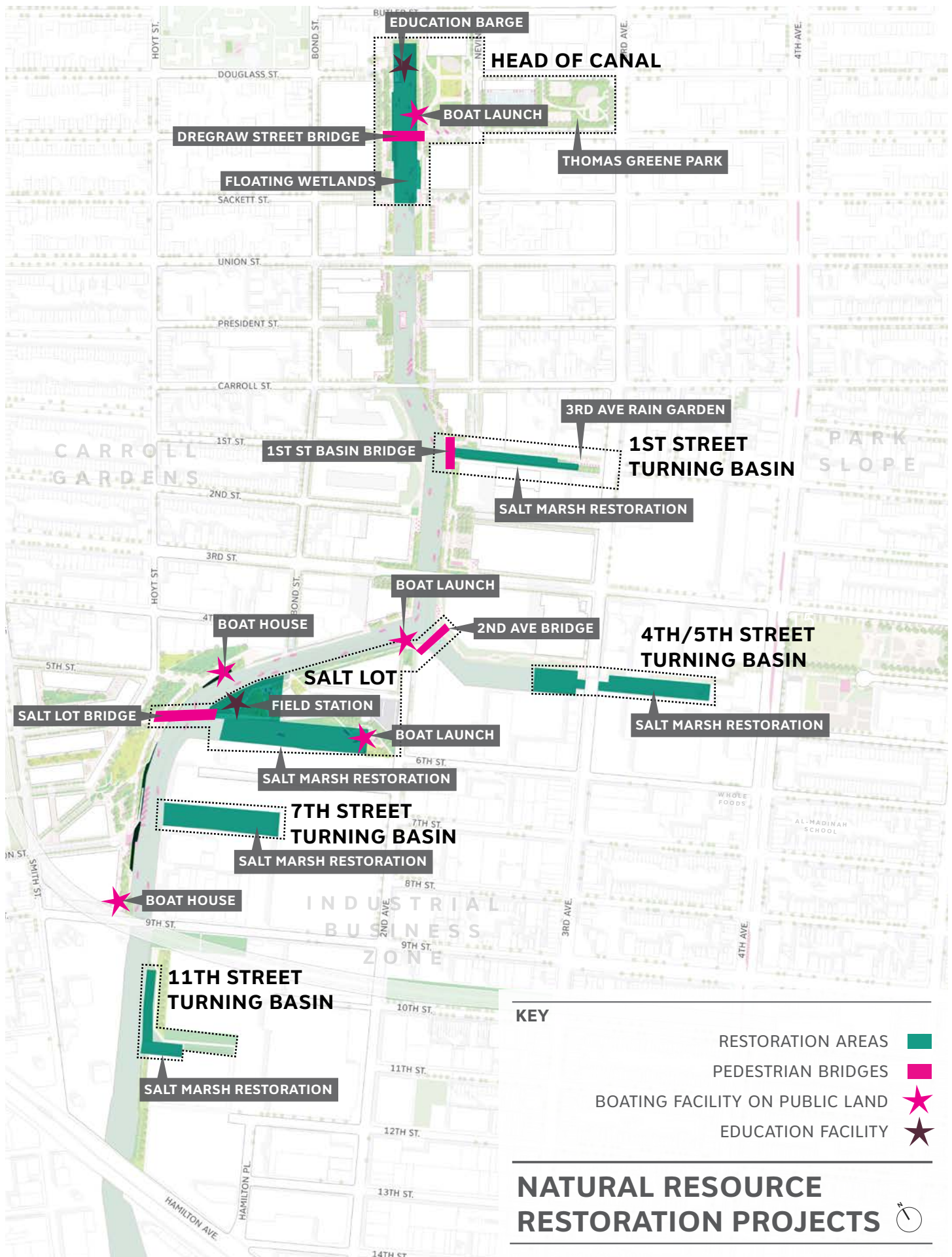
Under the Superfund, the Natural Resource Damages settlement will provide funding for projects that restore ecosystem services that have been damaged through the contamination or clean-up.

There are opportunities for larger scale habitat restoration in Gowanus Bay, but it is imperative that every effort is made to situate restoration projects within the rapidly-changing canal itself. Restoration projects in and on the banks of the canal can improve stormwater management, provide habitat, and provide much needed public access. These projects will directly benefit the communities that have lived for years adjacent to persistent contamination.



KEY

- HISTORIC SALT MARSH
- HISTORIC WATERWAY
- EXISTING PARK
- EXISTING WATERWAY





NORTH CANAL



The North Canal is home to a diverse and engaged residential community, a complex of NYC Department of Environmental Protection (DEP) sewer infrastructure, and the first Remedial Target Area (RTA) for the Superfund clean-up process. The North Canal community includes approximately 5,000 residents at 3 New York City Housing Authority (NYCHA) campuses: Gowanus Houses, Wyckoff Gardens, and Warren Street Houses. A critical site serving this community is Thomas Greene Park, the only large public park and community pool in the area and a former Manufactured Gas Plant (MGP) site that will be remediated in conjunction with the Superfund clean-up.

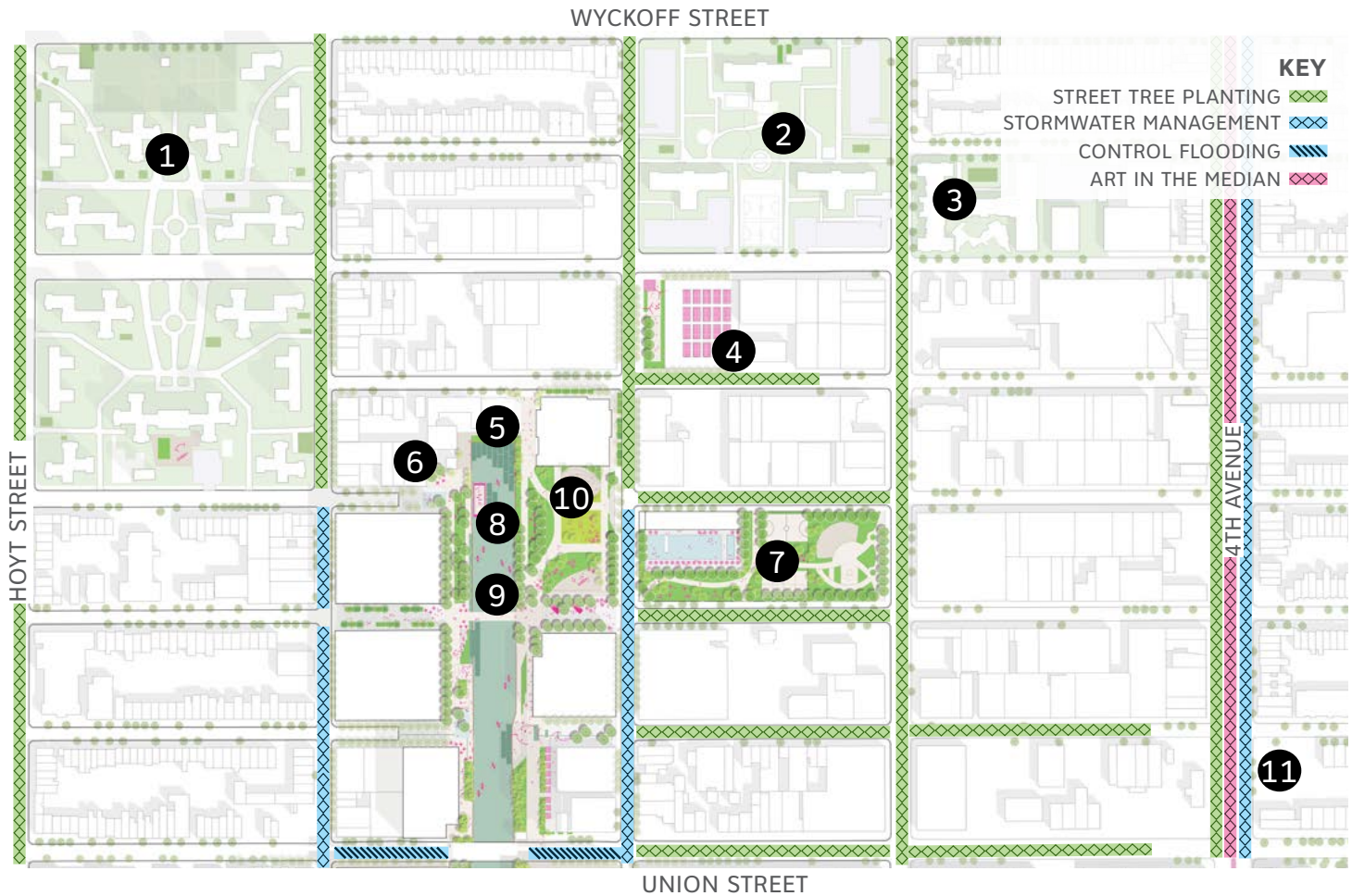
The North Canal faces both historic and ongoing pollution. The Head of Canal's combined sewer outfall discharges nearly 198 million-gallons of combined sewer overflow (CSO) annually. While the City has made substantial improvements to water infrastructure, including upgrades to the Pump House and rerouting of the Flushing Tunnel to increase freshwater flow in the canal, additional infrastructure investment is necessary to support existing residents and future growth.

As part of the Superfund remedy, the City will be required to build an 8-million gallon CSO storage tank near the Head of Canal. The project will include a headhouse facility and 1.6-acres of new parkland at the waterfront.

New investments should be leveraged to enhance the public realm and support the existing community through the creation of new and accessible community and park spaces; infrastructure and streetscape improvements; and funding for programming, maintenance, and job training.

NORTH CANAL

PRIORITY SITES



INVEST IN PUBLIC HOUSING CAMPUSES AT GOWANUS HOUSES, WYCKOFF GARDENS & WARREN STREET HOUSES

- 1 GOWANUS HOUSES CAMPUS
- 2 WYCKOFF GARDENS CAMPUS
- 3 WARREN STREET HOUSES CAMPUS

CREATE EDUCATIONAL OPPORTUNITIES AND PUBLIC REALM IMPROVEMENTS AT THE CON EDISON SITE ACROSS FROM WYCKOFF

- 4 ENERGY FIELD STATION

ENHANCE AMENITIES AT THE RECONSTRUCTED THOMAS GREENE PARK AFTER REMEDIATION

- 7 THOMAS GREENE PARK

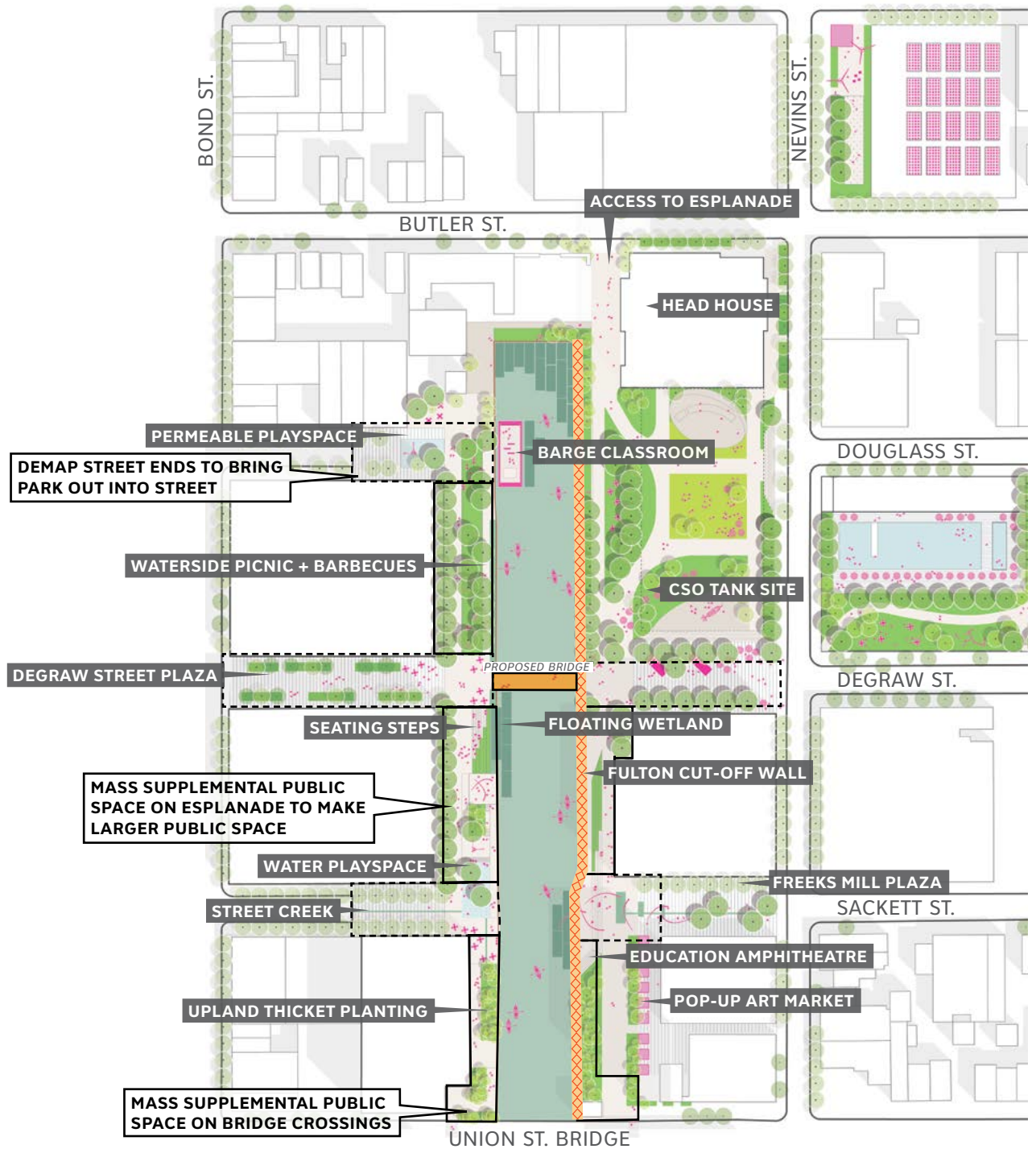
PROVIDE ACCESS, RECREATION, HABITAT AND EDUCATIONAL OPPORTUNITIES AT THE HEAD OF THE CANAL

- 5 HEAD OF CANAL WETLANDS
- 6 PUMP HOUSE
- 8 EDUCATION BARGE
- 9 DEGRAW STREET PEDESTRIAN BRIDGE
- 10 HEAD OF CANAL PARK

PROVIDE PUBLIC GREEN SPACE AT THE DEP-OWNED SITE ON FOURTH AVENUE

- 11 GREENSPACE ON FOURTH EXTENSION

WATERFRONT DESIGN & PROGRAMMING



KEY

SHORE PUBLIC WALKWAY

STREET PLAZA

FULTON CUTOFF WALL

PROPOSED BRIDGE

POLICY & DESIGN GUIDELINE

PROGRAM GUIDELINE

GOWANUS HOUSES

Critical repairs to buildings and apartment interiors must be funded in order to provide safe and decent housing for Gowanus Houses residents.

In addition to that work, the City and NYCHA should work to fund improvements to public space and ongoing community engagement in the public realm, as indicated below.

GOWANUS HOUSES NEEDS THEIR COMMUNITY CENTER

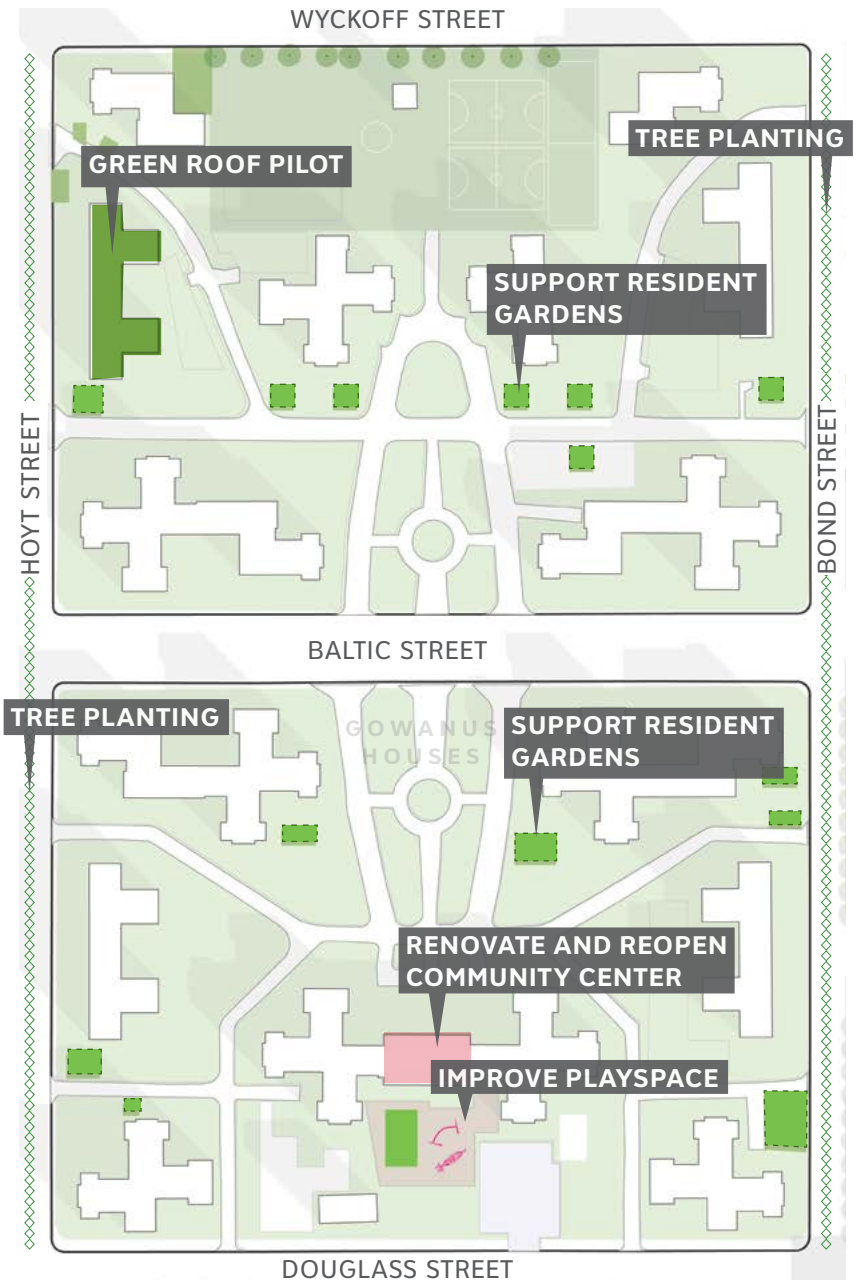


Gowanus Houses Community Center: The City must allocate sufficient funding to make necessary repairs. The City must also fund programming that is truly community-based, run in collaboration with residents, and responsive to residents' needs.

COMMUNITY GARDENERS NEED SUPPORT



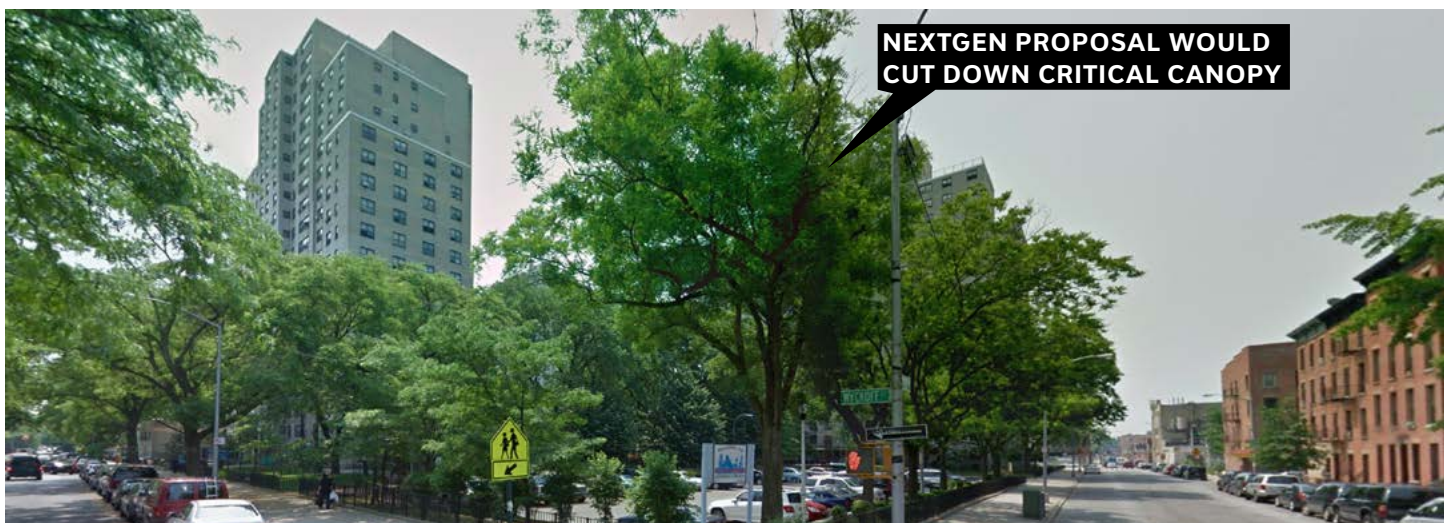
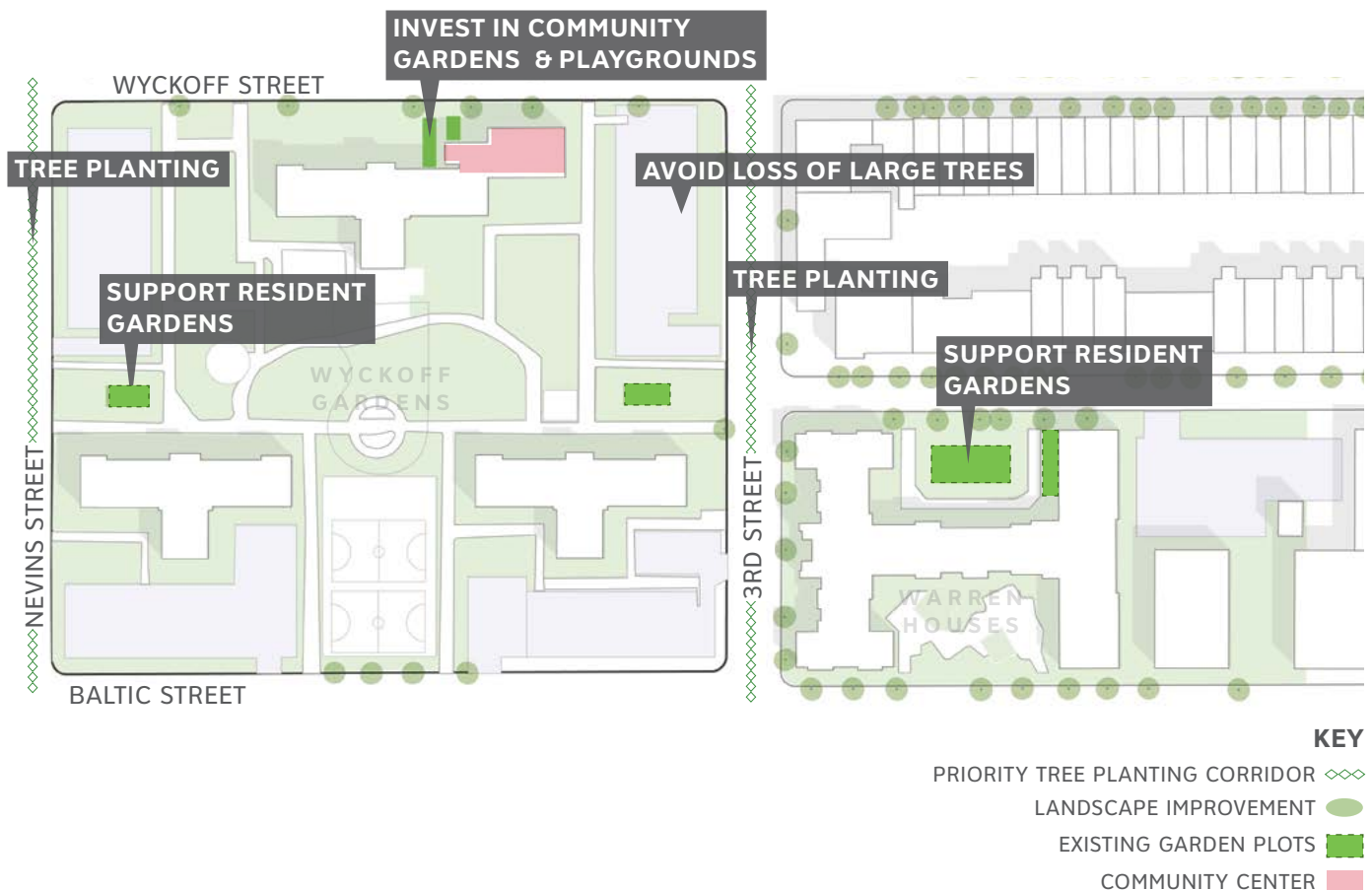
The soon-to-be-completed work under the Sandy Recovery funding has decimated community garden plots. These should be repaired, and funding should be provided for ongoing support of community gardeners.



WYCKOFF GARDENS & WARREN STREET HOUSES

Critical repairs to buildings and apartment interiors must be funded in order to provide safe and decent housing for Wyckoff Gardens and Warren Houses residents.

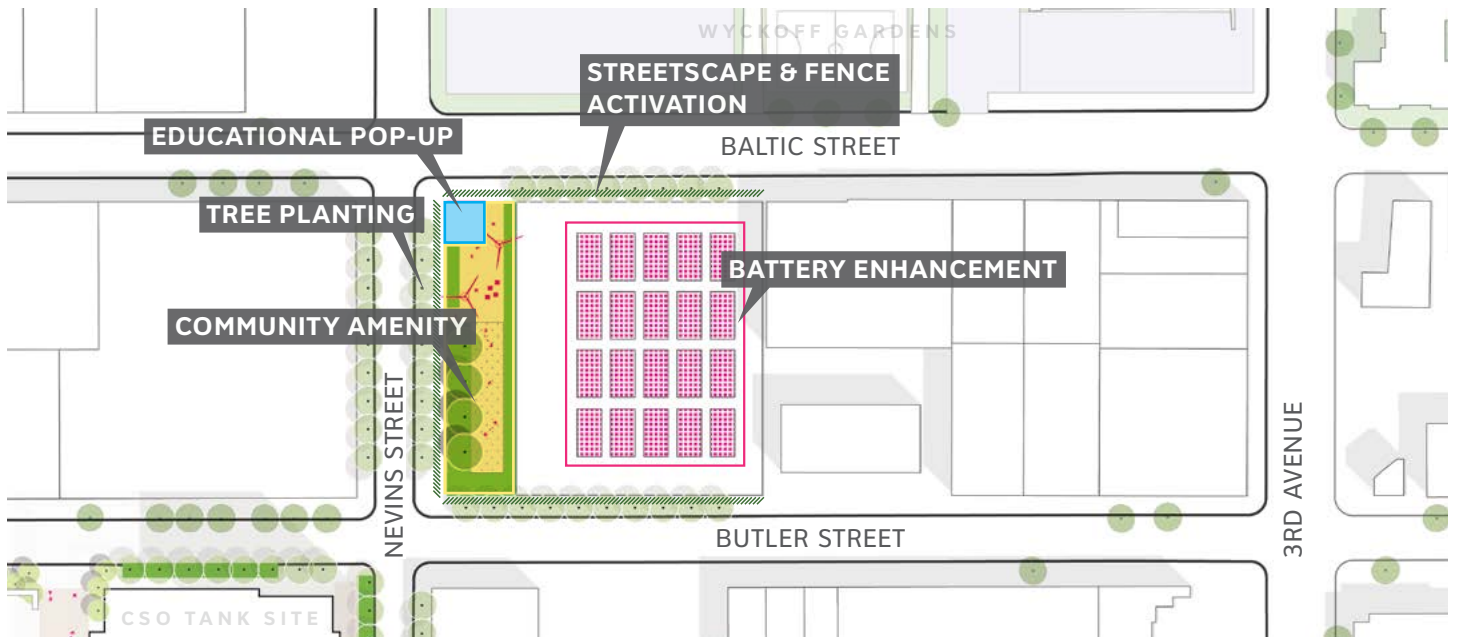
In addition to that work, the City and NYCHA should work to fund improvements to public space and ongoing community engagement in the public realm below. Additionally, existing NextGen proposal must be rethought to preserve the large canopy trees on the proposed site, which are some of the only large trees in the neighborhood.



Wyckoff Gardens, Corner Of Wyckoff Street And Nevins Street.

ENERGY FIELD STATION

The short-term use of the Con Edison lot at Baltic and Nevins Streets serves a critical energy need for battery storage in the neighborhood. At the same time, there is a need to activate the site edges in order to support the needs of adjacent residents. Con Edison should work with the City and community to provide short- and long-term site enhancements, such as those shown below.



BATTERY ARRAY (75' X 20') □

Activate the top and sides of batteries with attractive and multifunctional features.



Murals on sides and roof



Solar array on roof

EDUCATIONAL POP-UP □

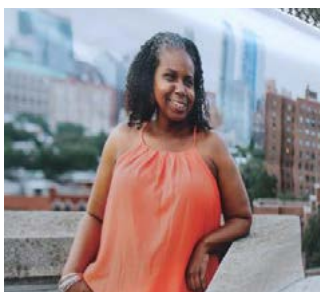
Provide community education about energy, the environment, and the neighborhood.



Mobile studios

STREETSCAPE / FENCE ▨

Activate the streetscape and fence with art, trees, shade, and areas for respite.



Community Heros exhibit



Planters

COMMUNITY AMENITY □

Provide short-term, low impact public space such as a dog park or pop-up skate park.

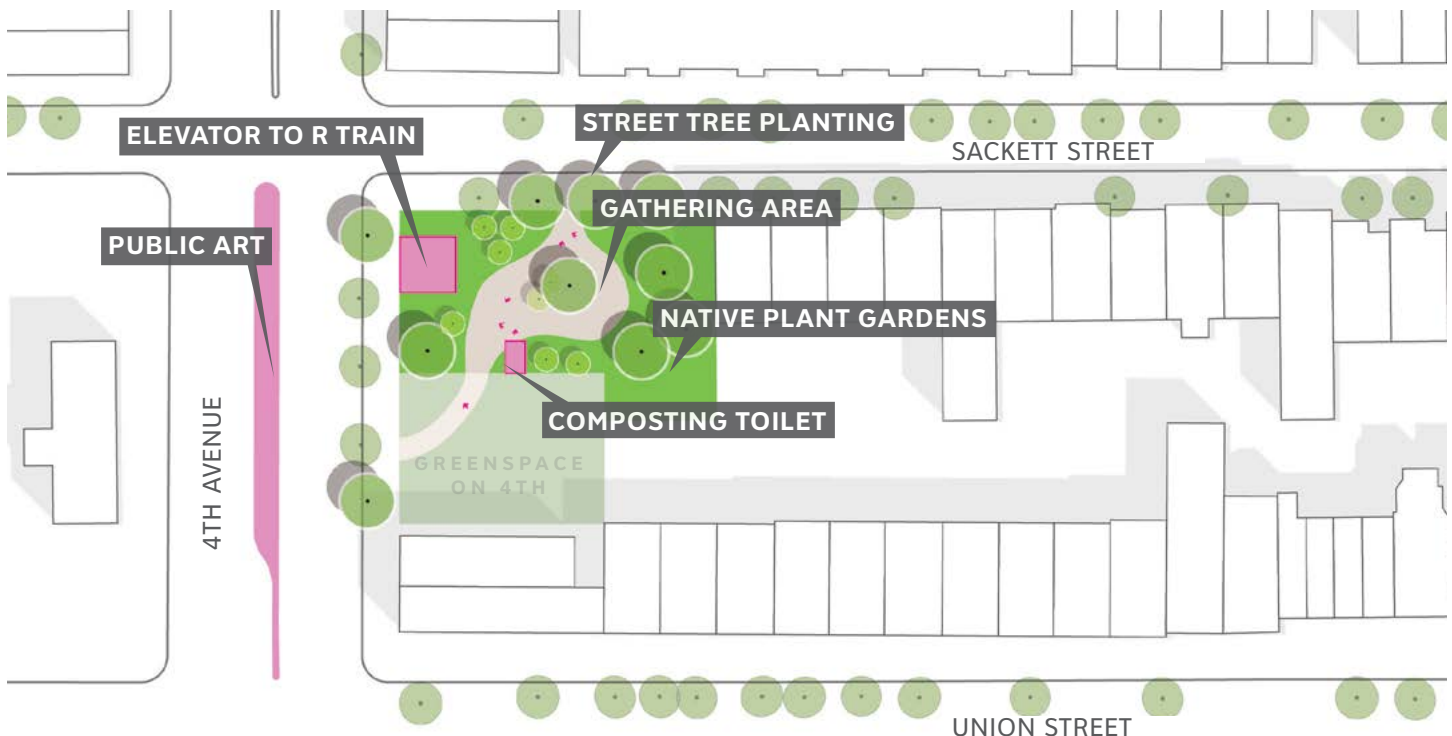


Pop-up sports

GREENSPACE ON 4TH EXTENSION

Greenspace on 4th, one of the few community gardens in Gowanus, is a welcome respite along busy 4th Avenue. Neighbors have built a rain harvesting system, a rain garden, and a composting program. There are beds full of native perennials that flower from spring to fall. There is a nursery area for growing new plants and leaf bins for autumn leaf collection. There is a bird garden providing water and dust to bathe in and feeders with bird seed.

This garden occupies a portion of a much larger lot owned by the City, and it is an access point for a DEP Water Tunnel. The entire lot should be developed into public space, extending the community garden into a larger native plant park with space for gathering, shade, and a composting comfort station. The site should also host an elevator connection to the northbound R Train at Union Street, a much needed accessibility investment for the growing neighborhood.



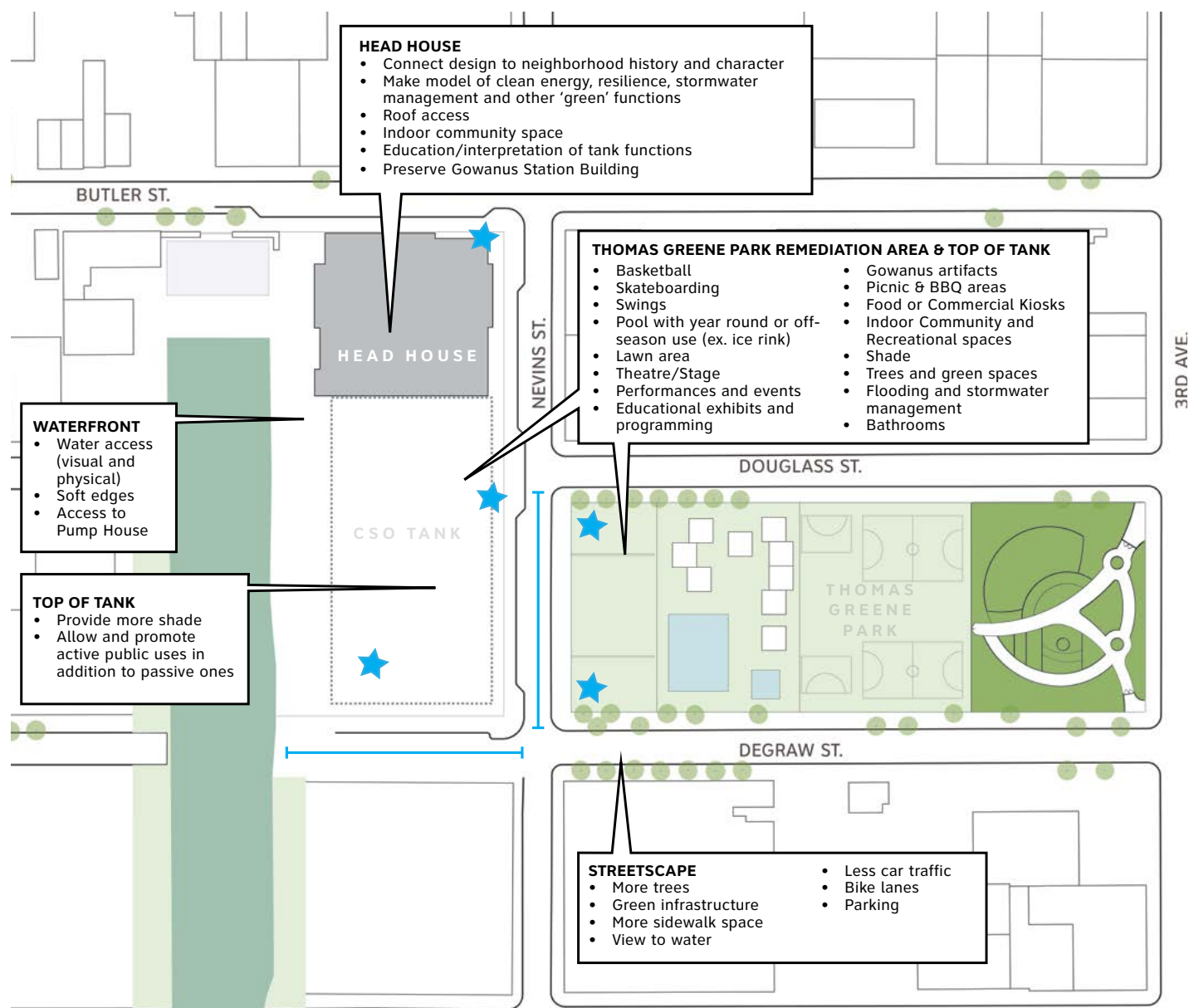
Volunteers mulch native plant beds



Neighbors rest in the shade

NORTH GOWANUS VISIONING

On July 25, 2018, a North Gowanus Visioning Meeting was held to gather community input for the future public space at the RH-034 CSO Facility and the remediated portion of Thomas Greene Park. Attendees included approximately 60 community members, local elected officials, City and Federal agency representatives, and utility representatives. DEP and EPA gave short presentations on planning, and participants broke into groups to discuss the projects. The map below summarizes the input from this meeting and informs the proposed designs on the following pages for the Head of Canal Park and Thomas Greene Park.



KEY

DESIGN SUGGESTIONS

POTENTIAL LOCATION FOR GOWANUS STATION FACADE ★

POTENTIAL STREET DEMAPPING OR CLOSURE —



Community stakeholders discuss impacts and opportunities from remediation and sewage management processes in North Gowanus.

HEAD OF CANAL PARK

Under the Superfund, DEP is required to build an 8 million gallon tank on 2 parcels at the head of the canal. The site plan will include a multi-story head house, a tank raised 5' above street level and a public park on top of the tank.

DESIGN & PROGRAMMING

While there are operational needs to consider on top of the tank, the site's large size presents an opportunity to meet the need for large program areas. The design should include a stage, skate park, large lawn, play area, and an accessible bathroom.

INTERPRETATION

Signage and site design should lead the public to the facility and interpret infrastructural elements and site history.

ACCESS

Access should be provided to the park from four sides:

- Butler Street: To the north, access from Butler Street should be accommodated outside of operational times.
- Nevins Street: To the east, a paving material change and potential raised street will improve safety and connect the Head of Canal Park to Thomas Greene Park across the street.
- Degraw Street: The Degraw street end should be turned into a pedestrian plaza with an area for food trucks and access to the tank from the south.
- Pedestrian Bridge: A pedestrian bridge should extend from Degraw Street to the west, providing connection to public space across the canal.



CURRENT PROGRAMMING EXAMPLES



Skateboarding during Gowanus Grind



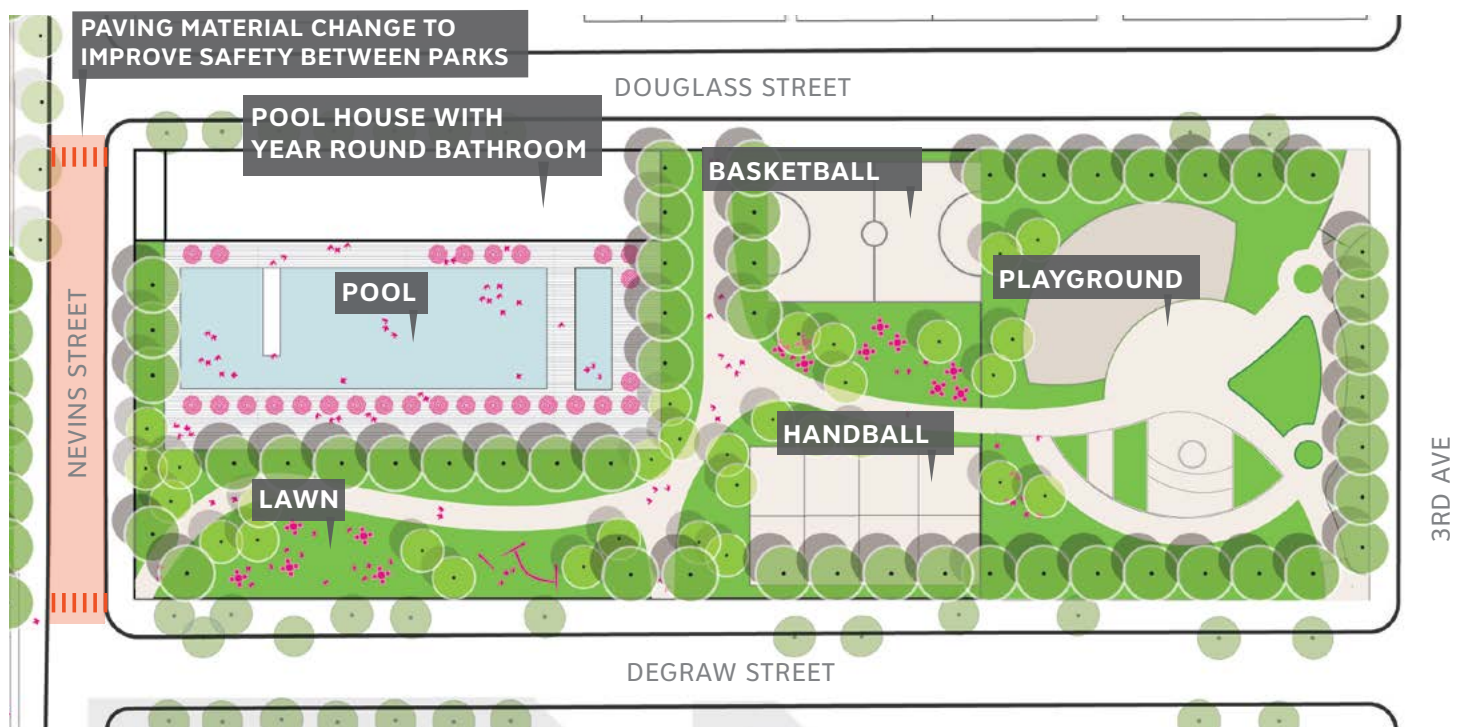
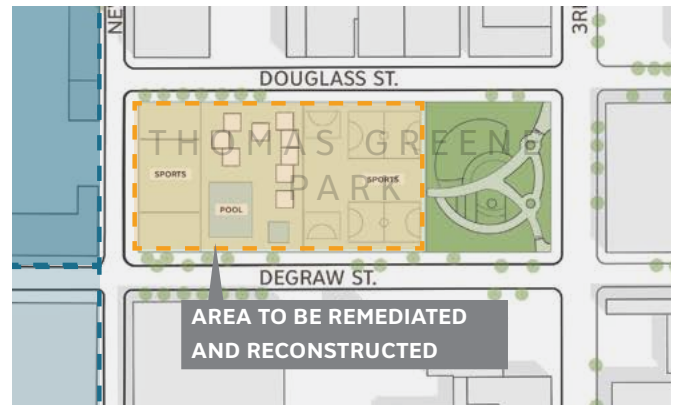
A Gowanus Wildcats performance

THOMAS GREENE PARK

Under an Administrative Settlement with the EPA, National Grid is required to remediate the western two thirds of Thomas Greene Park, within the footprint of the former Fulton Manufactured Gas Plant site. While National Grid will be required to replace the park in-kind, there is need for additional investment to create an urban park that meets community needs. Design should complement and connect to the Head of Canal Park across Nevins Street.

DESIGN & PROGRAMMING

Design elements include an expanded pool and pool house, additional plantings, and sports facilities.



CURRENT PROGRAMMING EXAMPLES



Swimming at the Douglass Degraw Pool



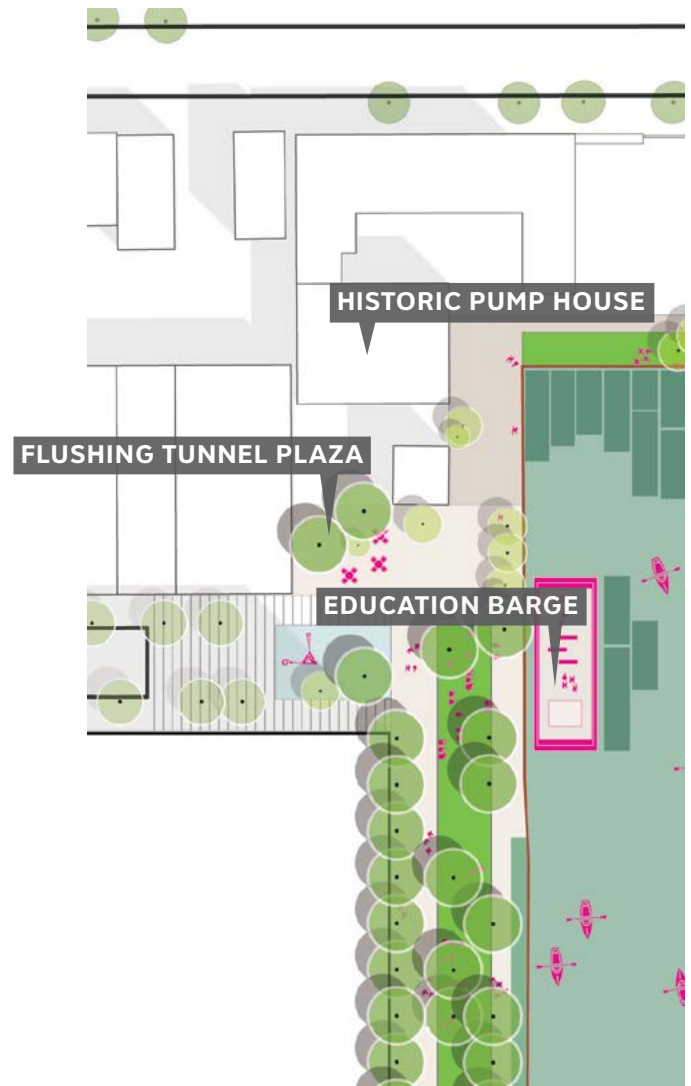
Stewardship in the gardens at Thomas Greene Park

PUMP HOUSE PLAZA

The City should invest in an educational space in the Pump House, in order to interpret the complex hydrological history and infrastructure in Gowanus, similar to the Visitor Center at the Newtown Creek Wastewater Treatment Plant.



Pump House existing condition: there is currently no public access to the pump house or the Head of Canal.



EDUCATION BARGE

An education barge at the Head of Canal will provide space for learning on the water. Educational programs should include ecology, water quality testing, and exhibits on urban infrastructural history.



Precedent: Swale Floating Food Forest, Source: Swale

DEGRAW STREET BRIDGE



A bridge across Degraw Street was a key priority raised during Gowanus Lowlands outreach. The bridge could be a fixed bridge, assuming the Union Street Bridge is fixed, but allow canoe and kayak access beneath.

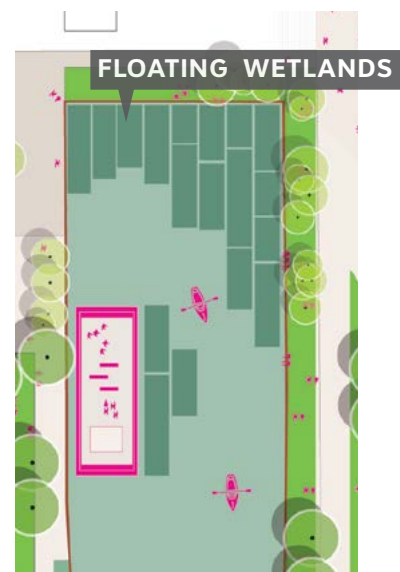
This bridge will provide pedestrian access across the canal, which will be especially critical when the top of the tank is closed for sewage tank maintenance and operations.



Fixed Bridge Precedent: Happy Hollow Park Bridge \$3.4M by Theodore Zoli /HNTB

HEAD OF CANAL WETLAND

Once the construction of the CSO tank and Superfund are complete, there is an opportunity to restore ecological function to the historically polluted area at the Head of Canal.





MID CANAL



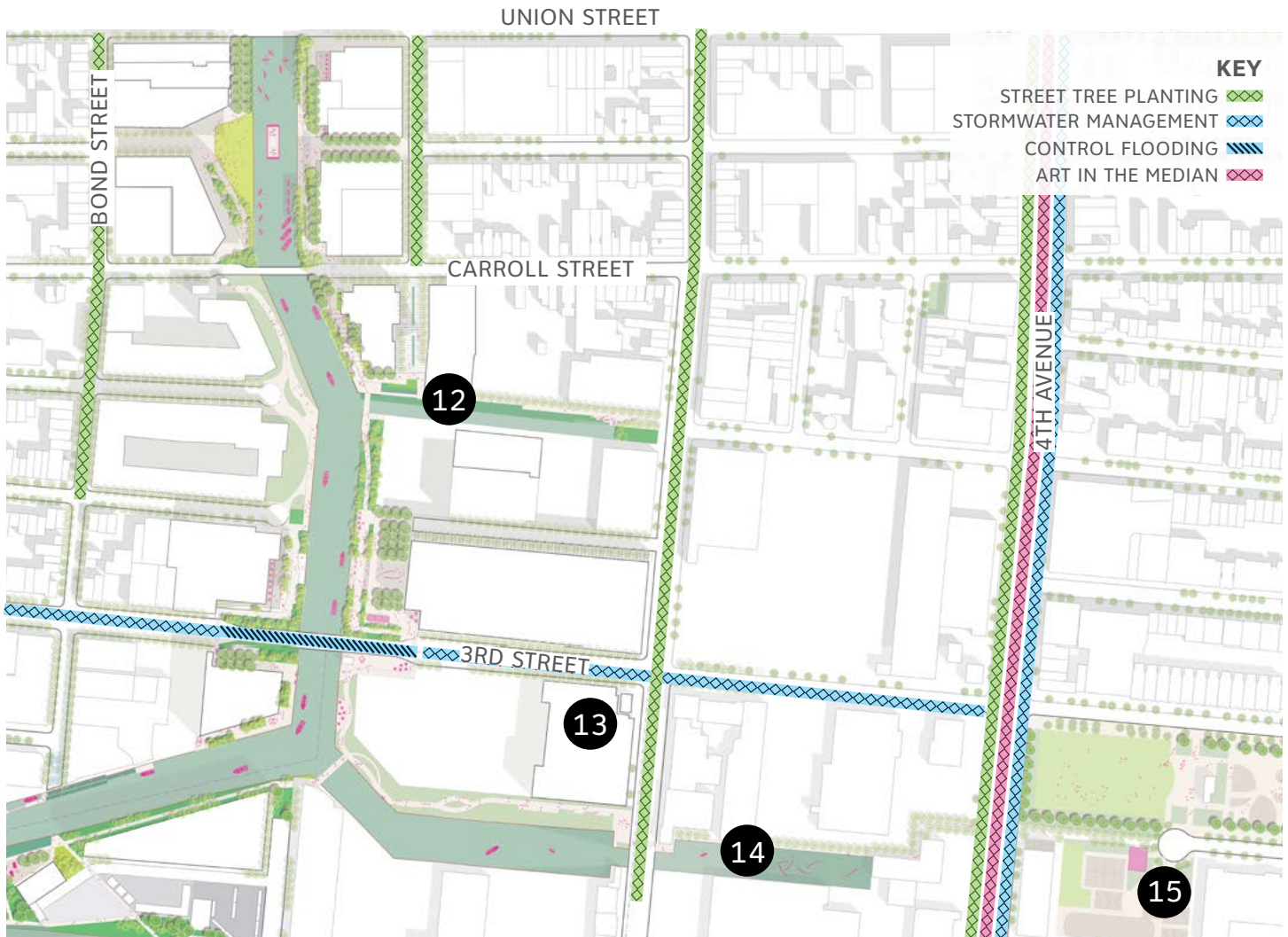
The Mid Canal is home to a number of historically relevant sites and is characterized by a mix of uses that include industrial businesses, artists and other makers, as well as a small residential community.

In 1776, the Battle of Brooklyn culminated at the site of the Old Stone House. Washington led 400 Marylanders against 2,000 British troops using the historic salt marsh in Gowanus to his advantage, allowing his troops to make their way to the East River. By 1880, this important site became the headquarters for the Brooklyn Dodgers baseball team until 1891 when the ballpark was demolished. A remnant wall from the former site still stands along 3rd Avenue. On a portion of this historic site sits Old Stone House & Washington Park, which provides recreation, education, and programming for the community.

Other key historic sites in the Mid Canal include the Carroll Street Bridge, the former Brooklyn Rapid Transit (BRT) Power Station now known as the Powerhouse, the Coignet Building, and the Old American Can Factory. These four sites are either existing city landmarks or calendared for designation.

Finally, the Mid Canal is also the site of the 363-365 Bond, the first residential development on the Gowanus Canal waterfront, highlighting the many challenges and opportunities associated with new development here.

The public realm in the Mid Canal should act as a gateway to the industrial business zone to the south, celebrating industry and showcasing the rich history of the neighborhood through wayfinding, interpretation, historic preservation, and ecological restoration. Opportunities for public realm improvements along 3rd and 4th Avenues that enhance multi-modal connectivity and respond to the historical and cultural narratives of Gowanus are further necessary to support this vision.



PROVIDE HABITAT RESTORATION, ACCESS, AND IMPROVED FLOW IN THE TURNING BASINS

- 12** 1ST STREET TURNING BASIN
- 14** 5TH STREET TURNING BASIN

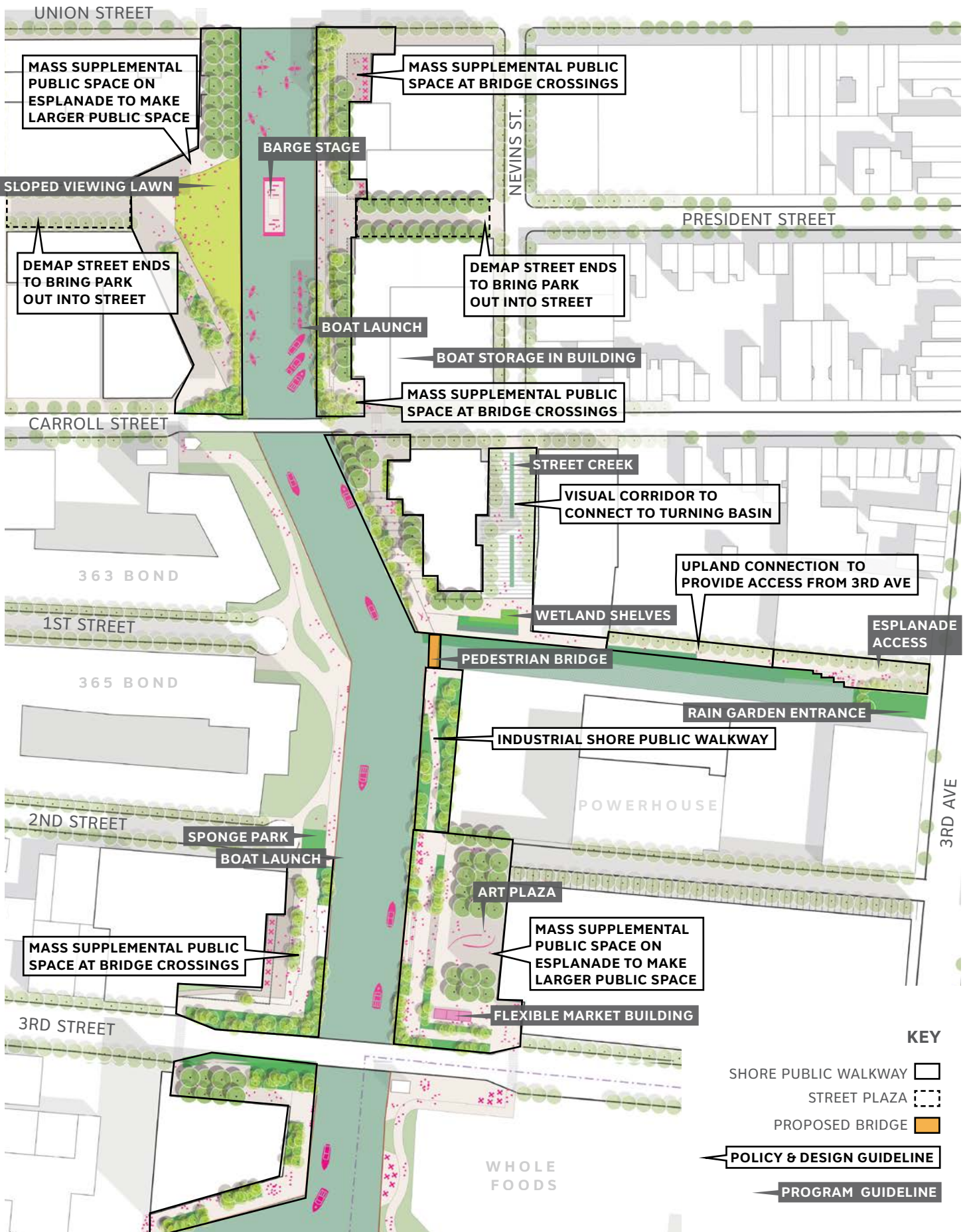
CREATE A MUSEUM THAT CELEBRATES THE INDUSTRIAL HISTORY, ARTS, AND ECOLOGY OF GOWANUS

- 13** THE COIGNET BUILDING

BUILD CAPACITY IN OLD STONE HOUSE & WASHINGTON PARK TO REACH MORE PEOPLE WITH PUBLIC PROGRAMMING

- 15** OLD STONE HOUSE ANNEX

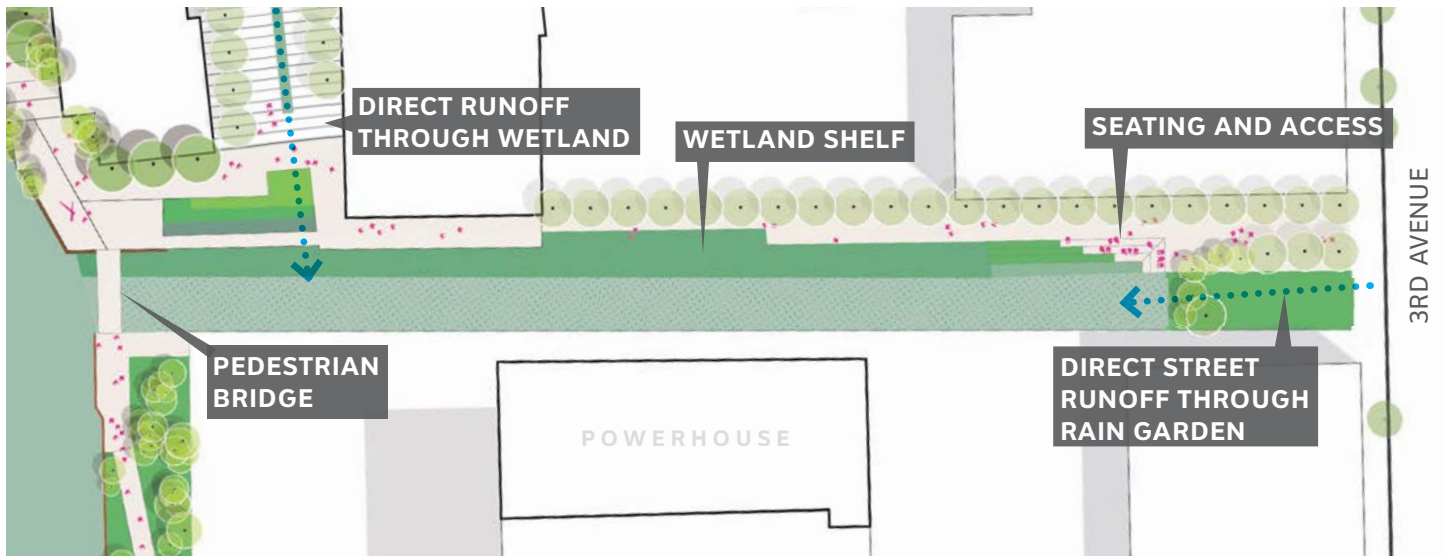
WATERFRONT DESIGN & PROGRAMMING



1ST STREET TURNING BASIN

As part of the Superfund, the City will be excavating and restoring the 1st Street Turning Basin, which was illegally filled in during the 1950s. The restoration, policy, and design for adjacent properties should include:

- Creation of adaptive edge and substrate that supports marine, low marsh, and high marsh ecologies
- Flow of fresh water, cleaned through green infrastructure, into turning basin to combat stagnation
- Connection of the waterfront esplanade through a pedestrian bridge
- Access from 3rd Ave and from Carroll St, through waterfront access requirements for new development

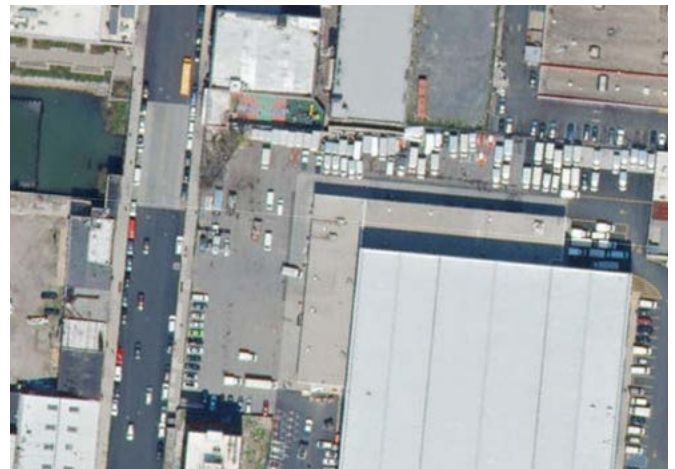
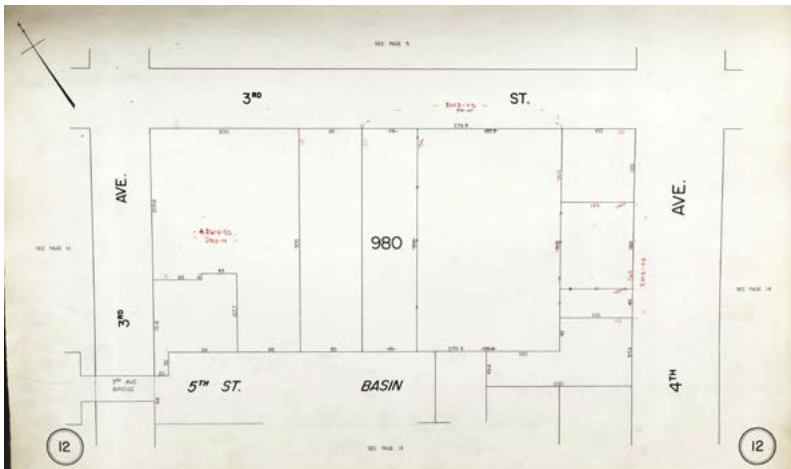
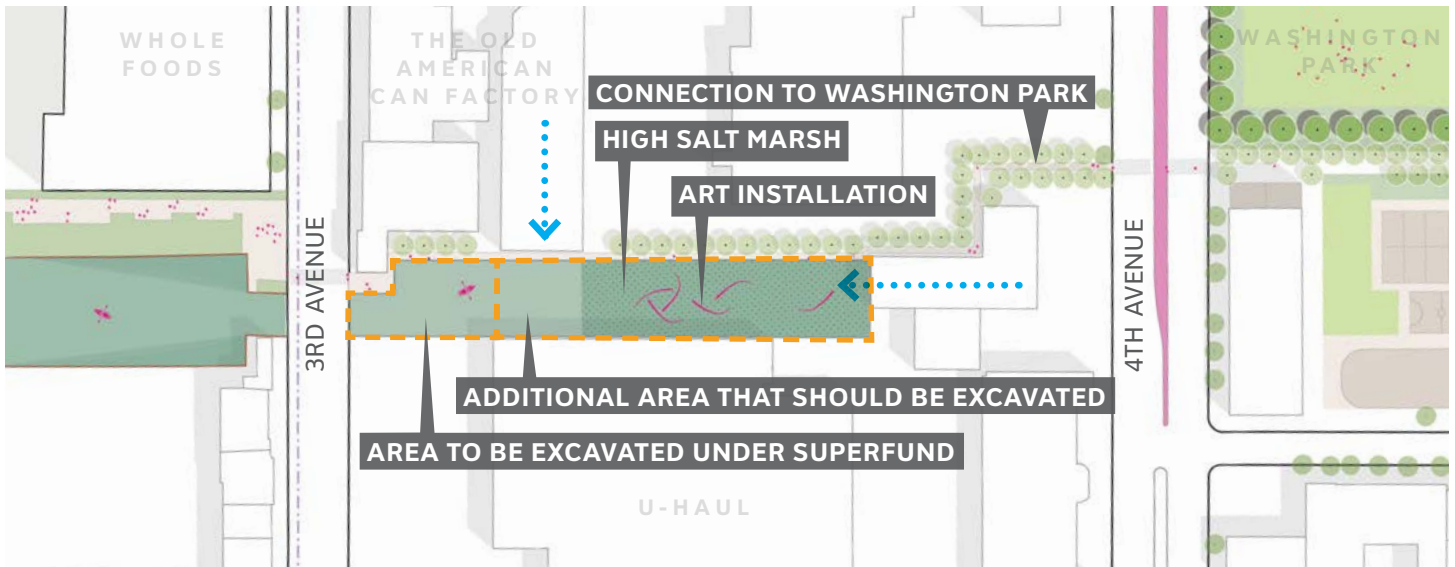


Rendering of potential 1st St Turning Basin Restoration, Chris Anderson, SUNY ESF MLA Capstone 2017

5TH STREET TURNING BASIN

The 5th Street Turning Basin was illegally filled in during the 1950s, and much of it is currently being used by U-Haul as a parking lot. As part of the Superfund, responsible parties will be excavating and restoring 100 feet of the Turning Basin. This restoration should be expanded to the full length of the historic turning basin and include:

- Creation of adaptive edge and substrate that supports low marsh and high marsh ecologies
- Flow of fresh water from roof drains of adjacent buildings into turning basin to combat stagnation.
- Connection to Old Stone House / Washington Park, through an easement negotiated with private landowners
- Site interpretation and public art, linking narratives of Salt Marsh, Battle of Brooklyn, and Gowanus industry



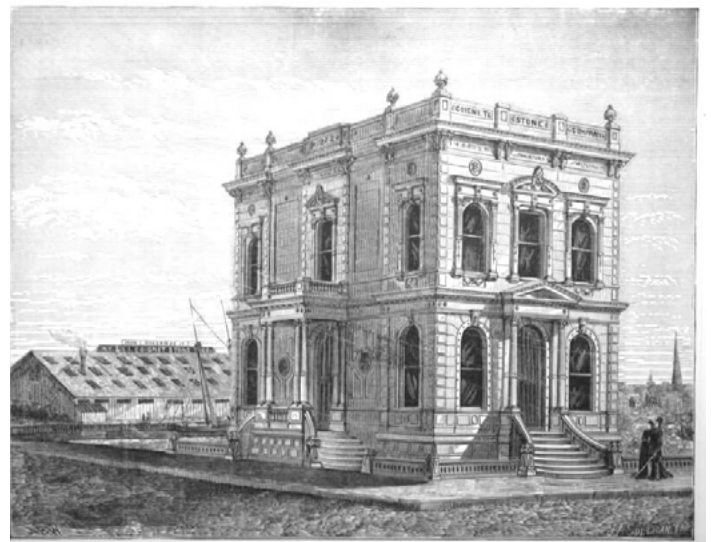
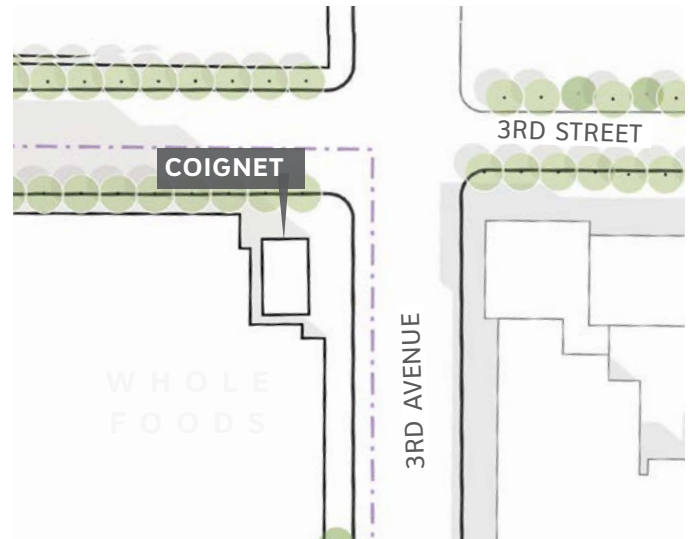
1956 NYC Tax Lot Map showing the historic extent of the 5th St Turning Basin Present day aerial

THE COIGNET BUILDING

The Coignet Building is the oldest known cast-in-place concrete structure in the City. Once a showroom for the New York & Long Island Coignet Stone Company, this landmarked building is a significant monument of the height of the industrial revolution and a particularly fitting center for the neighborhood which continues to have a strong concrete industry.

The building should be repurposed into the the Museum of Gowanus Industry & Art, a meeting point and a gateway to interpreting and celebrating the neighborhood. As a community and visitor center, this anchoring space should:

- House the Hall of Gowanus Archive - a gallery of artifacts, maps, and documents, curated by Proteus Gowanus, that celebrate the Gowanus Canal and surrounding neighborhood.
- Host annual artist residency to interpret the unique history and ecology of Gowanus.
- Act as a central interpretive public space with a visitor amenity hub potentially including information, refreshments, restrooms, and a multipurpose gathering space.
- Act as a gateway to the Industrial Business Zone, providing information and resources about area artists and businesses.



The Coignet Building, in the winter of 1872-1873



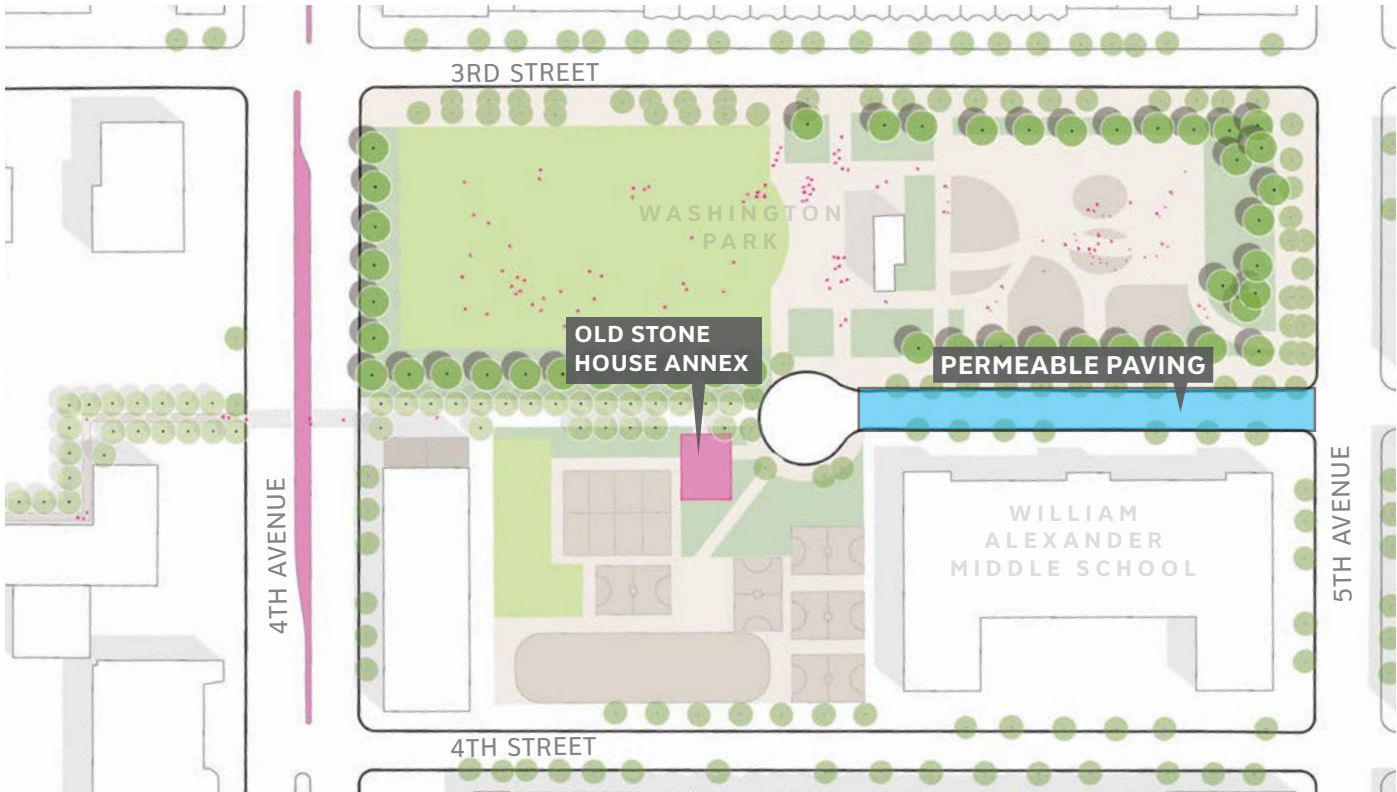
Hall of Gowanus, Proteus Gowanus



The Coignet Building, Reimagined as the Hall of Gowanus

OLD STONE HOUSE & WASHINGTON PARK

The Old Stone House & Washington Park are a historic site and park conservancy that provide interpretation, education programming, community facilities, and park space to the community. The Old Stone House Annex will increase visibility and access, provide educational exhibits and support additional programming at the site.



OLD STONE HOUSE ANNEX



- Support parks programming
- Flexible meeting space
- Increase capacity
- Increase the number of annual events

- Provide public bathrooms
- Create a stronger connection to 4th Ave
- Maximize indoor and outdoor space



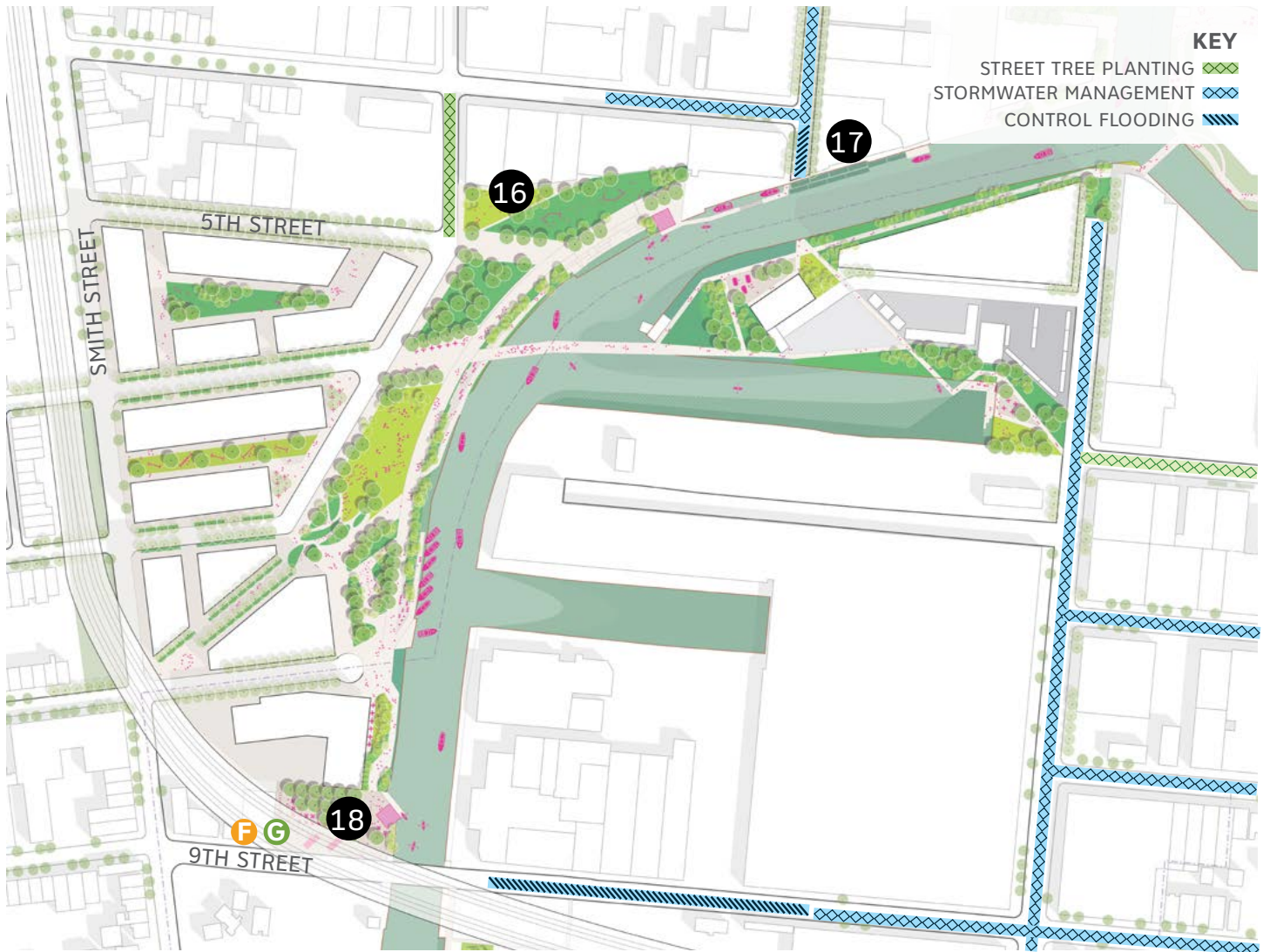
WEST CANAL



The West Canal is home to a vibrant mixed use area and is shaped by the elevated 9th Street Viaduct for the F and G trains, which curves at the Smith/9th Street Station

The majority of the West Canal Zone is comprised of Public Place, two adjoining parcels owned by the City of New York that span more than 6-acres at the Gowanus Canal waterfront. From the 1860s to the early 1960s, this site was home to the Citizen's Gas and Light Company and operated as a Manufactured Gas Plant (MGP) that used coal and petroleum products to create a flammable gas that supplied energy for cooking, lighting, and heating to the surrounding neighborhoods. The by-products of gas production generated a toxic liquid waste known as coal tar, the principal environmental contaminant present in the canal and on the site. In 1895, the plant was sold to Brooklyn Union, a predecessor of National Grid and gas production was decommissioned and facilities were demolished in the 1960s. The City took possession of the northern half of site in 1975 and designated it "Public Place" to allow a future public purpose. Remedial activities being performed by National Grid and overseen by the NYS Department of Environmental Conservation (DEC) began in 2019 and are slated for completion in 2021.

Public realm improvements in the West Canal should create a robustly programmed park on the Public Place site and convert a vacant MTA-owned site under the 9th Street viaduct into a Transit Plaza that connects the Smith/9th station to the waterfront esplanade to the north. Careful attention should be paid to supporting the small manufacturers and businesses in this area while addressing flooding and infrastructural issues.



CREATE A ROBUST WATERFRONT PARK AT PUBLIC PLACE

16 PUBLIC PLACE

IMPROVE FLOODING AND EDGE CONDITIONS AT THE BOND STREET END, WHILE MAINTAINING ACCESS TO INDUSTRIAL BUILDINGS

17 BOND STREET END

CREATE A TRANSIT PLAZA ON THE MTA PARCEL THAT ACTS AS A GATEWAY TO THE WATERFRONT ESPLANADE

18 TRANSIT PLAZA AT 9TH STREET

WATERFRONT DESIGN & PROGRAMMING



PUBLIC PLACE

Public Place is the largest city-owned site in Gowanus. In 2007, the NYC Department of Housing Preservation and Development (HPD) issued a Request for Proposals to develop the site for affordable housing; community facilities; commercial space; and open space along the canal. The City investment should ensure that the largest new public space planned for the Gowanus effectively serves the community's needs. The landscape should include safe and visible connections to St. Mary's Playground, interpretation of the site history, a public boat house and launch, play areas, and exemplary solutions for stormwater management and water reuse that minimize impact on the combined sewer system.



The Gas Holder at Citizen's Manufactured Gas Plant once loomed over the neighborhood. Photo from 5th St in 1924 - National Grid Archives

SITE INTERPRETATION



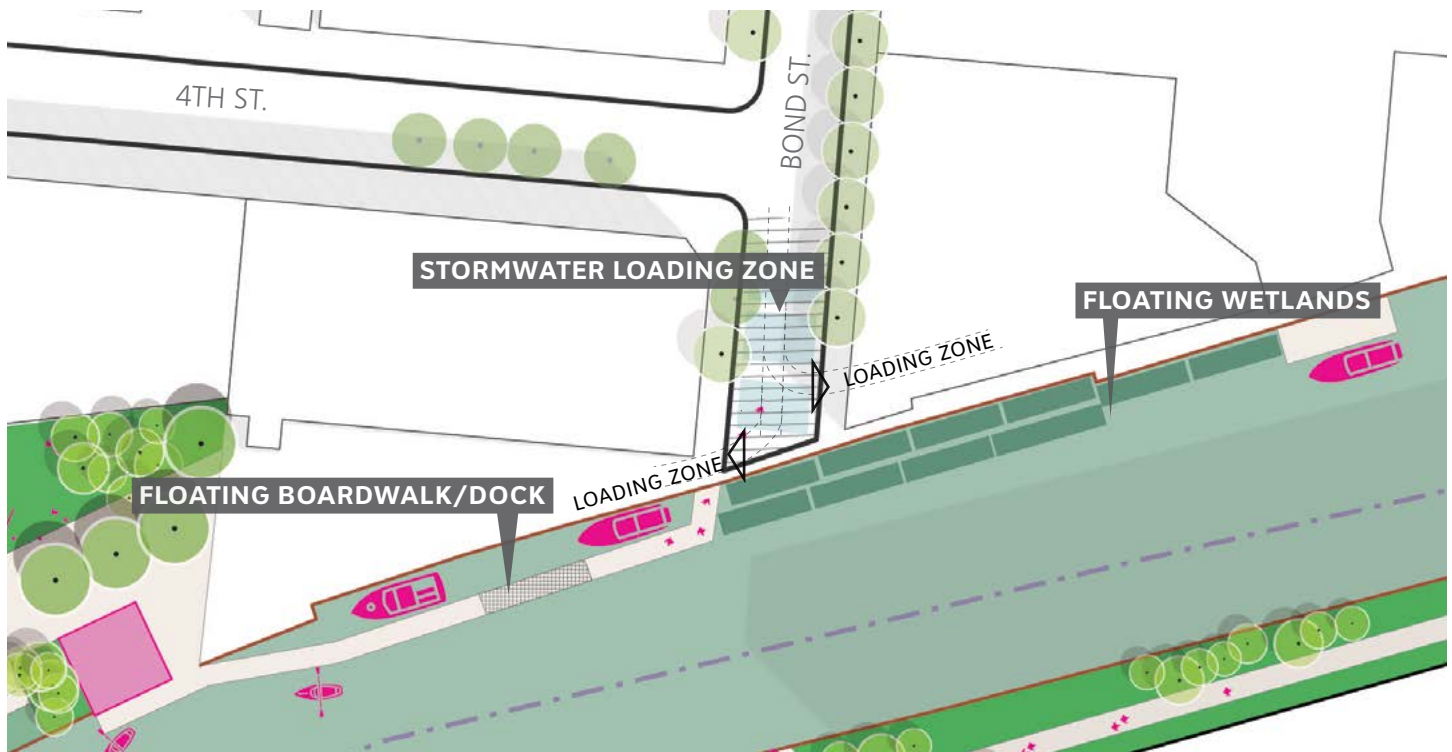
In 2013, Gowanus Canal Conservancy volunteers developed a series of large scale posters interpreting the history of Public Place and the larger area. Signage and public art should be used throughout the site to interpret the productive and dirty history of the site.



BOND STREET END

The Bond Street End regularly floods from both stormwater flowing down Bond Street and coastal flooding. It is also the loading zone for 3 buildings in a thriving industrial node that the City is looking to strengthen through the proposed zoning. This street end can be a model for sustainable industrial waterfronts and should include:

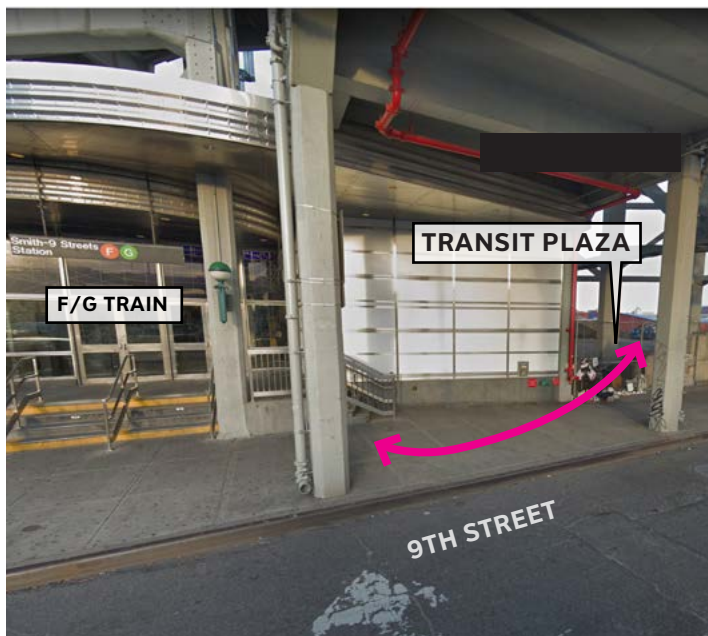
- Street end flood management with subgrade suspended paving or other green infrastructure technique that allows active loading while managing stormwater.
- Waterfront access through floating boardwalks and docks
- Bulkhead modifications to improve ecological function, including floating wetlands



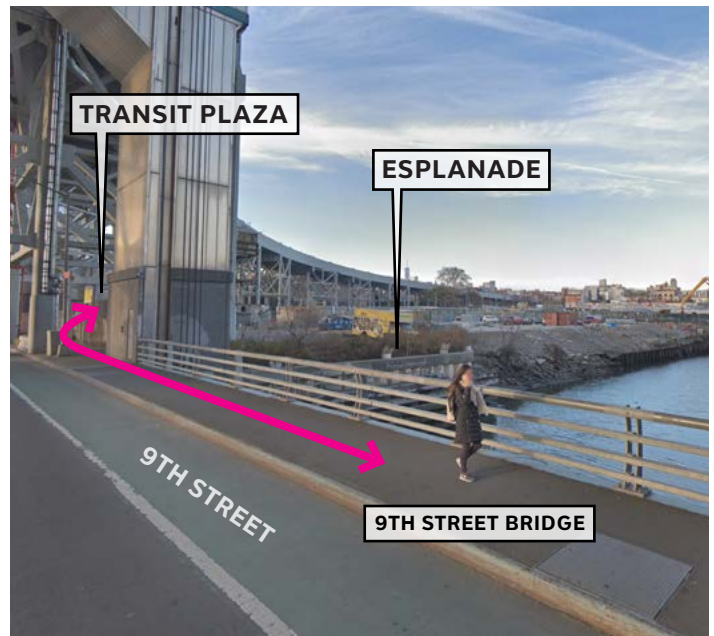
TRANSIT PLAZA AT 9TH STREET

The MTA-owned parcel on the northwest corner of the 9th Street Bridge should become a public plaza that provides clear and safe access from the shore public walkway to the train entrance, as well as provide bicycle parking, area for food trucks, and a public boathouse. The public plaza design should also include:

- Shade and seating
- Food vendors
- A public boathouse
- Potential site for ferry stop



Street view outside the MTA Smith and 9th Street Train Station





SOUTH CANAL



Industry is a significant part of the local economy in Gowanus and much of the land in the South Canal Zone will remain zoned for industry and manufacturing as part of the protected Industrial Business Zone (IBZ). Today, there are hundreds of thriving businesses in Gowanus, including concrete production, fuel storage, auto repair, woodworking, glassmaking, print design, and other craft work, that should be protected and maintained. The South Canal is also home to the Salt Lot, a Department of Sanitation (DSNY) salt facility that also includes a compost facility operated by Big Reuse and a plant nursery and stewardship hub operated by GCC. As part of the Superfund remedy, the City will be required to build a 4-million gallon CSO storage tank and headhouse facility on this site.

Industry should be supported in the IBZ through infrastructure and streetscape improvements that increase tree canopy and address flooding, while accommodating loading and truck traffic. The connection to Red Hook should be addressed with pedestrian improvements and a safe link to the Brooklyn Greenway. The Salt Lot and future CSO tank site should be enhanced with expanded eco-industrial uses, public space, and salt marsh restoration.

SOUTH CANAL

PRIORITY SITES



CREATE AN EXPANDED SALT LOT WITH PUBLIC SPACE, ECOLOGY, JOB TRAINING, AND IMPROVED ACCESS

- 19** SALT LOT PEDESTRIAN BRIDGE
- 20** 4TH ST TURNING BASIN PEDESTRIAN BRIDGE
- 21** SALT LOT
- 22** SALT LOT MARSH & 6TH STREET TURNING BASIN

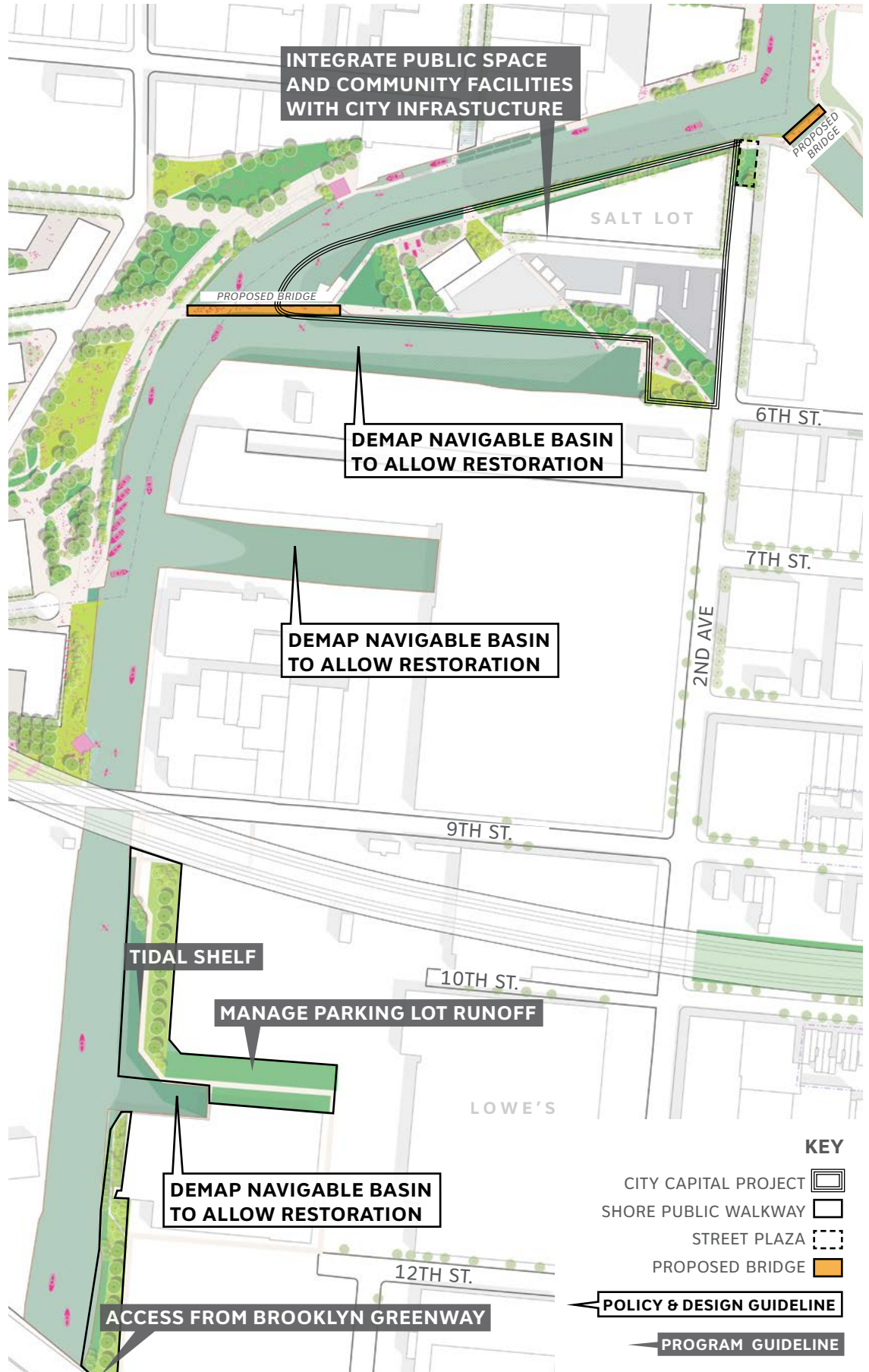
PROVIDE ACCESS, HABITAT RESTORATION, AND IMPROVED FLOW IN THE TURNING BASINS

- 23** 7TH STREET TURNING BASIN
- 24** 11TH STREET TURNING BASIN

BRING BACK PUBLIC SPACE UNDER THE 10TH ST VIADUCT

- 25** FRAN BRADY / UNDER THE TRACKS

WATERFRONT DESIGN & PROGRAMMING



THE SALT LOT

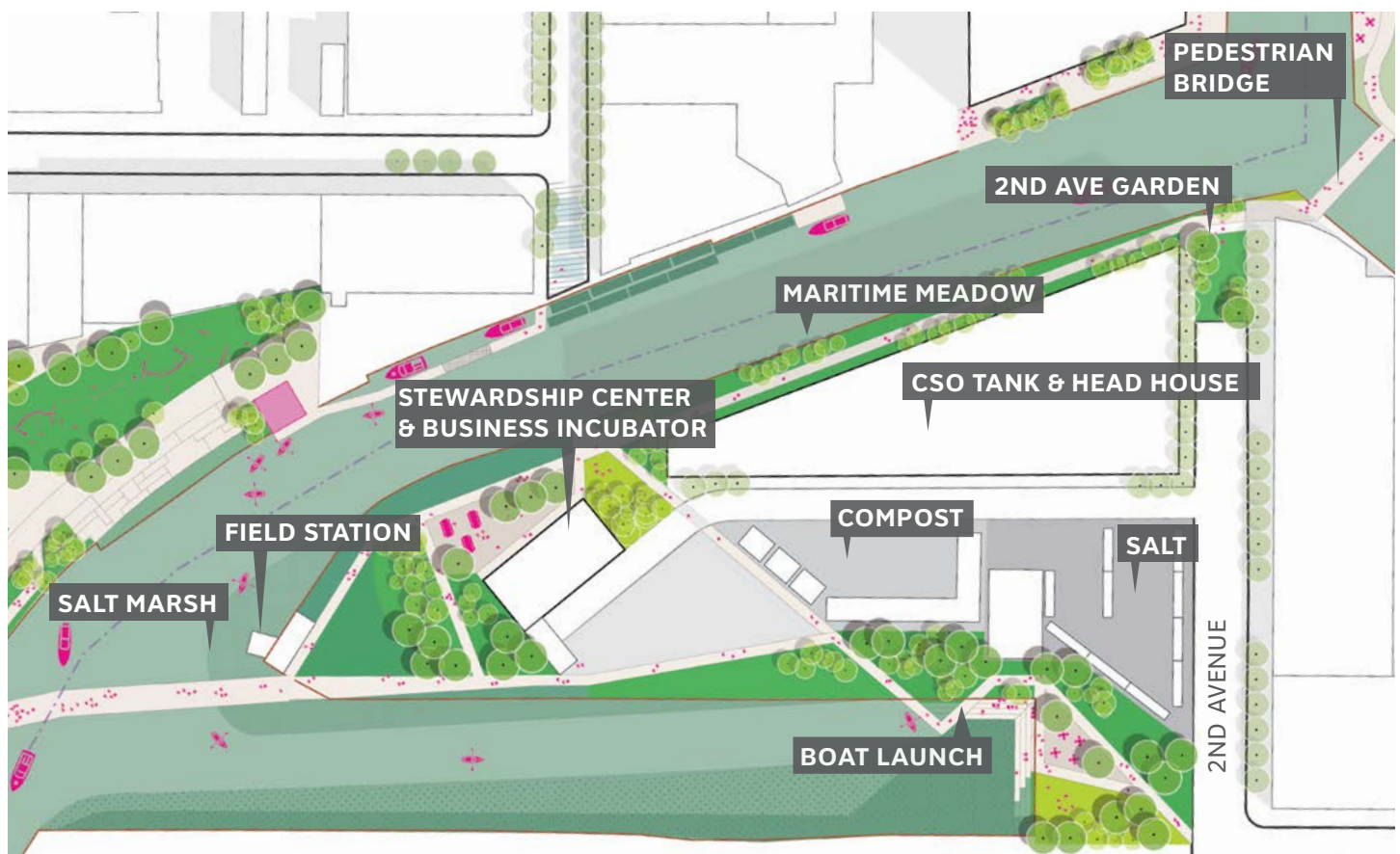
The eco-industrial heart of Gowanus and gateway to the Industrial Business Zone (IBZ), the Salt Lot provides critical city infrastructure, including salt storage and compost production, as well as a stewardship and education hub. The site should be improved and expanded to accommodate these uses in conjunction with planned combined sewage overflow infrastructure. In addition, the site should be developed with public space, a large-scale salt marsh restoration, and an industrial business incubator and job training center.

Facilities

- DSNY Salt Storage
- DEP CSO Tank and Head House
- NYC Compost Project Community Compost Facility Hosted by Big Reuse
- GCC Stewardship Center & Field Station
- IBZ business incubator and job training center

Public Spaces

- 2nd Avenue Street End Garden
- Maritime Meadow Edge
- Salt Marsh
- Turning Basin Boat Launch
- Connection via Pedestrian Bridges



FIELD STATION

The Gowanus Field Station is a platform for experiential, in situ science and design-based learning, and will be used in conjunction with GCC's innovative Science, Technology, Engineering and Math (STEM) curriculum. The Field Station's structured yet flexible design is centered on field lessons in which students observe, explore, test, and document the canal's ecology. It will also serve as a gathering and education space for the local community and volunteers. Features include covered work areas for group activities, storage and shelving for lab equipment and specimen display, an interactive marsh map for water system demonstrations, whiteboard and infographic surfaces, endemic plant green roofs, solar panels, and an upper level for expansive views of the canal.

in situ data collection

water and air sampling kits, microscopes, a weather station and other data collection tools facilitate learning in the field, at the canal's edge



green roof

200 gallons of water retained

that is equal to about 2 full bathtubs per 1.2" rain event



solar panels 2.1 kW

increased panel efficiency due to lower roof temp with the green roof we will have approximately 10,000 hours of laptop use per year



greywater to raingarden

4 gallons diverted

for 1 class of 30 students washing their hands at the sink



data visualization

working with the BKBioreactor, research on the microbiology of the canal is shown on info-poles around the site



rainwater collection

200 gallon capacity

rooftop drains are directed to slim waterhogs



infographics + art

wrap the field station exterior, showing the industrial and ecological history of the canal



hands on activities

are seeded throughout the field station

reclaimed wood

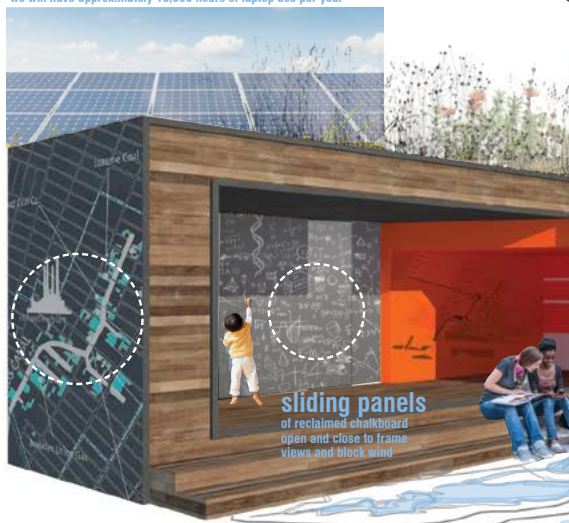
0 trees felled

coney island boardwalk is repurposed as a facade materials and marsh deck



sliding panels

of reclaimed chalkboard open and close to frame views and block wind



interactive watershed map

runnels cut into the wood deck show the movement of water through the original marsh



local + climate adapted flora

grown by the GCC and planted at the green roof, the rain garden, and grown on the trellis



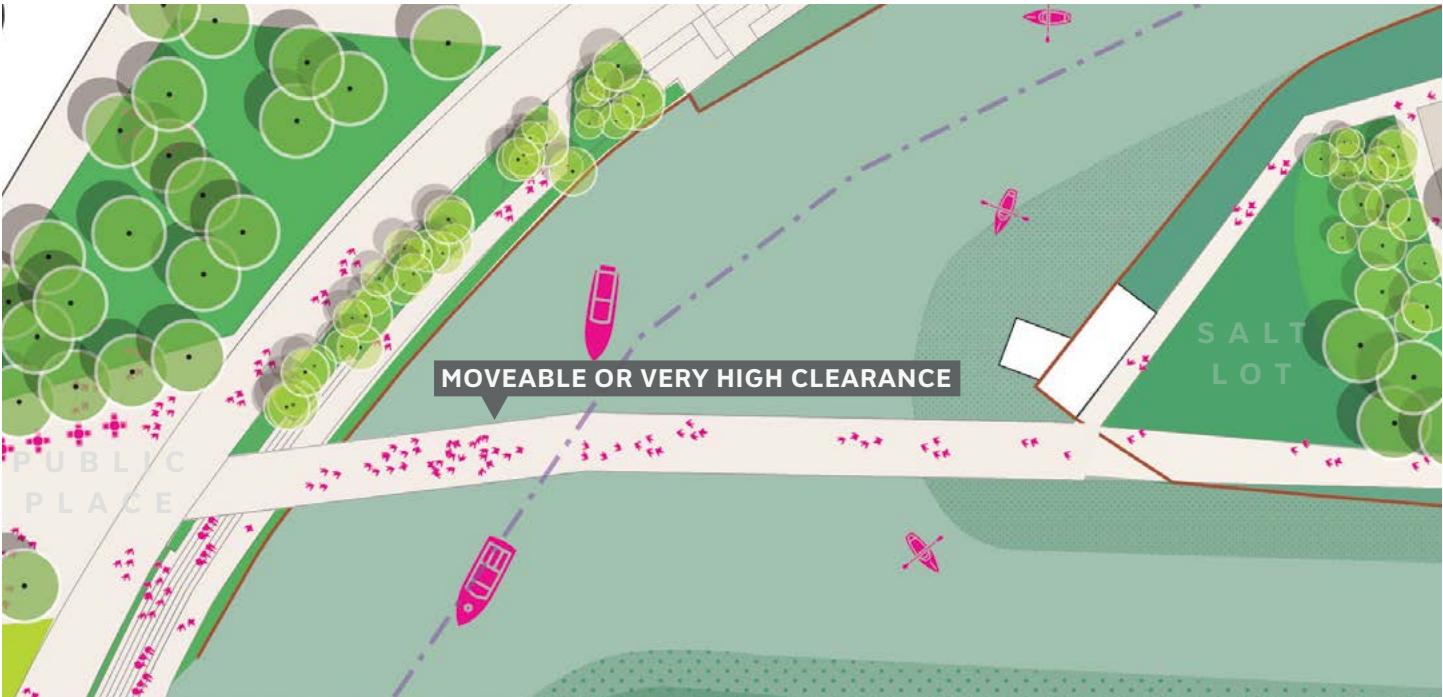
fauna specimen collection

collected by students, displayed in field station interior



threadcollective

PUBLIC PLACE BRIDGE



4TH STREET TURNING BASIN BRIDGE

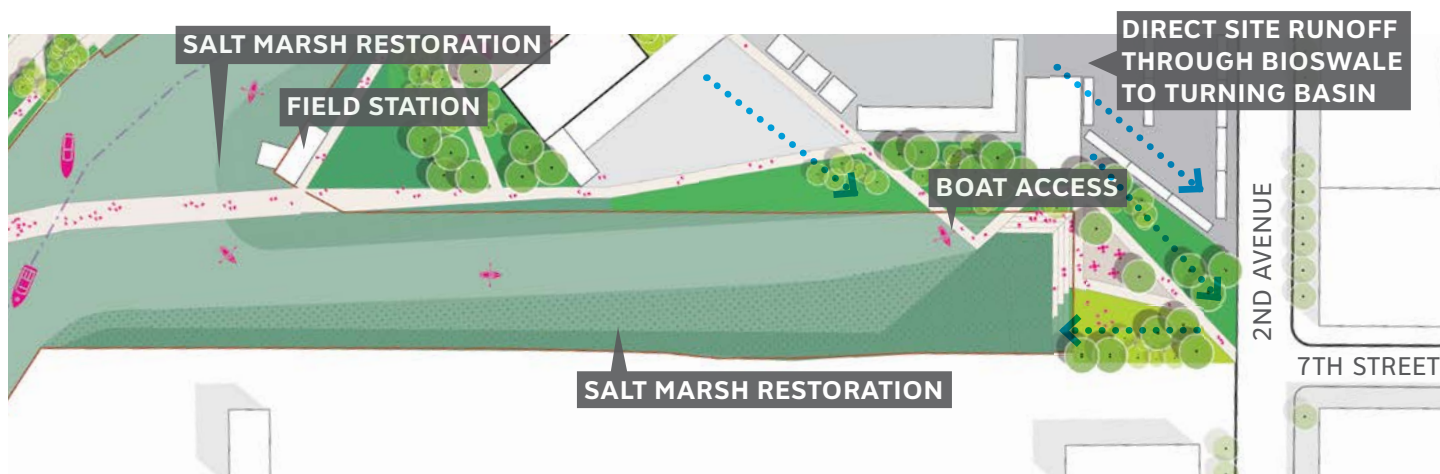


SALT LOT MARSH & 6TH STREET TURNING BASIN

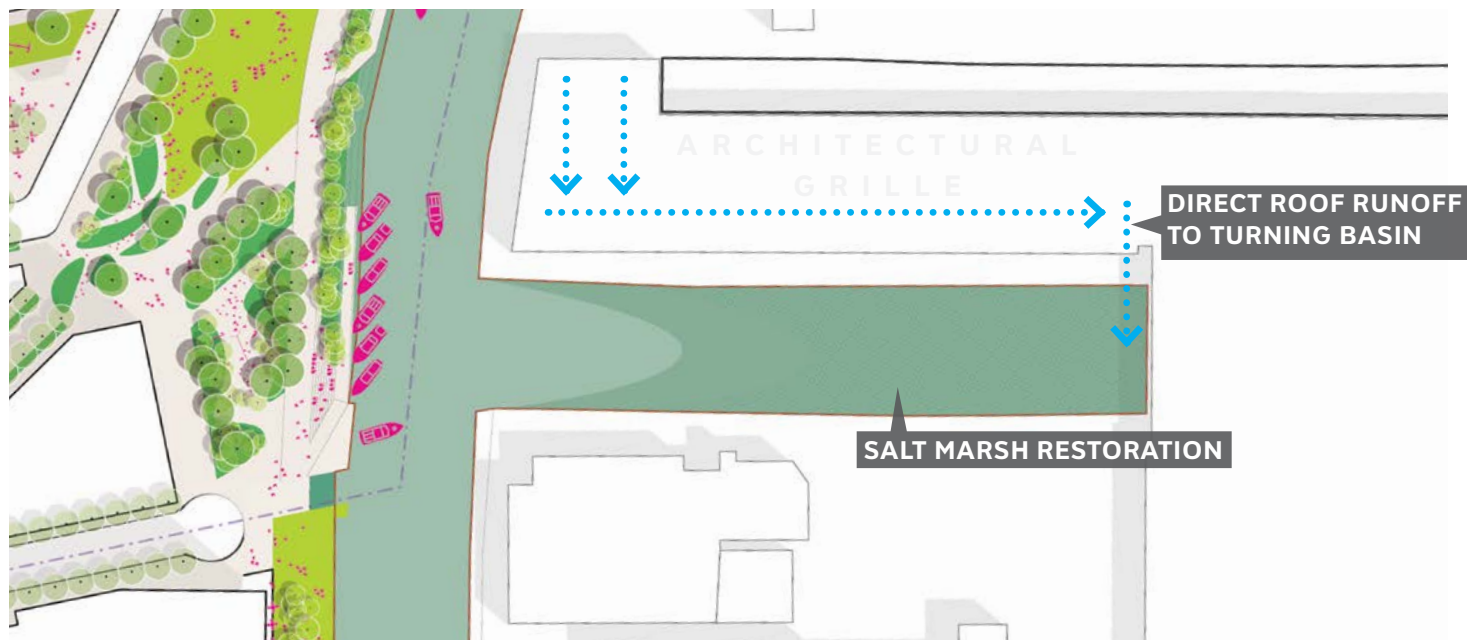
The 6th, 7th and 11th Street Turning Basins offer excellent opportunities for salt marsh restoration, either during or directly following the Superfund cleanup, as part of the Natural Restoration Damages process. These turning basins tend to be quite stagnant and have the worst water quality in the canal. They are rarely used by boats and should be demapped as navigable waterways, in order to be restored as wetlands with access for small boats. Stormwater from adjacent sites should be cleaned and directed into the ends of the turning basins, to promote water flow and ecological health.



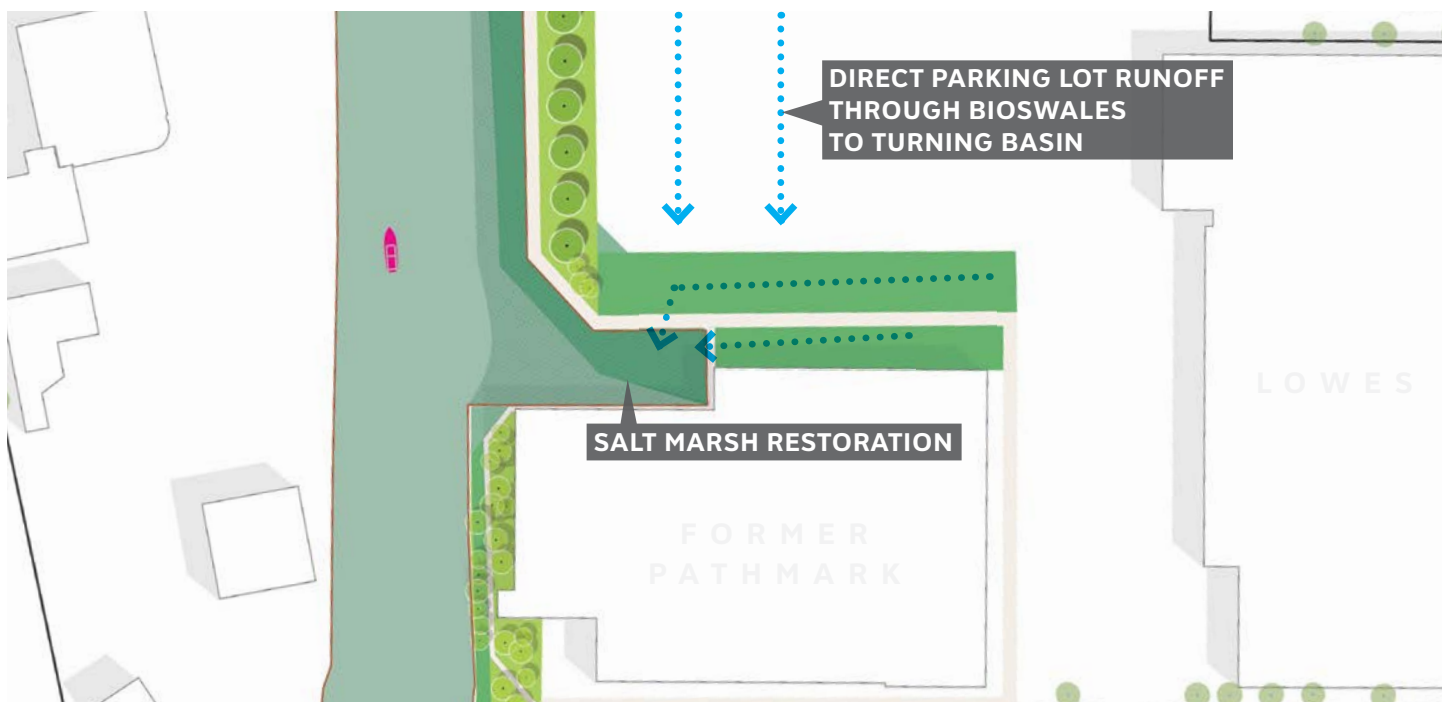
Salt Lot Marsh Rendering



7TH STREET TURNING BASIN



11TH STREET TURNING BASIN



FRAN BRADY / UNDER THE TRACKS PARK

Once an active community park, the space underneath the F/G train viaduct along 10th Street has been shuttered since the 1990s when MTA closed it to perform repairs on the viaduct. In a neighborhood severely lacking open space, this public space should be restored with spaces and programming to support the surrounding mixed-use neighborhood. Potential programs include artist residencies in mobile studios, rotating art installations, and a makers market, as well as a display area for the Kentile sign.



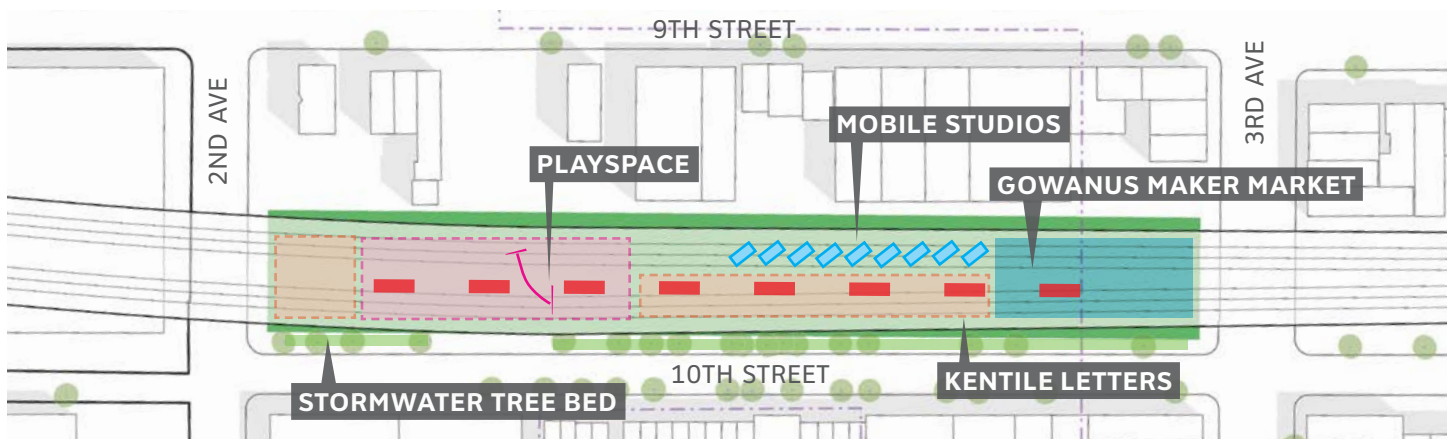
<https://www.onemorefoldedsunset.com/2018/03/under-tracks.html>

In 1996, the park was dedicated to Fran Brady, a life-long neighbor and advocate for the park.

"In the 1940's, when Ann Greco and her older sister Fran were growing up on 10th Street, they used to play in a park across the street from their house."

"Oh, it was beautiful," Ms. Greco recalled. "We had handball in front, we had shuffleboard, we had horseshoes, we had basketball and swings, we had monkey bars and slides. There was a park house on a mound, and a fellow that took care of the park."

NEIGHBORHOOD REPORT: PARK SLOPE; Resuscitating a Tiny Park As Precious as Childhood, By Tara Bahrapour, May 7, 2000



Proposal for KENTILE Sign to be displayed in Under the Tracks Park.
Source: Loci Architecture and Gowanus by Design

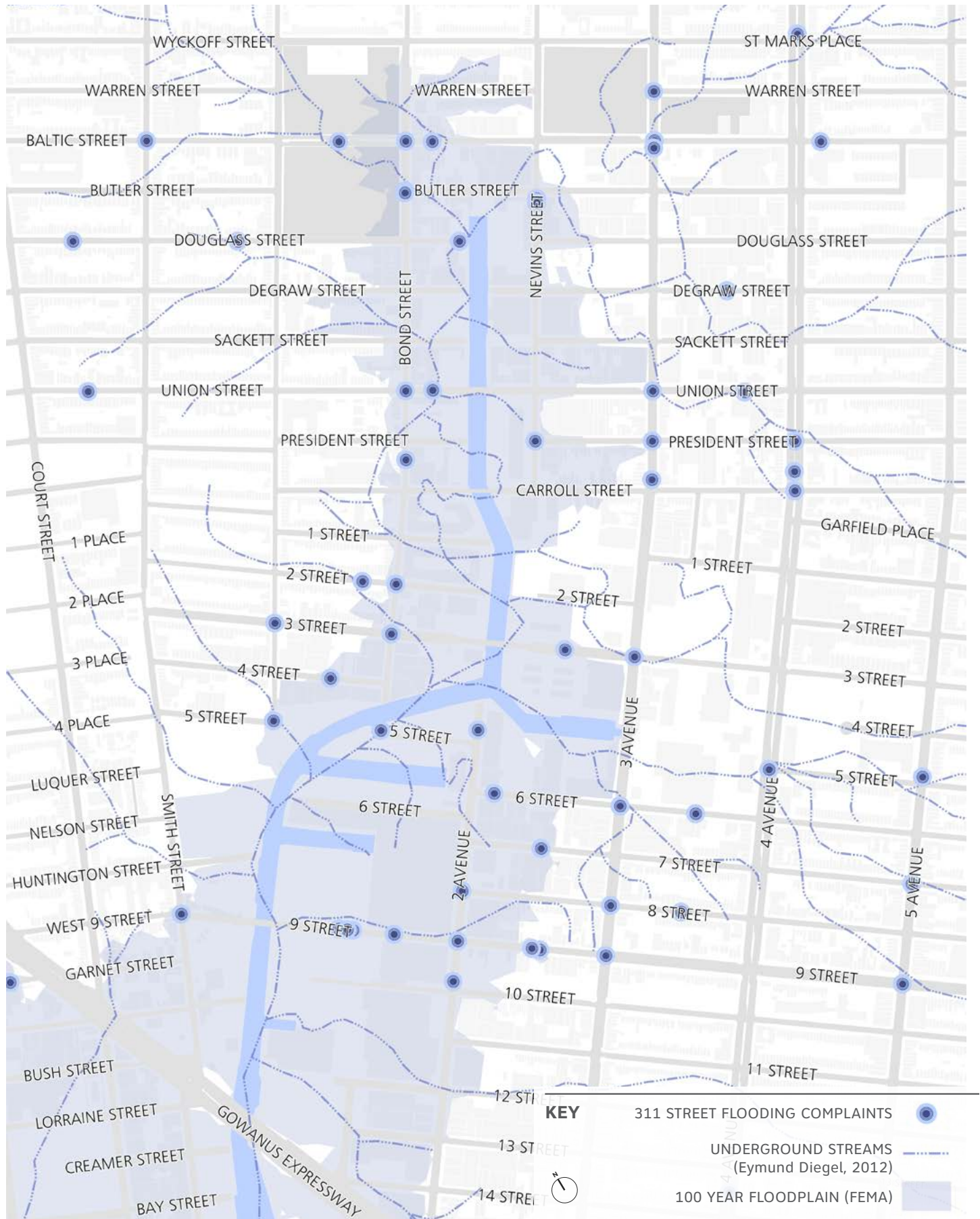


Mobile Studios provide temporary work space for artists

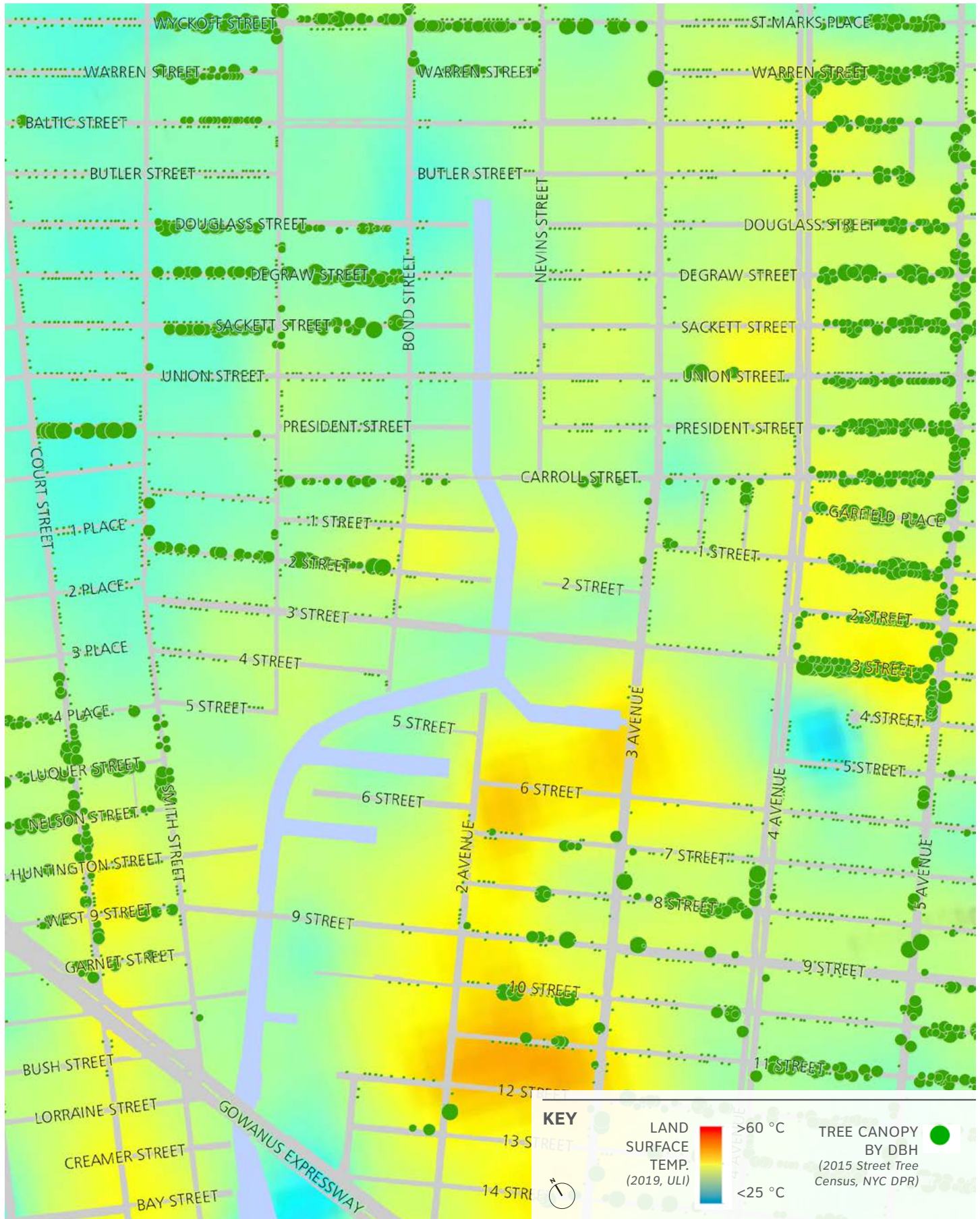
STREETSCAPES

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STORMWATER MANAGEMENT & FLOODING



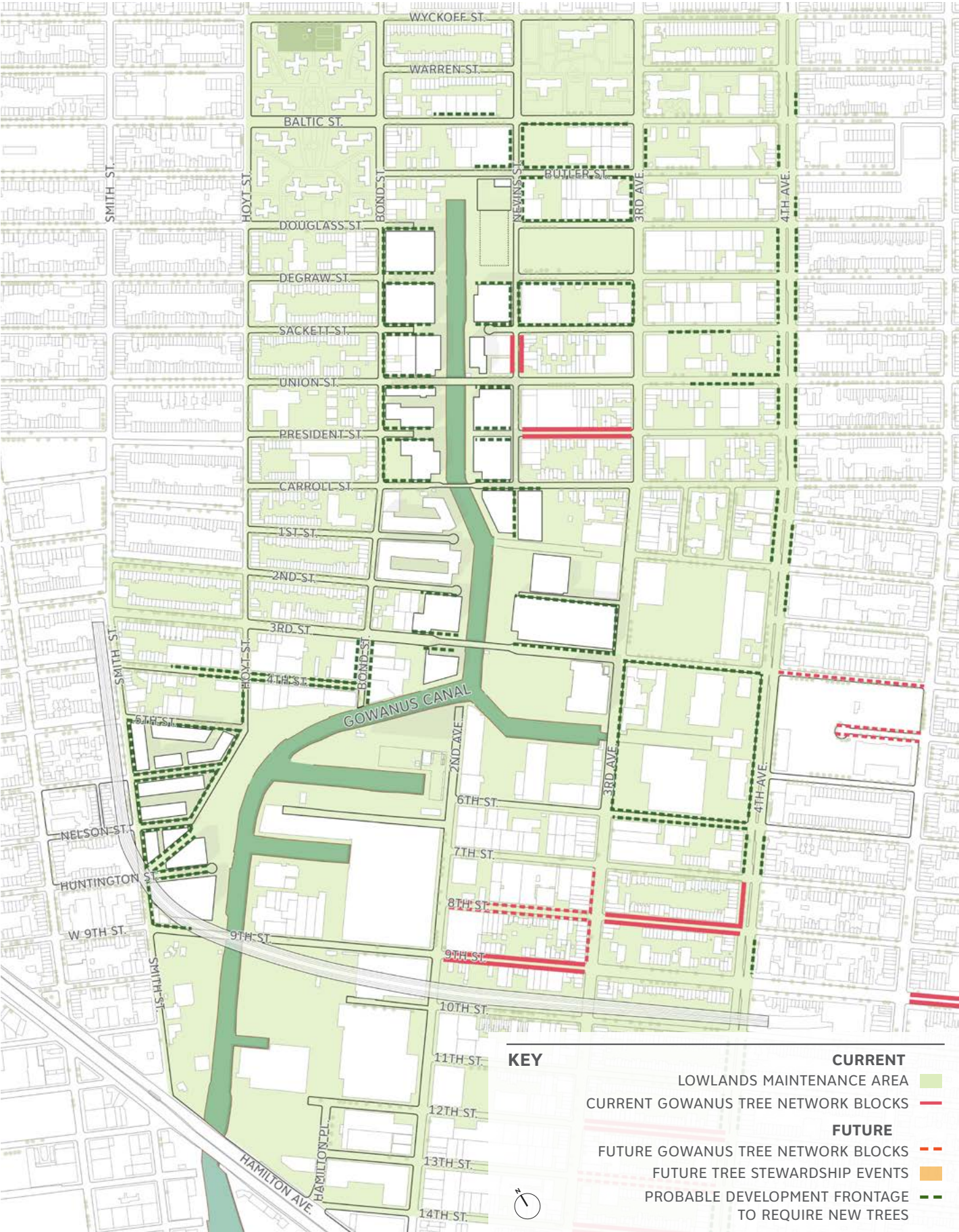
URBAN HEAT ISLAND & TREE CANOPY



SAFETY & ACCESS



GOWANUS TREE NETWORK & NEW DEVELOPER FRONTAGES



STREETSCAPE STRATEGY

Streets, sidewalks, and street ends in Gowanus provide critical public space and present both ongoing challenges and enormous opportunity, if built with the appropriate design and engagement from City agencies, developers, and neighbors. These challenges and opportunities should be addressed through four distinct strategies:



A recent development at 363-365 Bond installed a series of rain gardens in order to meet Superfund stormwater management standards, but failed to grade them properly to manage stormwater. Private developers need appropriate technical assistance to design effective tree beds and green infrastructure.

GOWANUS STREET DESIGN GUIDELINES

The rezoning will spur numerous new developments throughout Gowanus. Each developer will be required to repave sidewalks and plant street trees along their public street frontages, or contribute to a fund for trees planted elsewhere if their frontage does not allow for planting.

Gowanus Street Design Guidelines for sidewalks and tree plantings can help build a vibrant and resilient streetscape that reinforces the unique character of Gowanus. Guidelines for each street typology include tree and perennial species, paving and tree guard details, and green infrastructure techniques that are coordinated with NYC Builders Pavement Plan requirements.

GOWANUS DISTRICT TREE FUND

Given the potential obstructions for tree planting and the dire need for street trees, a district-scale Gowanus Tree Fund should be established to keep private investment within the neighborhood's urban forest and provide community oversight. If local conditions make it impossible for new development to plant required trees along new frontages, landowners should contribute to a trust in lieu of planting. This will allow for investment to be allocated where it is needed most throughout the district in order to pay for tree planting, tree guards, and sidewalk repairs, as well as support volunteer stewardship.



Gowanus District Tree Fund boundaries



The Union Street Bridge undergoing maintenance to ensure operations for regular opening during the Superfund clean-up

CITY CAPITAL PROJECTS

As Gowanus becomes more dense and faces growing heat island impacts and rising tides, it is critical that the City invest in streetscapes, intersections, and bridges to improve safety, wayfinding, and environmental performance.

These investments should be a key part of the Neighborhood Development Fund associated with the rezoning. Significant green infrastructure or access projects may also credit towards the future Natural Resource Damages settlement under Superfund law.

GOWANUS TREE NETWORK

The Gowanus Tree Network is made up of block associations and neighbors who receive support and technical assistance to care for street trees, enlarge tree beds, plant perennials, and install tree guards. Blocks with new street trees should be integrated into this growing network of stewards.



Neighbors caring for trees on President Street

STREET-SPECIFIC DESIGN OBJECTIVES

The below streetscape-specific design goals inform the recommendations on following pages for developer requirements, permitting modifications, and targeted capital investment.

NORTH - SOUTH

NEVINS & BOND

- Manage stormwater with suspended paving and other site-based retention
- Plant salt- and flood-tolerant species
- Reinforce Gowanus character with reused cobble, multiple tree plantings, tree guards

3RD AVENUE

- Manage stormwater south of Carroll Street with suspended paving and other site-based retention
- Mitigate urban heat island and plant large canopy trees where possible
- Install tree guards
- Provide access at 1st Street Turning Basin
- Provide interpretation at 4th Street Turning Basin

4TH AVENUE

- Manage stormwater on uphill eastern side of avenue to mitigate street flooding
- Mitigate urban heat island and plant large canopy trees where possible
- Mitigate wind tunnel impacts to improve pedestrian experience next to proposed density
- Require above-ground planters or greened building facades for new developments where tree planting is not possible due to underground infrastructure
- Improve safety for bikes and trucks through protected bike lane (planned by DOT)
- Improve crossings and streetscape around key assets: Washington Park, Pacific Library, Greenspace on Fourth
- Activate the median at key “gateway” locations with wayfinding and rotating public art

EAST - WEST

BRIDGE STREETS

- Manage stormwater and reinforce corridors with densely planted right-of-way rain gardens and enhanced tree beds
- Provide wayfinding at intersections with north-south streets
- Provide interpretation about the canal on the bridges
- Provide generous access to waterfront public space
- Provide multi-modal bridges to improve safety

STREET ENDS

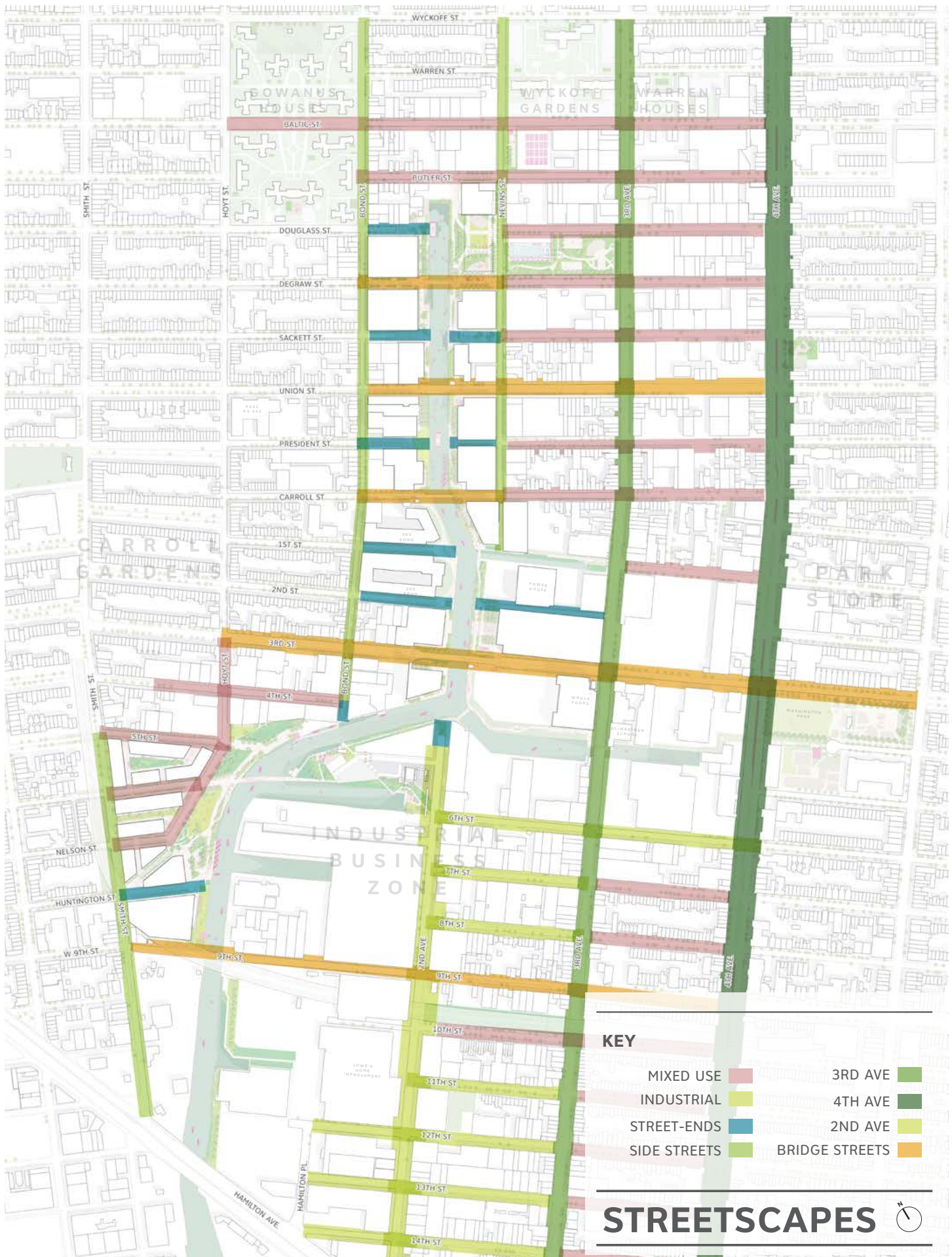
- Keep street ends low with low bulkheads, terraces and boardwalks to allow for views, access, and controlled flooding
- Provide large scale stormwater retention to maximize efficiency by allowing water from upland streets to cross intersections toward retention assets
- Where possible, close part or all of street ends to regular traffic, to better connect to waterfront public space
- Plant salt- and flood-tolerant species
- Reinforce Gowanus character with reused cobble, multiple tree plantings
- Improve ecological performance with street creeks and wet swales

MIXED USE STREETS

- Manage stormwater with right-of-way rain gardens, enhanced tree beds, and suspended paving
- Plant trees, widen tree beds, plant perennials
- Install tree guards

INDUSTRIAL STREETS

- Install tree guards or blocks that can stand up to loading and industrial activity
- Manage stormwater with suspended paving and other site-based retention that allows parking, loading, and other industrial activities



4TH AVENUE

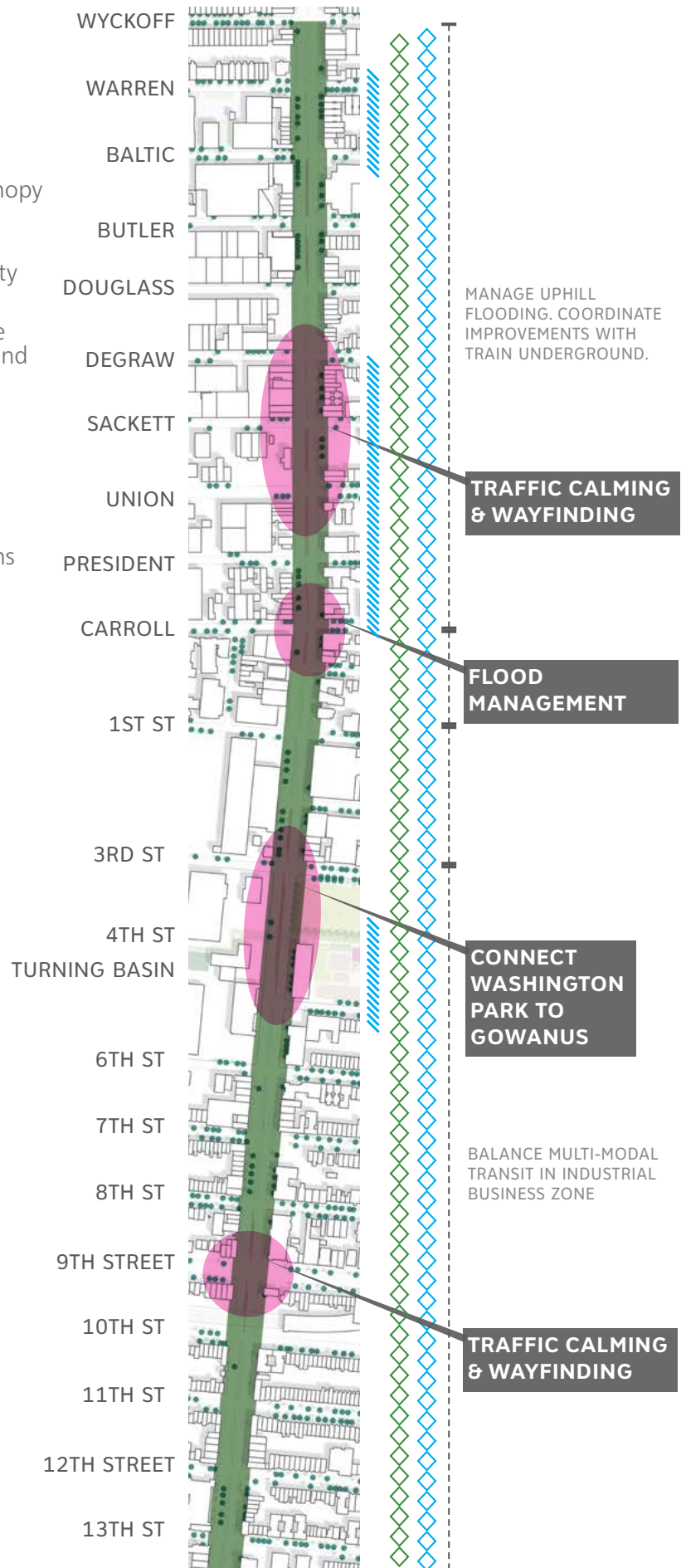
STREET-SPECIFIC DESIGN OBJECTIVES

- Manage stormwater on uphill eastern side of avenue to mitigate street flooding
- Mitigate urban heat island and plant large canopy trees where possible
- Mitigate wind tunnel impacts to improve pedestrian experience next to proposed density
- Require above-ground planters or greened building facades for new developments where tree planting is not possible due to underground infrastructure
- Improve safety for bikes and trucks through protected bike lane (planned by DOT)
- Improve crossings and streetscape around key assets: Washington Park, Pacific Library, Greenspace on Fourth
- Activate the median at key “gateway” locations with wayfinding and rotating public art



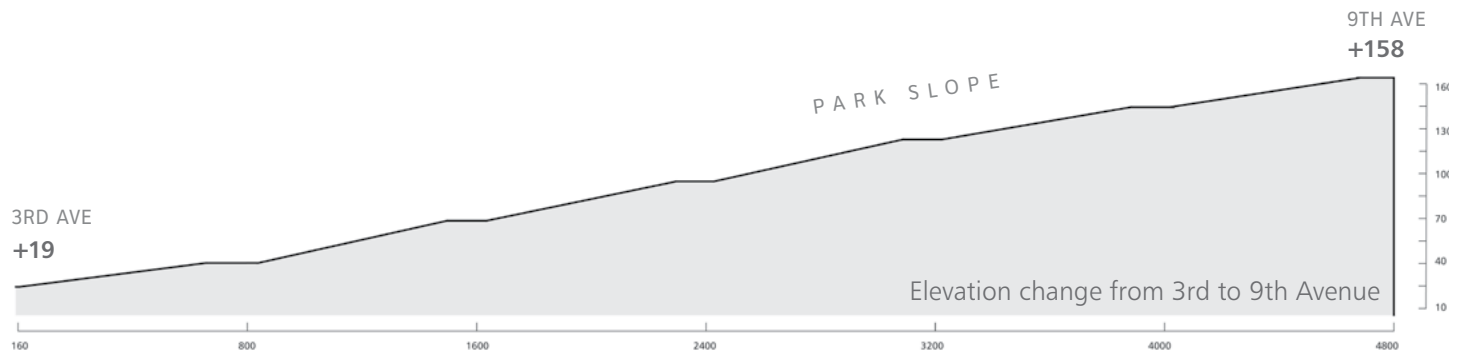
Temporary public art installation by Emily Weiskopf, 4th Ave between 3rd St and 5th St

KEY		
SHADE TREE PLANTING		
STORMWATER MANAGEMENT		
FLOOD RESILIENCE		
CRITICAL NODE		



FLOOD MANAGEMENT

4th Avenue regularly floods during storms from a combination of stormwater flow from Park Slope and the R train, which acts like a dam. There is a critical need for stormwater management on the east, or uphill, side of the street.



NYC DOT Proposed 4th Avenue Streetscape Section



4th Avenue flooding, 1922



4th Avenue flooding, 1947



4th Avenue flooding at Carroll St., 2013
Brownstoner.com

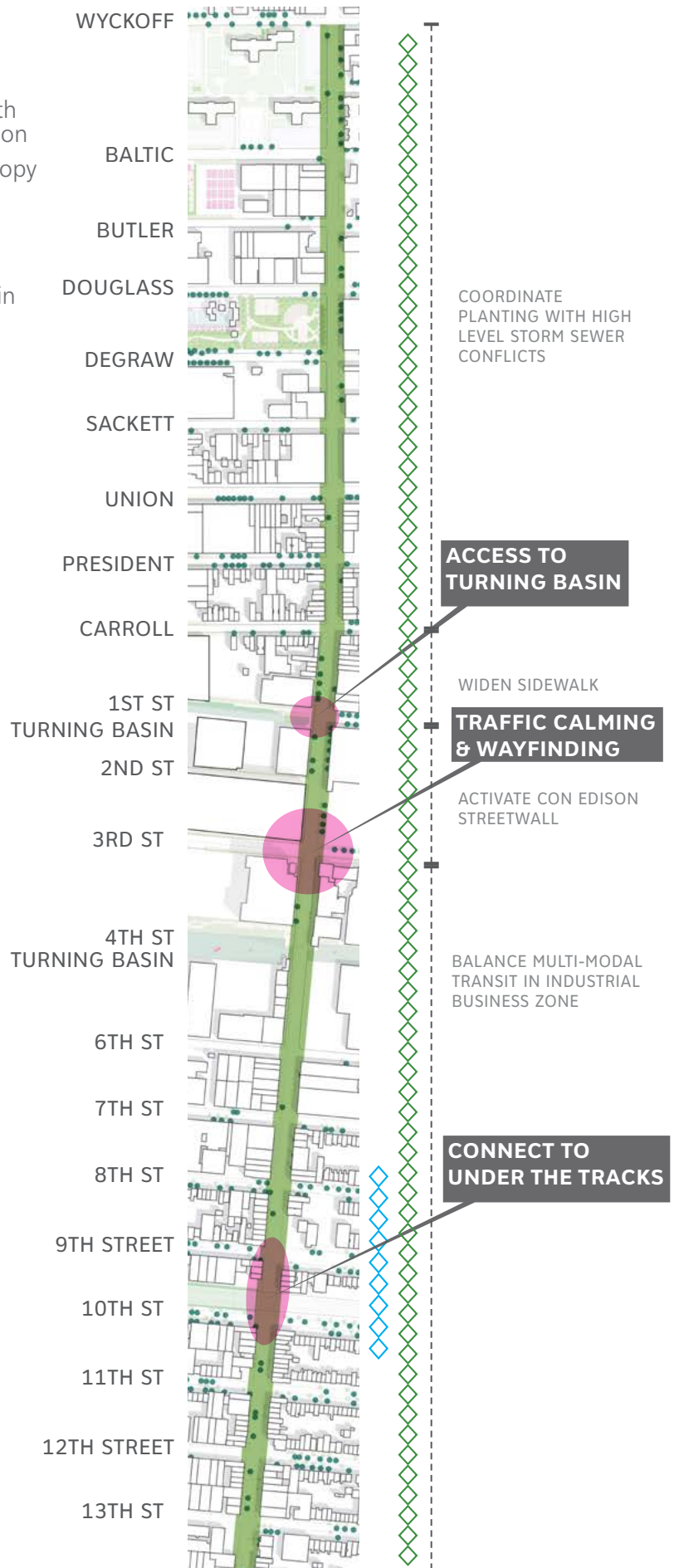


4th Avenue flooding near Carroll St., 2019
Adrienne Zhao

3RD AVENUE

STREET-SPECIFIC DESIGN OBJECTIVES

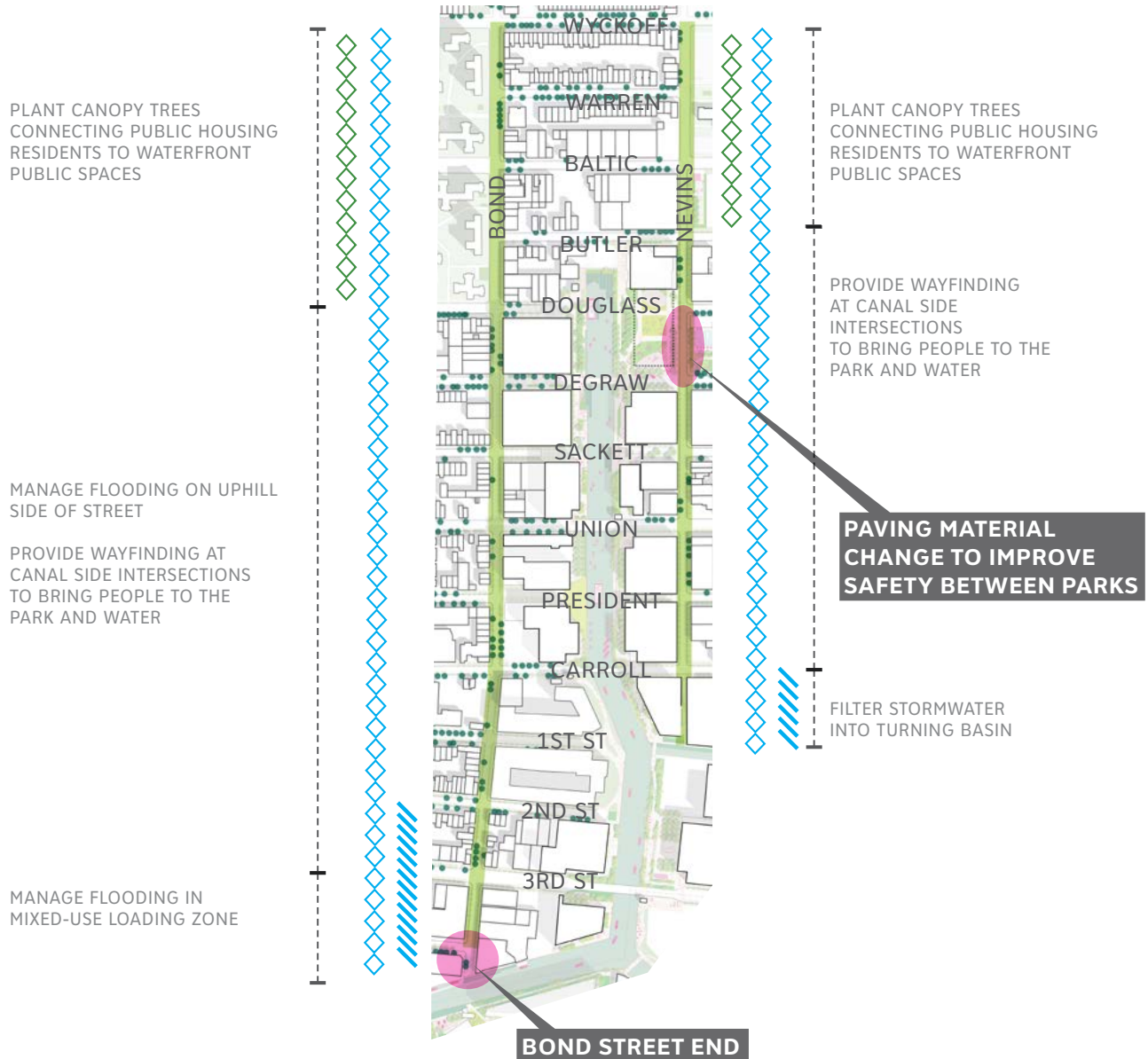
- Manage stormwater south of Carroll Street with suspended paving and other site-based retention
- Mitigate urban heat island and plant large canopy trees where possible
- Install tree guards
- Provide access at 1st Street Turning Basin
- Provide interpretation at 4th Street Turning Basin



NEVINS & BOND

STREET-SPECIFIC DESIGN OBJECTIVES

- Manage stormwater with suspended paving and other site-based retention
- Plant salt- and flood-tolerant species
- Reinforce Gowanus character with reused cobble, multiple tree plantings, tree guards



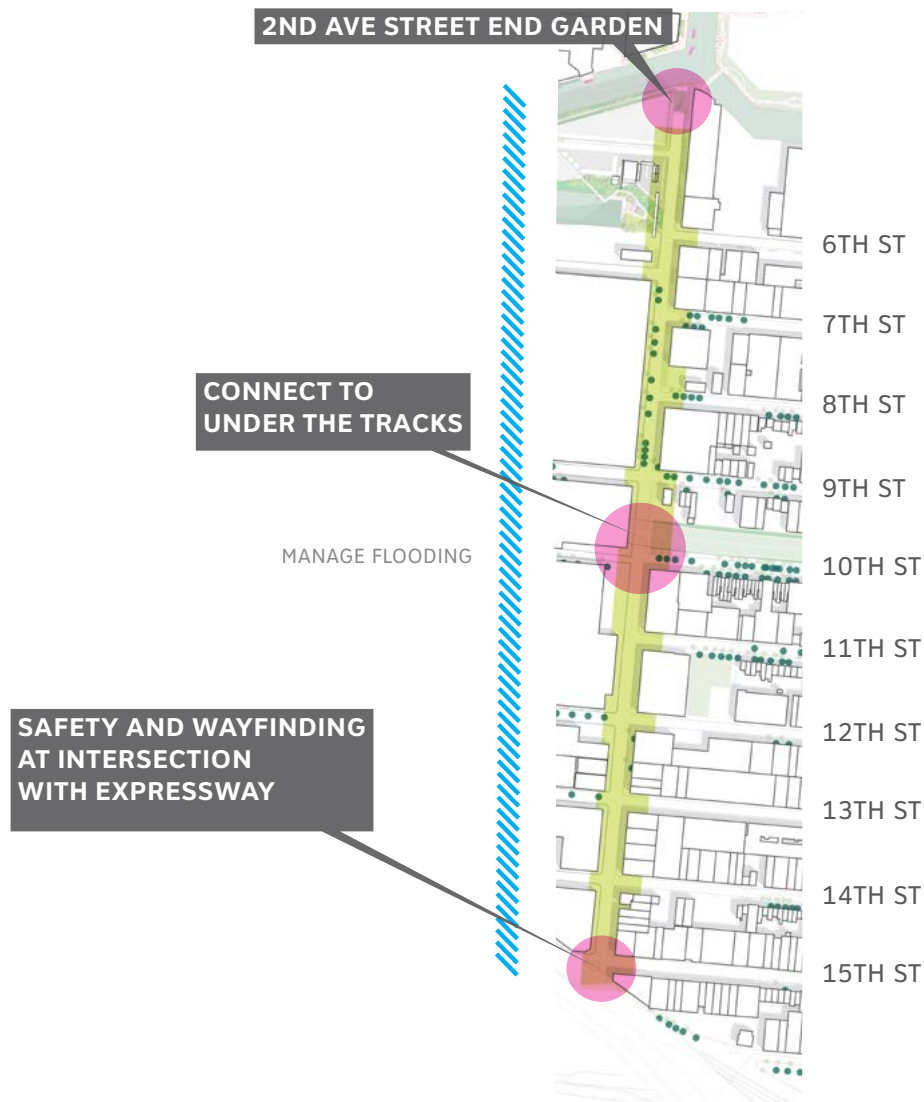
KEY		
SHADE TREE PLANTING		
STORMWATER MANAGEMENT		
FLOOD RESILIENCE		
CRITICAL NODE		



2ND AVENUE

STREET-SPECIFIC DESIGN OBJECTIVES

- Install tree guards or blocks that can stand up to loading and industrial activity
- Manage stormwater with suspended paving and other site-based retention that allows parking, loading, and other industrial activities



KEY

SHADE TREE PLANTING	
STORMWATER MANAGEMENT	
FLOOD RESILIENCE	
CRITICAL NODE	



INDUSTRIAL SIDE STREETS

STREET-SPECIFIC DESIGN OBJECTIVES

- Install tree guards or blocks that can stand up to loading and industrial activity
- Manage stormwater with suspended paving, structural soil, and other site-based retention that allows parking, loading, and other industrial activities

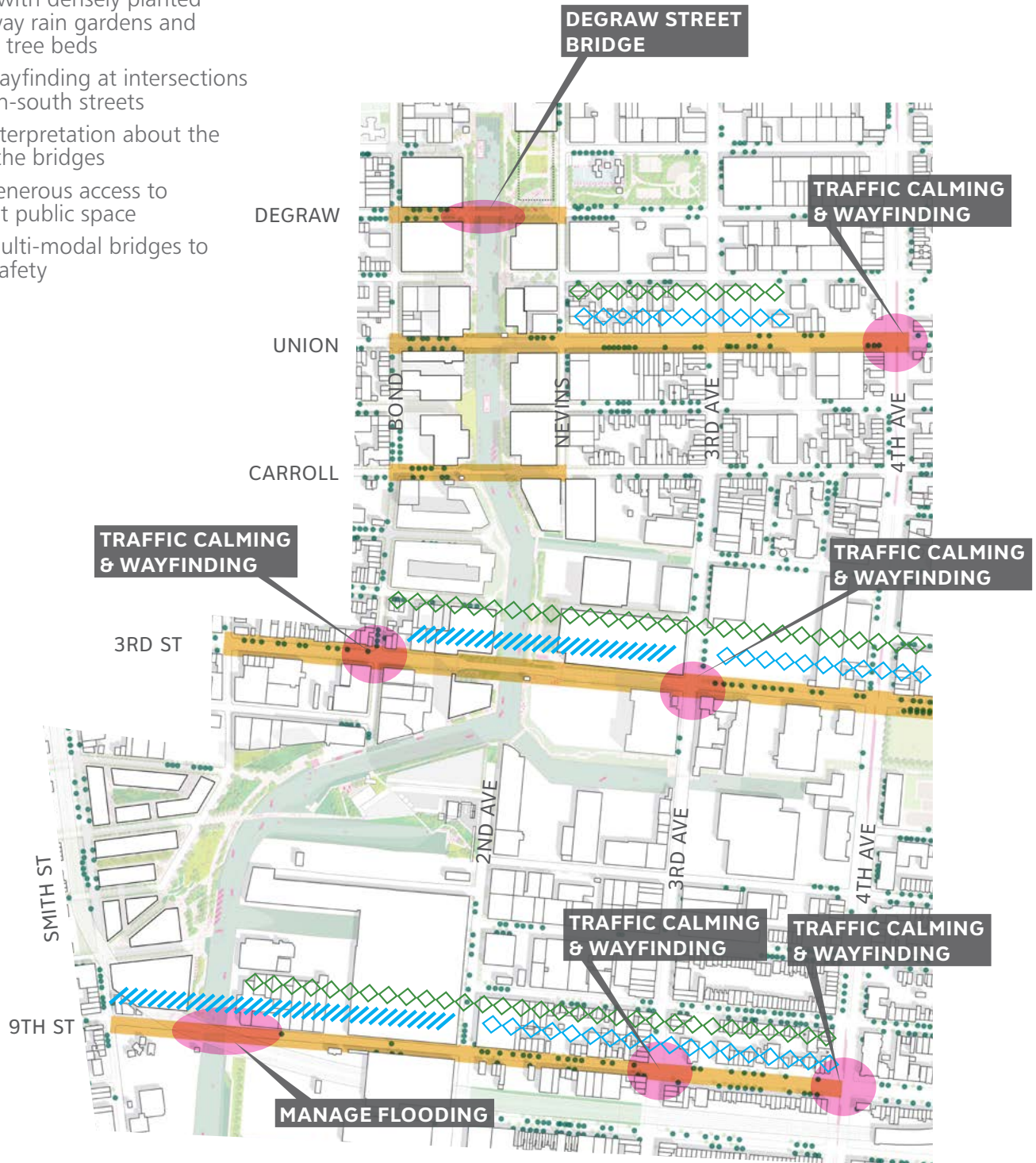


KEY	SHADE TREE PLANTING	
	STORMWATER MANAGEMENT	
	FLOOD RESILIENCE	
	CRITICAL NODE	

BRIDGE STREETS

STREET-SPECIFIC DESIGN OBJECTIVES

- Manage stormwater and reinforce corridors with densely planted right-of-way rain gardens and enhanced tree beds
- Provide wayfinding at intersections with north-south streets
- Provide interpretation about the canal on the bridges
- Provide generous access to waterfront public space
- Provide multi-modal bridges to improve safety



KEY

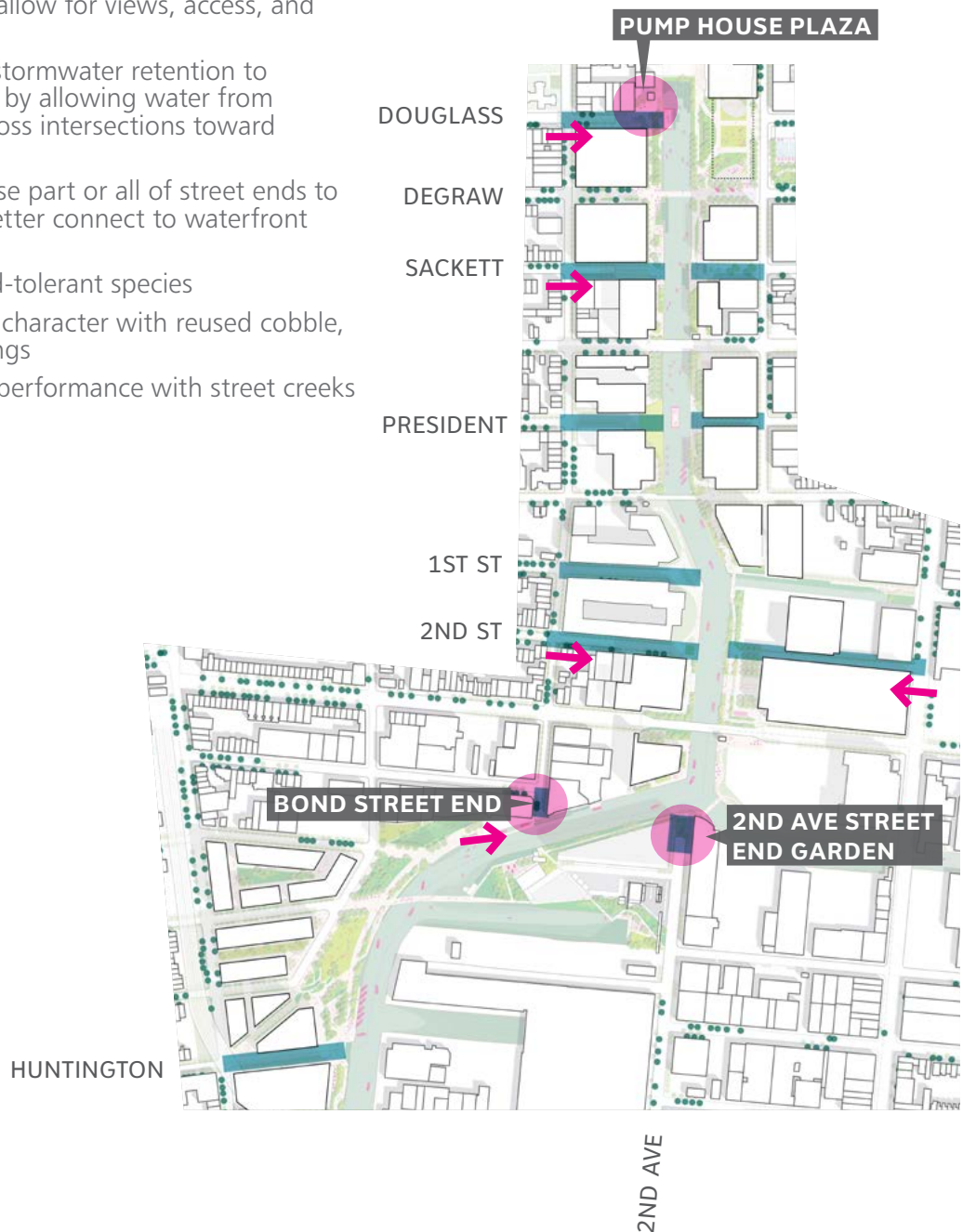
SHADE TREE PLANTING	
STORMWATER MANAGEMENT	
FLOOD RESILIENCE	
CRITICAL NODE	



STREET ENDS

STREET-SPECIFIC DESIGN OBJECTIVES

- Keep street ends low with low bulkheads, terraces and boardwalks to allow for views, access, and controlled flooding
- Provide large scale stormwater retention to maximize efficiency by allowing water from upland streets to cross intersections toward retention assets
- Where possible, close part or all of street ends to regular traffic, to better connect to waterfront public space
- Plant salt- and flood-tolerant species
- Reinforce Gowanus character with reused cobble, multiple tree plantings
- Improve ecological performance with street creeks and wet swales



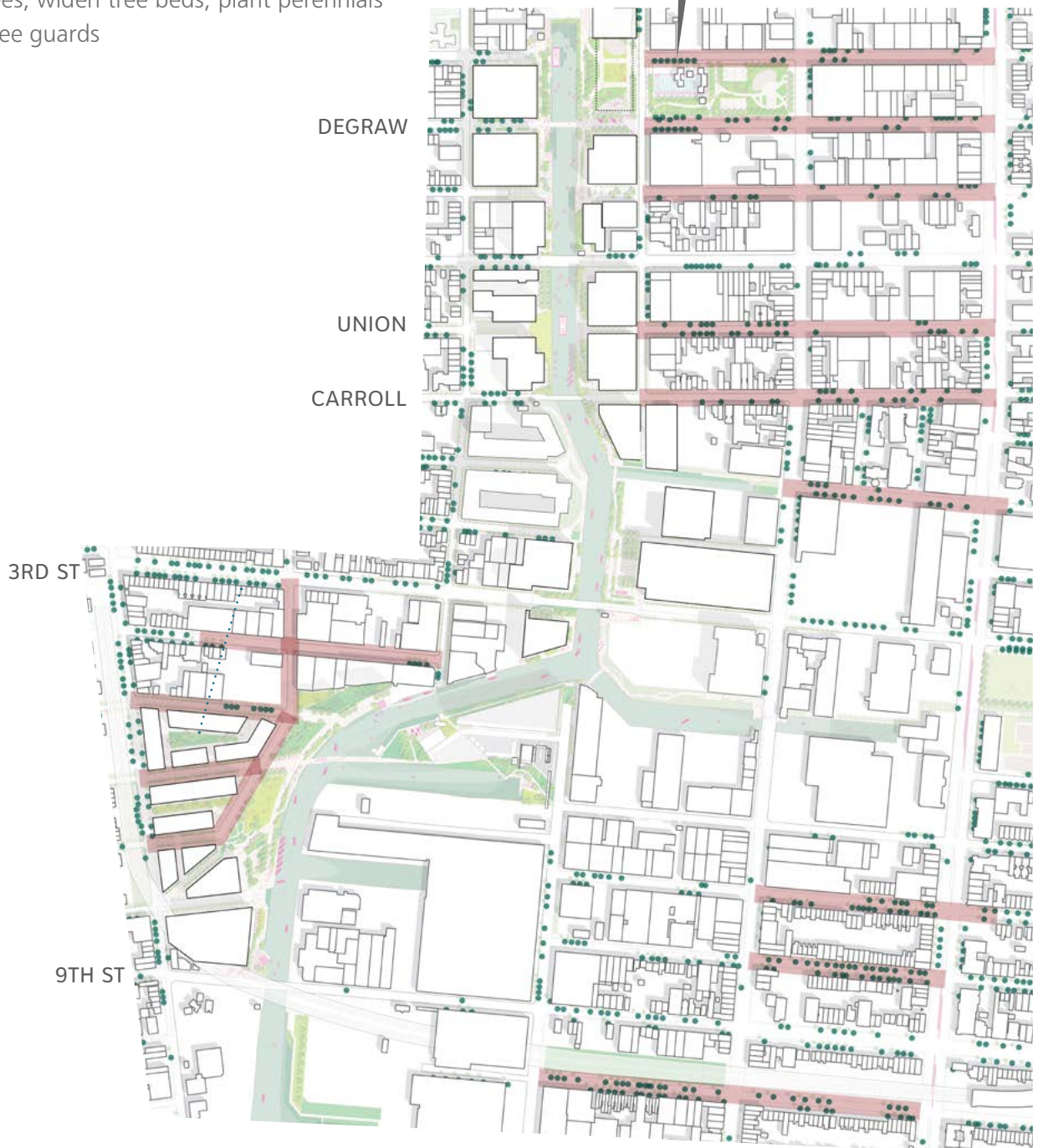
KEY		
SHADE TREE PLANTING		
STORMWATER MANAGEMENT		
FLOOD RESILIENCE		
CRITICAL NODE		
ALLOW WATER TO CROSS INTERSECTIONS		

MIXED-USE STREETS

STREET-SPECIFIC DESIGN OBJECTIVES

- Manage stormwater with right-of-way rain gardens, enhanced tree beds, and suspended paving
- Plant trees, widen tree beds, plant perennials
- Install tree guards

PROTECT MATURE TREES
DURING REMEDIATION



KEY

- SHADE TREE PLANTING 
- STORMWATER MANAGEMENT 
- FLOOD RESILIENCE 
- CRITICAL NODE 



STORMWATER & SEWAGE

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CONTEXT

HISTORIC HYDROLOGY

The 1.8-mile-long Gowanus Canal was constructed in the 1860s on the site of a former salt marsh and creek. It has a long history of environmental issues, including industrial pollution and combined sewer overflow (CSO). The Gowanus neighborhood is rich in natural resources, including the canal, a high groundwater table, and numerous underground creeks.



1817, John Rubens Smith, *Gowanus Road looking towards Denton's Pond*

TODAY'S HYDROLOGY

The area's hydrological resources and saturated soils often complicate inhabitation of this low-lying area, as streams run through many basements and the lack of infiltration capacity causes frequent street flooding during rain events. CSO into the canal is a regular occurrence during wet weather events, which has been exacerbated by limitations of the neighborhood's aging infrastructure and increasing development.



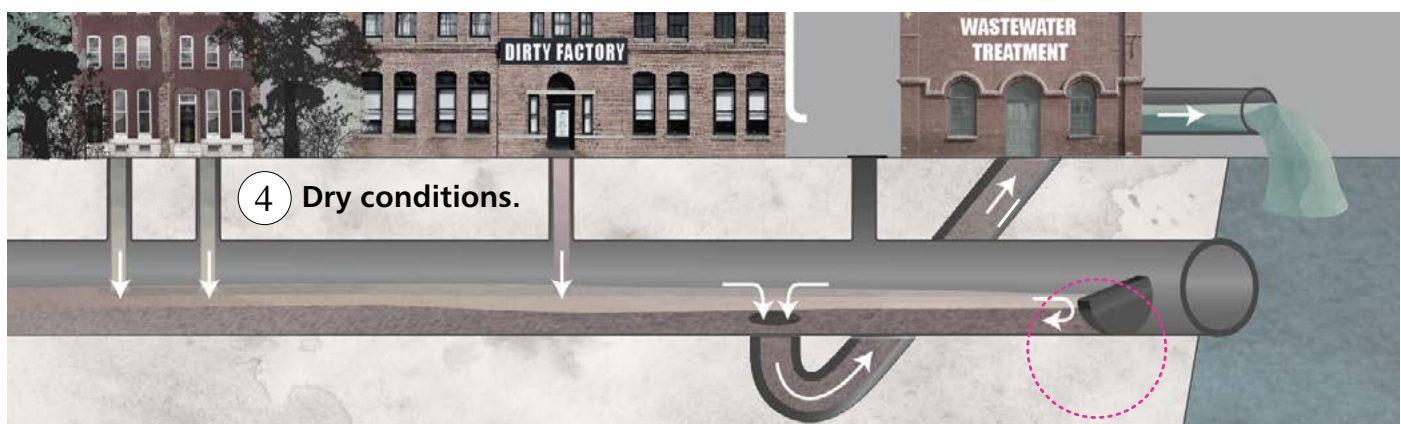
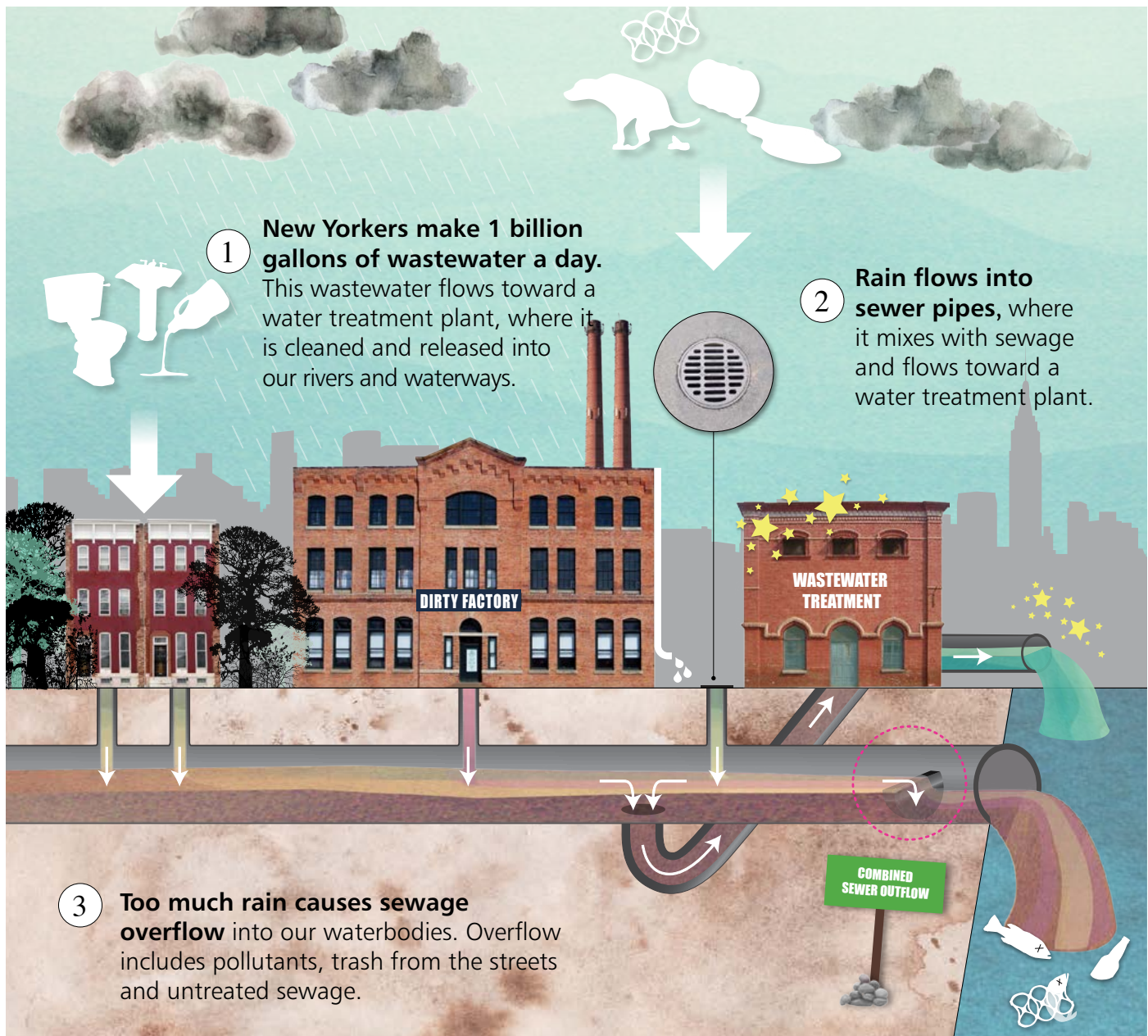
Street flooding on 9th Street during wet weather



Combined Sewer Overflow along the banks of the Gowanus Canal.
Photo Credit: Eymund Deigel

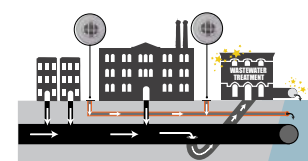
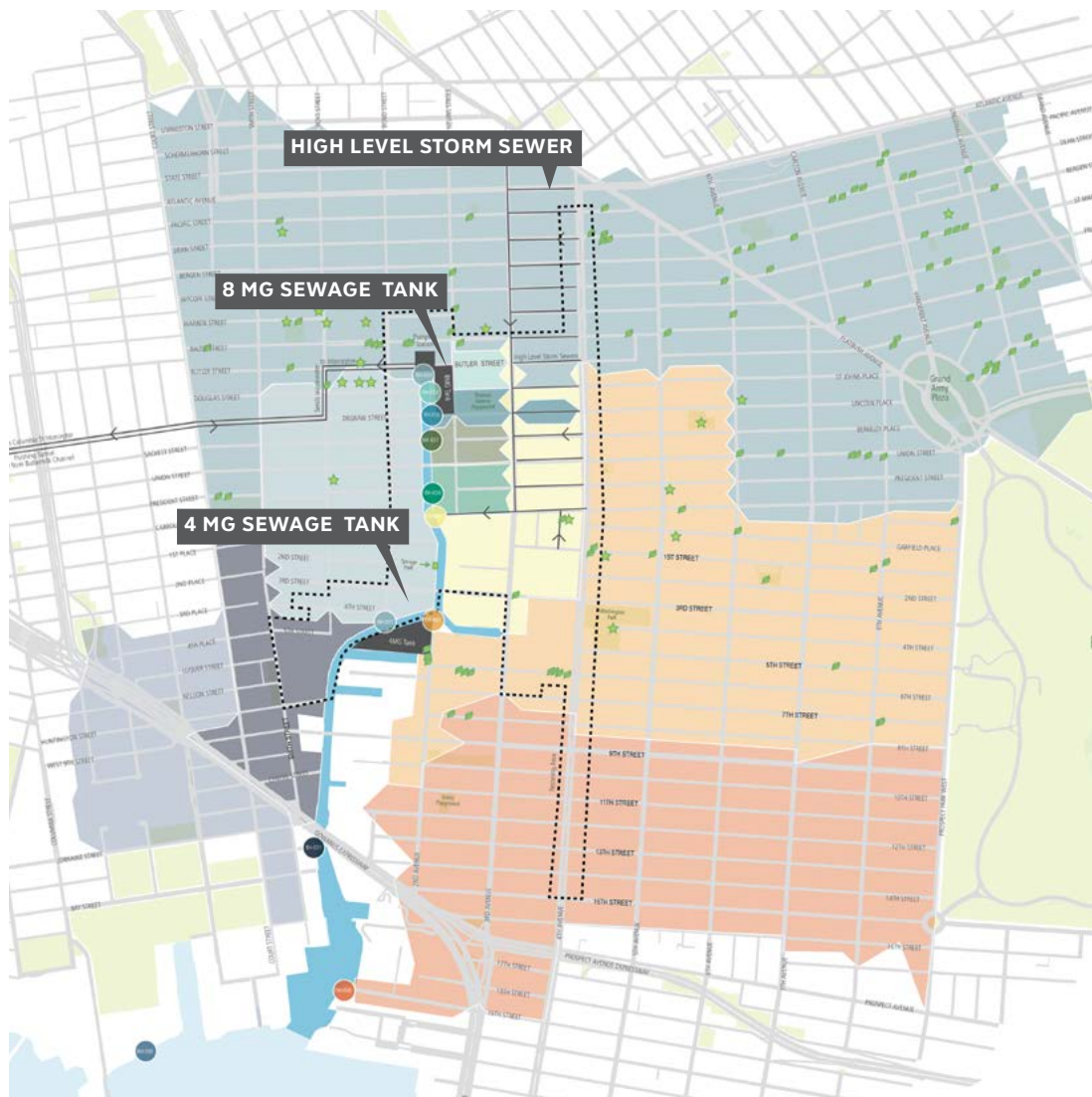
UNDERSTANDING THE SYSTEM

Combined Sewer Overflow (CSO) systems carry sewage from homes and businesses, as well as stormwater that flows over streets and other paved surfaces. A typical rainstorm in NYC generates more water than our sewer system can handle, which causes raw sewage and untreated stormwater to overflow into our waterways.



CSOs are the greatest source of ongoing pollution to the Gowanus Canal. The overloaded sewer system currently discharges about 363 million gallons of raw sewage and untreated stormwater into the Gowanus Canal each year. Overflow events happen as often as 59 times a year and after as little as 0.37 inches of rain.

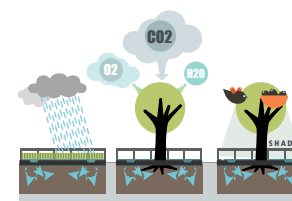
The NYC Department of Environmental Protection (DEP) is designing and constructing grey and green infrastructure across the Gowanus Watershed to reduce CSO and decrease the amount of raw sewage flowing into the canal. DEP installations currently underway include a growing number of curbside rain gardens, or bioswales; a high level storm sewer system; and 2 large underground sewage detention tanks, which are part of the Superfund remedy.



HIGH LEVEL STORM SEWERS (HLSS)



SEWAGE TANKS



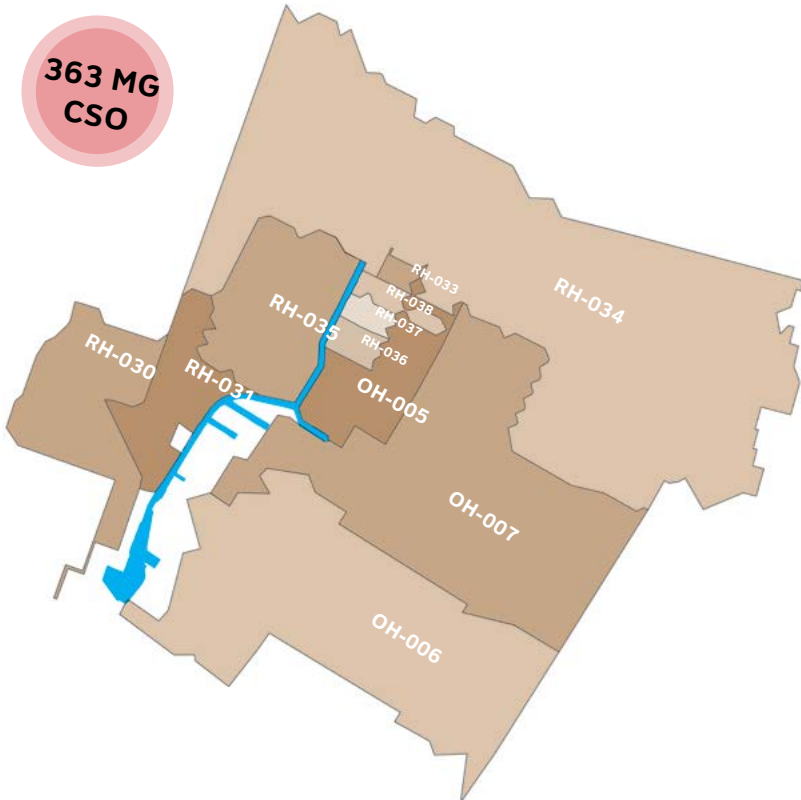
GREEN INFRASTRUCTURE

PLANNING FOR THE FUTURE

In 2019, the Department of City Planning (DCP) released a Draft Scope of Work for the rezoning of the Gowanus neighborhood, in which the City projected the rezoning could bring 20,000 new residents to Gowanus and increase wastewater generation (from showers, sinks, and toilets) by 1 billion gallons per year. As the rezoning will increase density and wastewater generation, it must include further infrastructure investment to manage more wastewater and stormwater.

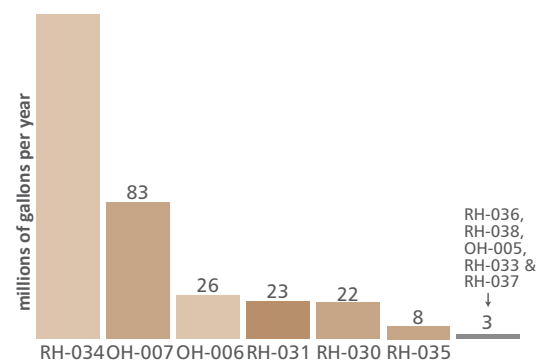
THE IMPACT OF DEVELOPMENT

GOWANUS CSO-SHEDS



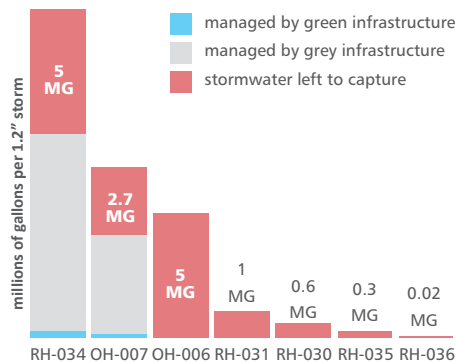
There are 11 CSO outfalls in the Gowanus Watershed, draining stormwater and sewage from 11 sub-catchment areas or CSO-sheds.

Due to variations in infrastructure and population, the amount of precipitation required to trigger an overflow at each outfall varies. 7 of the CSO-sheds overflow during 1.2" rain events. All of them overflow during 2" rain events.

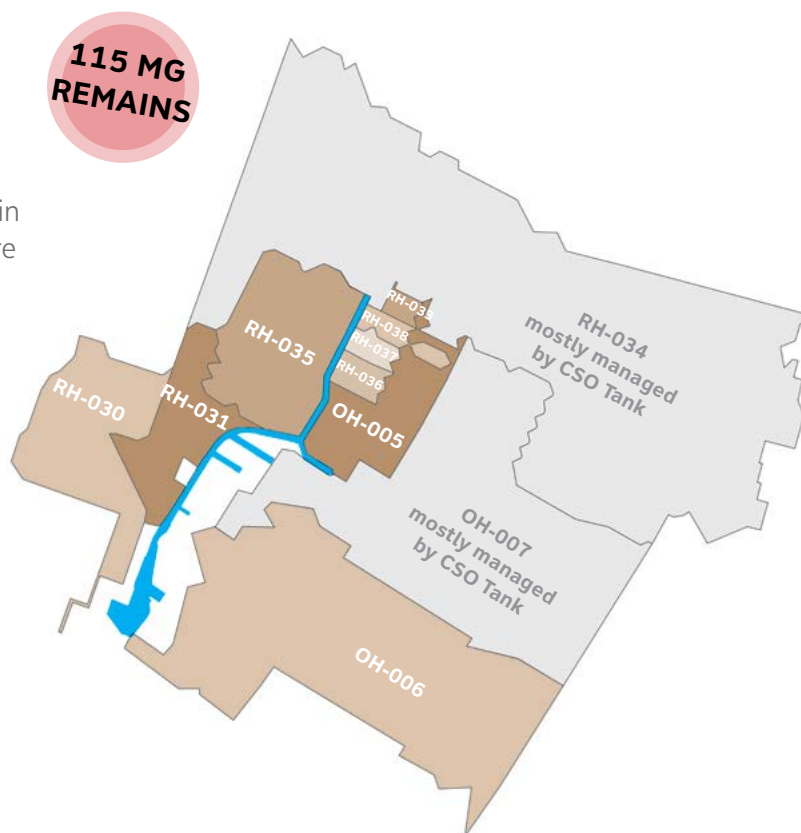


PLANNED INFRASTRUCTURE

CSO infrastructure required under the Superfund will address 80% of existing overflow from 2 CSO-sheds under existing density, leaving 115 MG of annual CSO unmanaged. Additional density will increase sewage loading in these sheds, as well as in 8 CSO-sheds that will not receive new infrastructure investment.

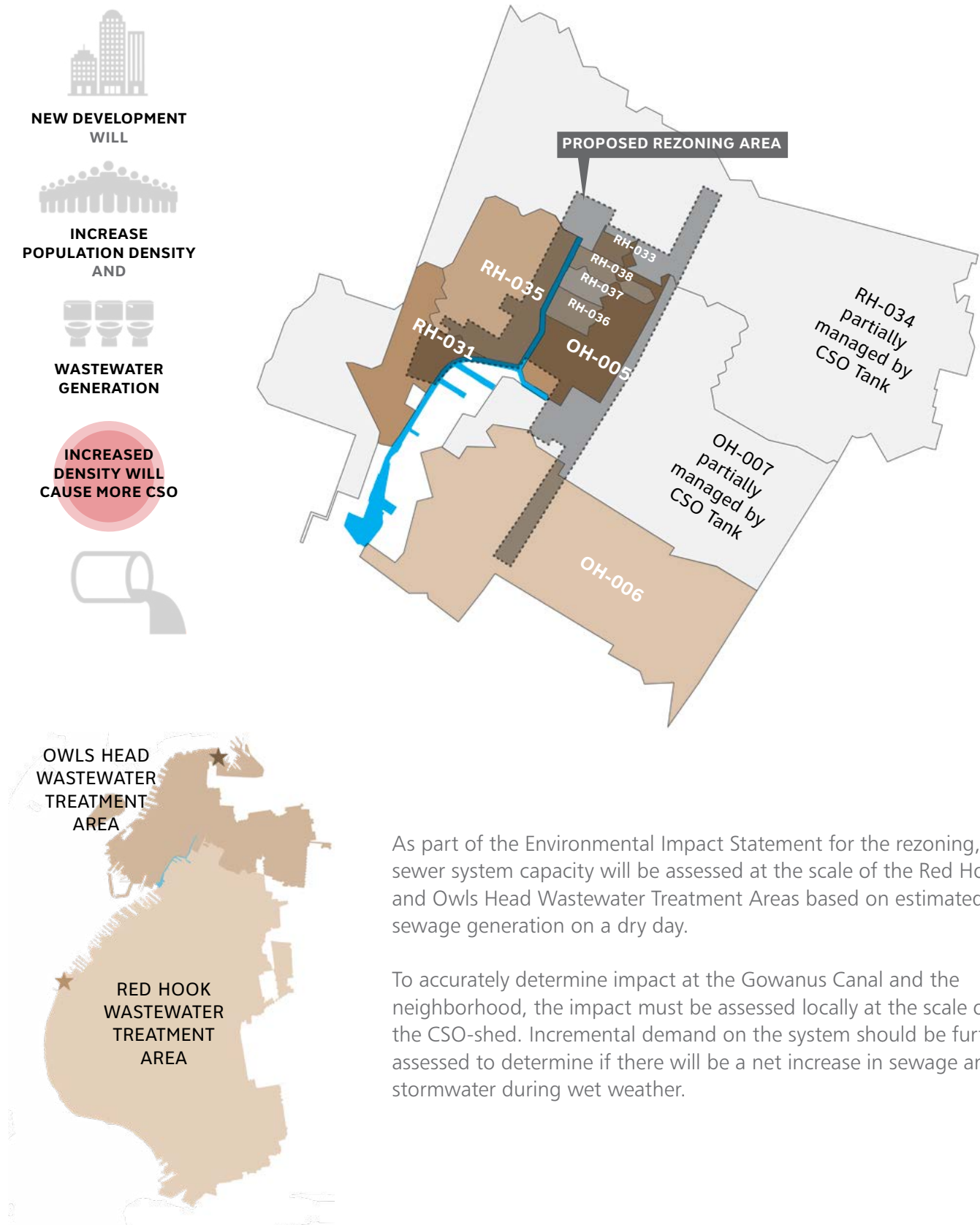


Planned grey and green infrastructure projects will reduce the amount of overflow into the Gowanus Canal. This chart displays the volume of stormwater that is or will be mitigated by grey infrastructure, green infrastructure, and what remains in order to get to ZERO CSOs during a 1.2 inch rain storm.



ZONING IMPACT ON CSO-SHEDS

The projected increase in density will add more sewage load to 10 CSO-sheds, causing more frequent overflows. The added density from the rezoning will cause a substantial increase in wastewater generation and sewage overflow into the canal. Existing and planned infrastructure investments do not address this issue.

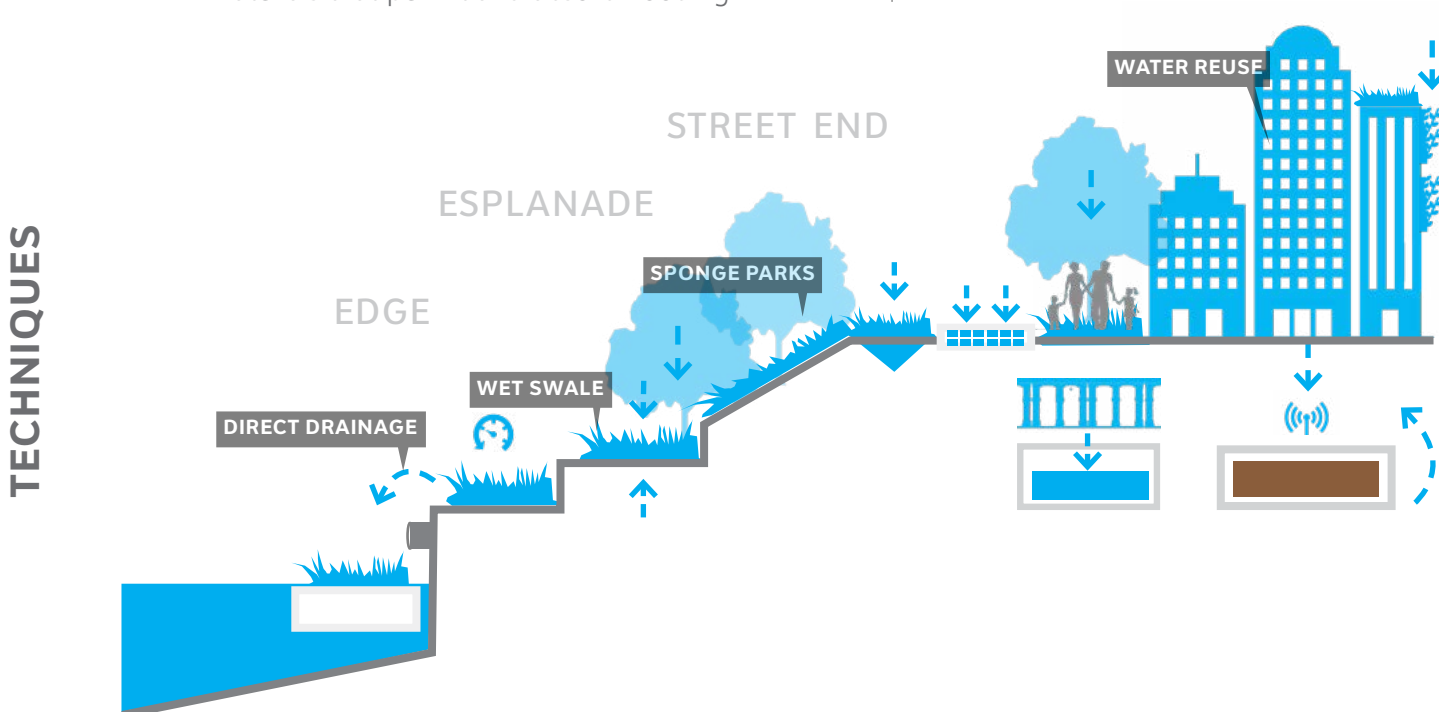


As part of the Environmental Impact Statement for the rezoning, sewer system capacity will be assessed at the scale of the Red Hook and Owls Head Wastewater Treatment Areas based on estimated sewage generation on a dry day.

To accurately determine impact at the Gowanus Canal and the neighborhood, the impact must be assessed locally at the scale of the CSO-shed. Incremental demand on the system should be further assessed to determine if there will be a net increase in sewage and stormwater during wet weather.

INTEGRATED WATER MANAGEMENT DISTRICT

STRATEGIES	WATERFRONT	IN-BUILDING
	Point source treatment: treat contamination at discharge points Flow control: minimize flow rate at discharge points Bio-infiltration: vegetated green infrastructure Storage: underground detention and retention Resilient & Responsive: landscape design and materials that permit and absorb flooding	Flow control & Storage: smart responsive stormwater systems to store and control release Reuse: treat, store, and reuse water



GUIDING PRINCIPLES

1 WATERSHED-BASED

- Evaluate and plan for projects at the watershed and CSO-shed scale using a systems approach that recognizes individual components, as well as the linkages between them.
- Mitigate the environmental impacts of new development by managing stormwater and utilizing wastewater as a resource.

2 MULTIFUNCTIONAL

- Plan for multifunctional water infrastructure that provides environmental co-benefits including heat island mitigation, energy reduction, air quality improvement, carbon sequestration, and improved biodiversity/habitat.
- Plan for multifunctional water infrastructure that provides social co-benefits including place-making, beauty, and spaces for recreation, community gathering, education, and urban agriculture.

Integrated water management considers the urban water cycle as a single integrated system, in which all urban water flows are recognized as potential resources.

IN-BUILDING	STREETSCAPE	OPEN SPACE
Conservation: reduce water use Bio-infiltration: vegetated green infrastructure	Grading & Drainage: optimize drainage patterns to redirect stormwater Flow control: minimize flow rate of stormwater entering at discharge points Bio-infiltration: vegetated green infrastructure Storage: underground detention and retention	Multifunctionality: landscape design and materials that permit and absorb flooding Storage: above and below grade detention and retention Bio-infiltration: vegetated green infrastructure

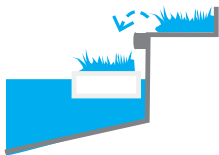
EXISTING BUILDINGS



3 ADAPTIVE	4 INNOVATIVE
• Design for the unique, natural constraints and opportunities of the Gowanus tidal estuary, including a high water table, underground creeks, coastal flooding, and historic and emergent plant communities. • Design for the diverse community and land use of Gowanus. • Plan for a changing environment, including sea level rise, increased frequency and intensity of storm events, development trends, and impacts of rezoning. • Monitor changing climatic conditions and water quality, and adapt plans to achieve goals.	• Encourage experimentation through pilot projects that support the unique character and history of making and innovation in Gowanus. • Provide alternatives to cookie-cutter solutions for addressing infrastructure needs.

POLICY & FUNDING PATHWAYS

WATERFRONT REQUIREMENTS



Promote and facilitate waterfront design strategies that improve drainage and provide stormwater detention and management.

POLICY AND FUNDING

- Waterfront Access Plan
- Street ends

NET ZERO DEVELOPMENT



New development must mitigate additional CSO through on-site adaptive building strategies that reduce wastewater volume or through additional offsite stormwater management in public space and the right-of-way.

POLICY AND FUNDING

- Mandate Net-Zero CSO for new development in conjunction with appropriate capital infrastructure
- Improve DEP Water Reuse Grant funding to include incentives for CSO reduction

NEW DEVELOPER FRONTAGES



Require all new development to install site-appropriate right-of-way green infrastructure, including suspended pavement, wet swales, and street end rain gardens, to manage a percentage of street stormwater along new frontages

POLICY AND FUNDING

- Establish Gowanus District Tree Fund, to direct payment in lieu of tree planting into district stormwater management (See Streetscapes chapter)

CITY CAPITAL INVESTMENT



Additional City capital investment in green and grey infrastructure to address CSO impact, local flooding, and sewer system capacity

- CSO Micro-Tunnels
- Additional CSO Tank Storage and Outfall Consolidation at RH-034 and OH-007
- Additional capacity for the Bond-Lorraine Sewer
- Install high-performance green and grey infrastructure in City-owned buildings, parks, and public spaces

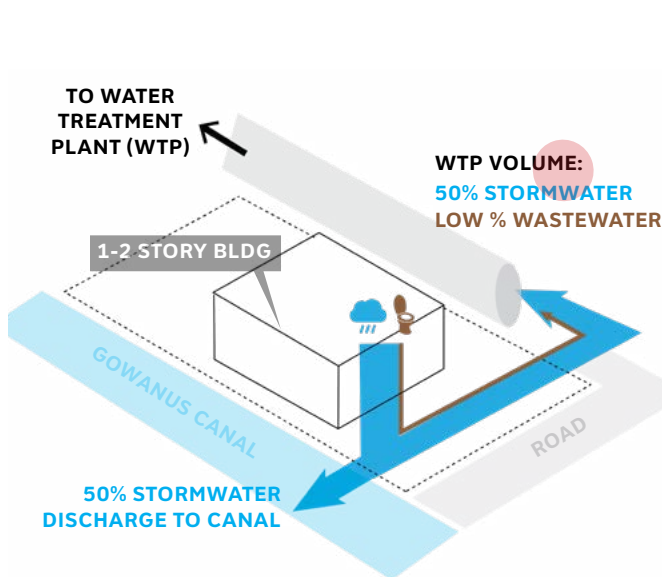
POLICY HIGHLIGHT: NET ZERO CSO DEVELOPMENT

A policy for net-zero CSO would require a site-specific mitigation strategy for new development that will ensure future stormwater and sewage loading does not exceed existing conditions. While current City regulations will require new developments to manage 90% of their on-site stormwater, additional wastewater loading will not be addressed, further contributing to and exacerbating CSO in the Gowanus Canal.

**NET
ZERO
CSO**

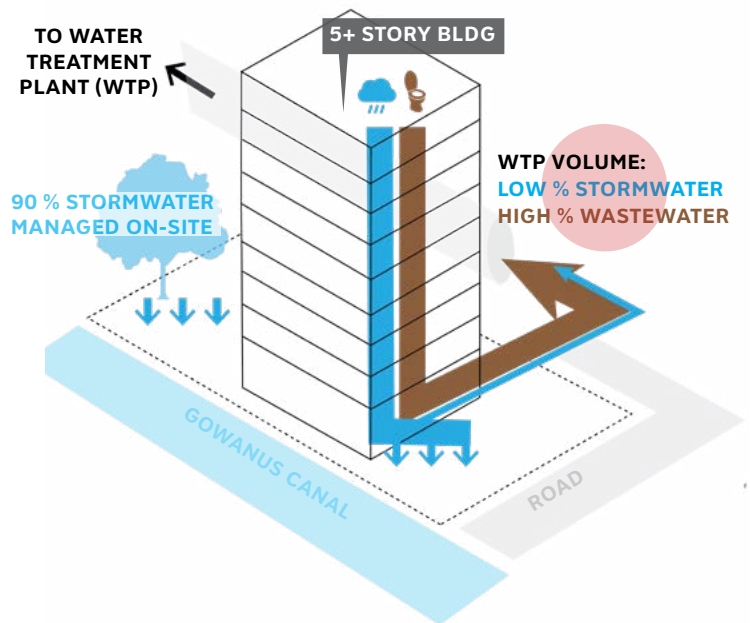
EXISTING CONDITIONS

Most existing sites in Gowanus are low density and occupied by industrial and manufacturing uses. These sites often contribute very little sewage to the system and much of their stormwater directly discharges to the canal.



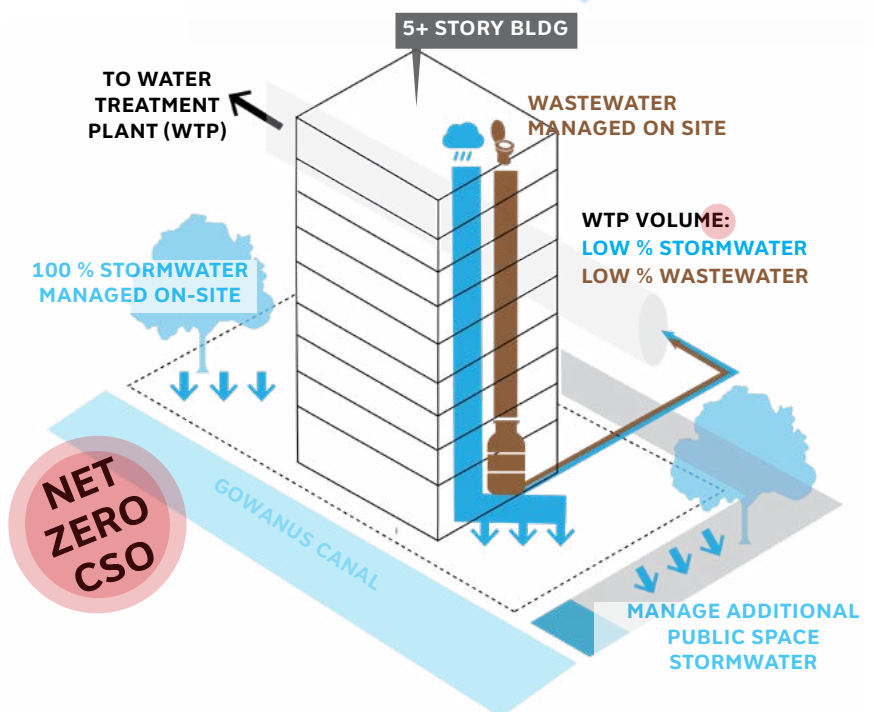
FUTURE: BUSINESS AS USUAL

Under current regulations, new development sites are required to manage 90% of their on-site stormwater but will contribute a substantial increase to overall flows to the wastewater treatment plant on a dry day. During wet weather, these increased flows will result in more frequent and concentrated CSO.



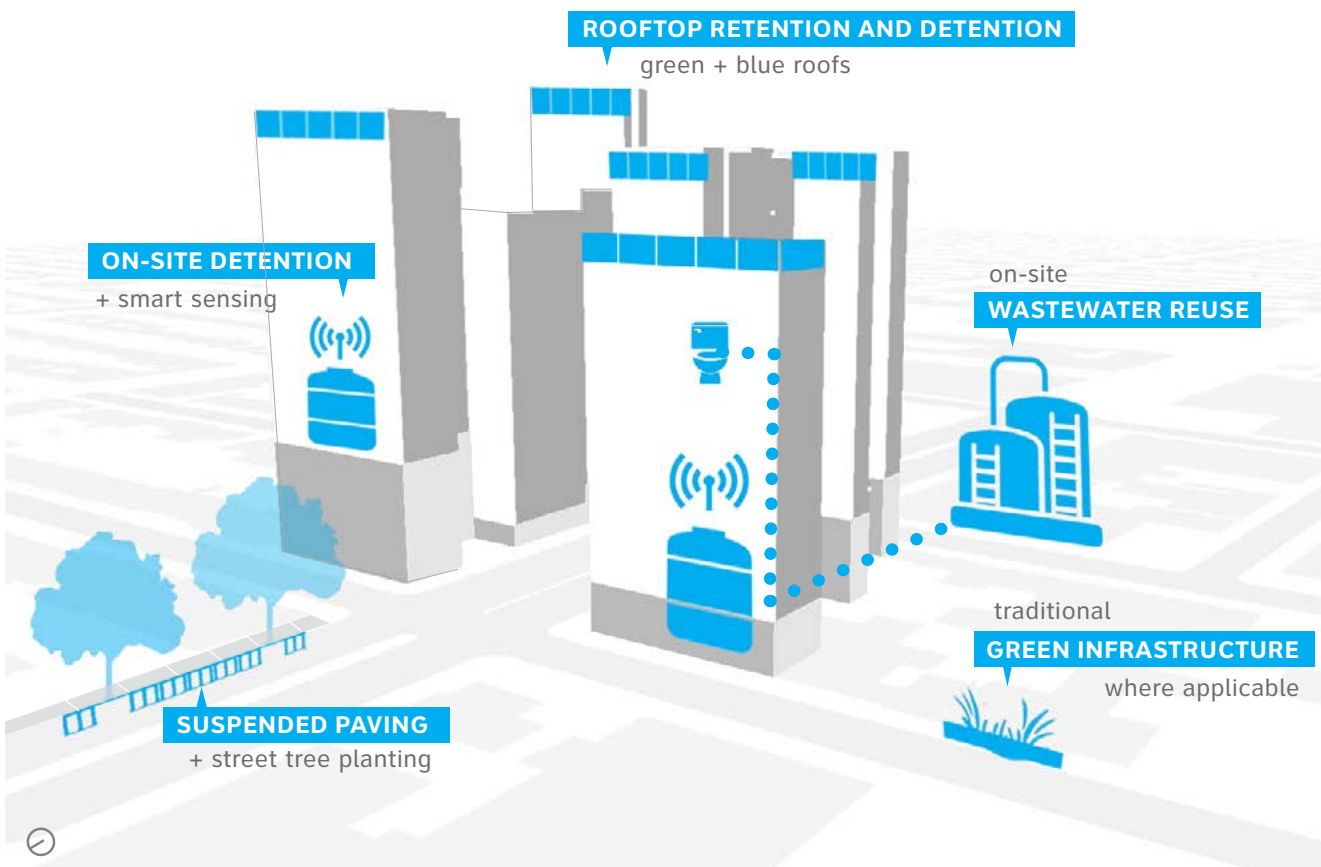
PROPOSED: NET ZERO

A net zero development would conduct impact assessment at the CSO-shed scale. Mitigation strategies must target a combination of stormwater and wastewater flows to ensure that combined flows of proposed development do not exceed existing flows to the water treatment plant.



OPPORTUNITY FOR NEW DEVELOPMENT

New development could achieve net-zero CSO with a set of integrated water management strategies that include right-of-way infrastructure and in-building management and conservation.



STEPS TO ACHIEVE NET ZERO CSO DEVELOPMENT

1

Conduct a site-based performance analysis for proposed development that incorporates local CSO-shed dynamics. If proposed water flow exceeds existing conditions, determine a mitigation strategy for increased volume.

2

Mitigation could be achieved through adaptive building solutions that target the wastewater stream through water conservation techniques, including water reuse and on-site detention.

3

Mitigation could also be achieved through an offset, or a commitment to additional stormwater management that addresses public space elsewhere in the CSO-shed through adaptive stormwater techniques.

ADAPTIVE STORMWATER STRATEGIES

Adaptive stormwater solutions acknowledge the local conditions of the Gowanus Watershed, including the historic tidal estuary, high groundwater water table, influence of underground creeks, and coastal flooding. Additionally, they are responsive to a changing environment and offer resilient solutions that provide water management now and for the future.

**See Materials & Details Chapter for further information.*

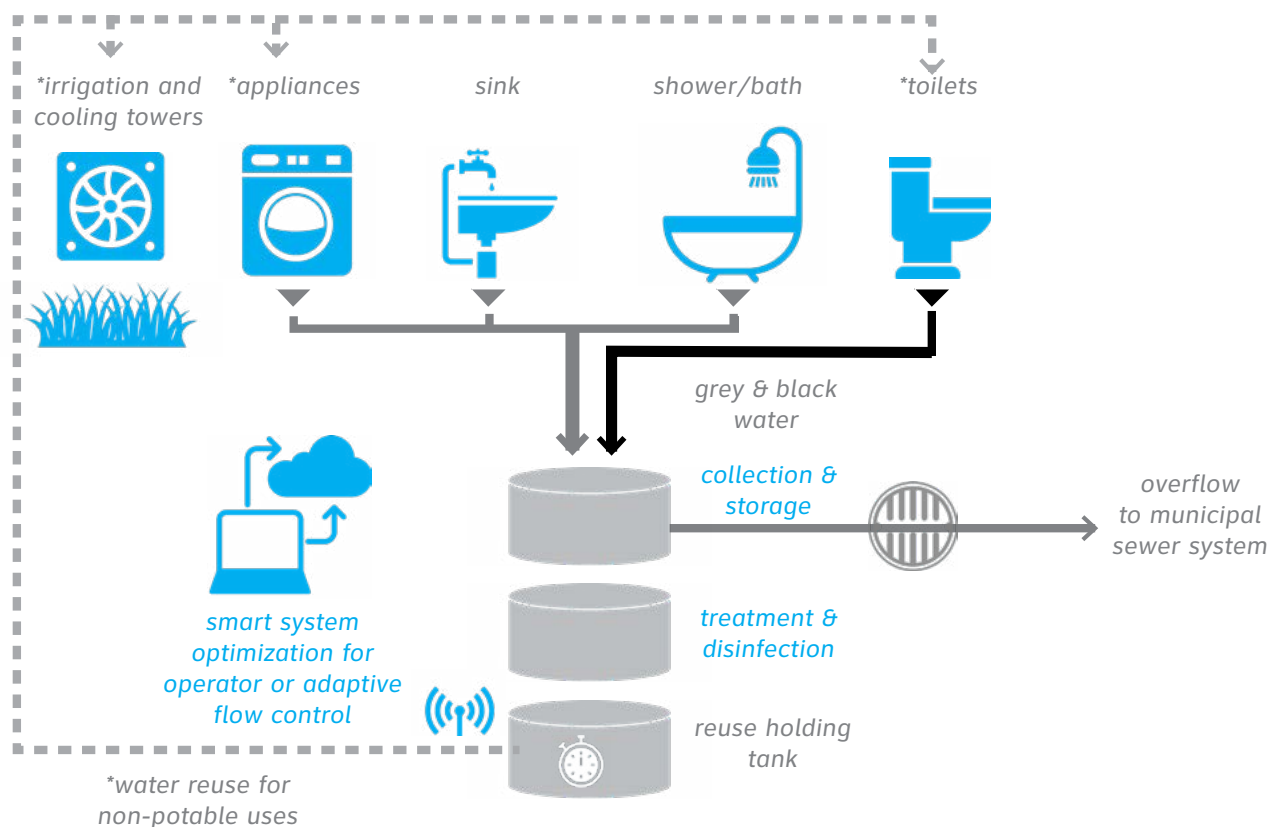


ADAPTIVE BUILDING STRATEGIES

WATER REUSE

On site water reuse systems repurpose water that would otherwise be released to the sewer system. Stormwater, as well as wastewater from showers, sinks, and toilets, is filtered and redistributed for use on the same property. Reuse systems can significantly reduce a building's water use, and can be integrated into building heating and cooling systems to reduce operational costs and environmental footprint. These systems can be funded by DEP's Water Reuse grants, and should be considered for new development.

TYPE OF WATER		TREATMENT	REUSE
BLACK WATER	water from toilets or that is likely to contain pathogens	FILTRATION & PURIFICATION membrane bio reactor system (MBR)	toilets irrigation cooling towers laundry
GREY WATER	water from sinks, dishwashers, bathtubs, other household appliances	DIVERSION no treatment PURIFICATION removal of bacteria and particulates	toilets irrigation cooling towers laundry



As blackwater reuse projects require significant infrastructure, large projects that manage several properties are more efficient and cost-effective. These systems would work well bundled on adjacent blocks, particularly along the Gowanus waterfront.

CASE STUDY: THE SOLAIRE, NYC

383,000 SF HOUSING



Reduces potable water use by over 40% with an average of 63% less sewer discharge per apartment



WASTEWATER

Black and grey water is treated using membrane bioreactor technology and used for toilet flushing and cooling.

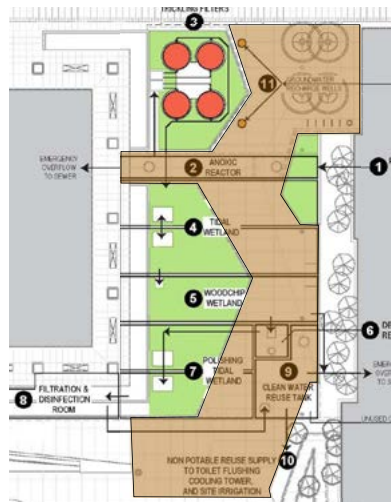
RAINWATER

Roof stormwater is stored in a 10,000 gallon tank in the basement and used in a drip irrigation system in the roof garden.

Natural Systems Utilities - <https://www.nsuwater.com/case-studies/battery-park-city/>

CASE STUDY: HASSALO ON 8TH, PORTLAND, OREGON

**592,000 SF HOUSING
31,700 SF RETAIL
26,400 SF ANCHOR RETAIL
271,000 SF OFFICE**



WASTEWATER

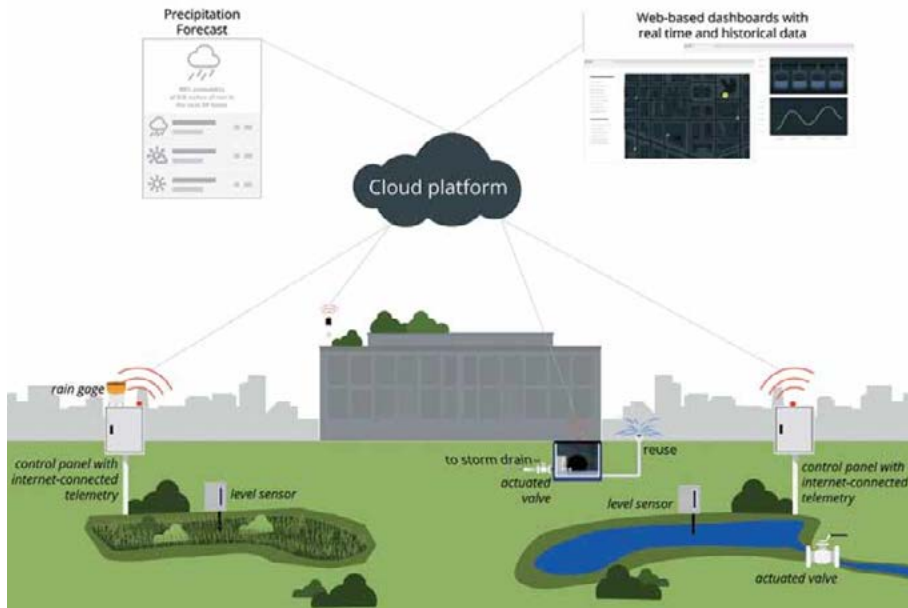
All black and grey water is treated in courtyard wetland or used for toilet flushing, cooling, and irrigation. Water fee savings will pay project off in 8-10 years.

Biohabitats - <https://www.biohabitats.com/project/hassalo-on-8th-wastewater-treatment-reuse-system-2/>

SMART WATER SYSTEMS

Continuous monitoring and adaptive control (CMAC) is a cloud-based system that uses the weather forecast to automatically control the timing and rate of flow through stormwater storage systems. These can be installed on water retention and detention assets including stormwater tanks, converting existing and often underutilized storage assets into smart, high-performing, and resilient systems.

OPTIMIZED STORMWATER MANAGEMENT



COMPONENTS:

WATER DETENTION ASSET

- Cistern
- Underground Detention Tank
- Detention Pond or Wetland

WATER-LEVEL SENSOR

- Real-time reporting on water level of a storage asset

CONTROL VALVE

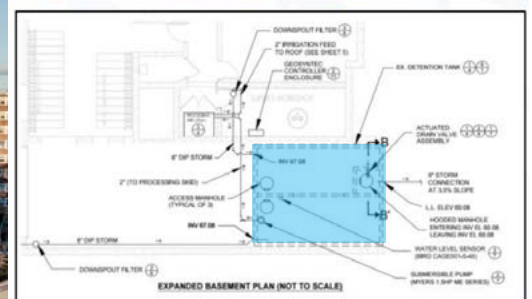
- Automated or operator controlled to open or close in response to changing water levels

INTERNET CONNECTION

- Provides forecast or real-time precipitation and cloud based control for managing integrated assets

CASE STUDY: BRONX FOREST HOUSE

STORMWATER OPTIMIZATION IN NEW CONSTRUCTION



Underground Detention Basin utilized for Rainwater Harvesting and CSO Mitigation

16,000 GAL. STORMWATER TANK
300,000 GAL. CSO MITIGATION
0.7 ACRE SITE
9-STORY AFFORDABLE RESIDENTIAL

CASE STUDY: BARCLAY'S CENTER

OPTIMIZATION OF EXISTING SYSTEM

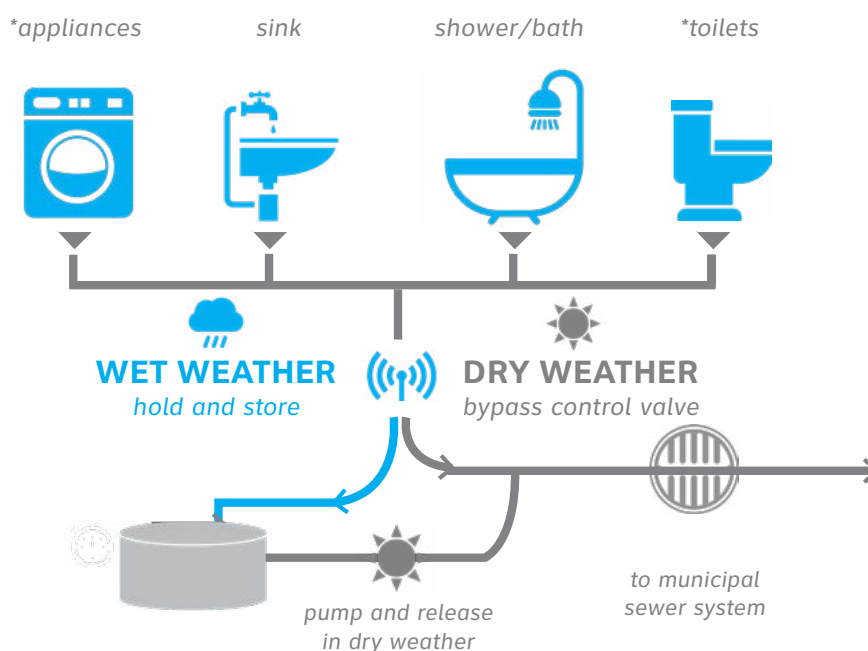
Barclay's Center, located at the north end of the Gowanus watershed, has 2 existing on-site stormwater tanks that collect runoff from a 6.8 acre drainage area, and have an estimated capacity of 495,000 gallons. In 2018, OptiRTC conducted a feasibility study for optimizing the storage potential on these assets. Installing CMAC technology would prevent approximately **9.9 MG of wet weather flow entering the combined sewer system annually** (9% CSO reduction in current annual overflow to the canal). OptiRTC is partnering with Barclay's Center and Microsoft to complete this retrofit.



OPPORTUNITY: IN-BUILDING SMART WASTEWATER CONTROL

ADAPTED FOR WASTEWATER STORAGE

In addition to stormwater, CMAC can also be adapted for temporary wastewater storage in buildings. Basement holding tanks, or oversized lift stations, can be equipped with "smart valves" that open during wet weather events to enable wastewater storage. During dry weather, stored material is pumped and slowly released through the standard connection to the municipal sewer system. During dry weather, building wastewater bypasses smart valve controls and enters the municipal system, essentially business as usual.



MAINTENANCE & PROGRAMMING

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MANAGEMENT ACROSS PROPERTIES

Public space management, including maintenance, operations, and programming, will impact how the public space in the Gowanus Lowlands is experienced. A complex matrix of private and public ownership complicates the development of a shared vision for management, while making such a vision all the more crucial.

Coordinated management across property lines will reduce overall costs and optimize performance, will allow for targeted workforce development, and will ensure that programs meet the needs of the diverse users.



A street end meets a private esplanade, a typical condition in the Gowanus Lowlands. Responsibility and standards for maintenance can vary across property lines but often maintenance needs are similar. Phragmites, pictured here, cross property lines.

MANAGEMENT COMPONENTS

HORTICULTURE + SOFTSCAPE

perennial beds, tree and shrub plantings, wetland terraces, bioretention areas, lawn areas, vegetated screens, right-of-way (ROW) street trees, ROW rain gardens

INFRASTRUCTURE + HARDSCAPE

trash, irrigation, water features, lighting, wood boardwalks, brick/stone/concrete paving, permeable pavement

PROGRAMMING

arts & culture, recreation, education

STRUCTURES

kiosks, restrooms, play equipment

SAFETY

park rangers, NYPD, or contracted security personnel

GUIDING PRINCIPLES

1 USE SUSTAINABILITY BEST PRACTICES

- Source plants and materials locally
GCC Nursery, Greenbelt Native Plant Center, Clean Soil Bank
- Compost organic materials
- Reduce and recycle non-organic materials
- Use organic soil amendments
- Use Integrated Pest Management (IPM)
- Use renewable energy when possible



Locally sourced native plants

2 CREATE SUSTAINABLE JOBS

- Prioritize local hiring: work with community organizations to promote new jobs locally
- Create year-round positions with benefits when possible
- Provide entry-level training opportunities
- Provide ongoing professional development opportunities for best practices and techniques



*Brooklyn Workforce Innovations (BWI)
Source: BWI*

3 CULTIVATE AN ENVIRONMENTAL ETHIC

- Engage residents and community members in volunteer stewardship events
- Engage students in site-based education and service learning
- Support neighborhood community gardeners, "Friends of" groups, and streetscape adopters
- Support and nurture long-term, dedicated volunteers



Volunteer Event in Gowanus

4 SUPPORT DIVERSE, ENGAGING PROGRAMMING

- Provide public programming and education that involves all residents of Gowanus and promotes social justice and community cohesion.
- Produce public art installations that showcase local talent and/or interprets the history and culture of Gowanus.



*Chelsea Wagner's "The Dreary Coast"
Source: Jeff Stark*

MANAGEMENT NEEDS & OWNERSHIP

ESPLANADES

MANAGEMENT COMPONENTS

- Horticulture + Softscape
- Infrastructure + Hardscape
- Structures
- Safety
- Programming

MANAGEMENT RESPONSIBILITY / FUNDING

Individual property owner

VISION

- Coordinate or unify for efficiencies of scale and to ensure best practices

NEW PARKS

EXISTING PARKS

MANAGEMENT COMPONENTS

- Horticulture + Softscape
- Infrastructure + Hardscape
- Structures
- Safety
- Programming

MANAGEMENT RESPONSIBILITY / FUNDING

NYC Parks / **Underfunded**

VISION

- Provide additional management
- Support management and programming by "Friends of" groups

STREET ENDS

MANAGEMENT COMPONENTS

- Horticulture + Softscape
- Infrastructure + Hardscape

MANAGEMENT RESPONSIBILITY / FUNDING

NYC DOT, DEP / **Underfunded**

VISION

- Integrate with esplanade management

STREETSCAPES

■■■■■■■■ STORMWATER CORRIDOR

--- STREET TREE CORRIDOR

MANAGEMENT COMPONENTS

- Horticulture + Softscape
- Infrastructure + Hardscape

MANAGEMENT RESPONSIBILITY / FUNDING

NYC DOT, DEP, Parks / **Underfunded**

VISION

- Provide additional management, especially for young trees and rain gardens
- Support volunteer adoption by Gowanus Tree Network

IN WATER

MANAGEMENT COMPONENTS

- Horticulture + Softscape
- Infrastructure + Hardscape
- Structures (Bridges)

MANAGEMENT RESPONSIBILITY / FUNDING

Alphabet soup (DEC, DEP, US EPA) / **No Funding**

VISION

- Provide management



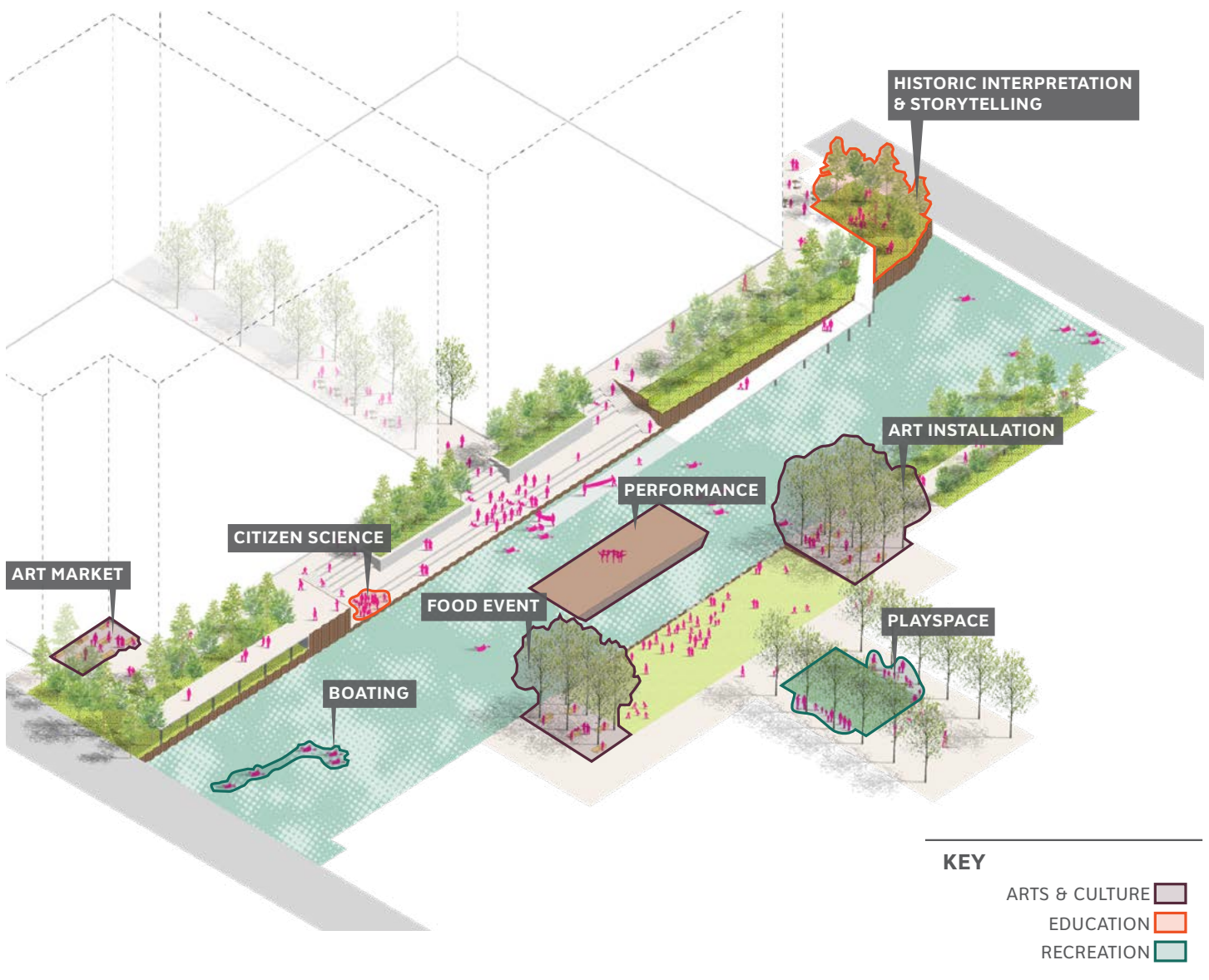
MANAGEMENT AREAS

PROGRAMMING & ACTIVITIES

Public spaces need robust programming and activities to come to life and feel welcome to diverse users. This programming should be driven by community institutions and local residents and feel accessible and responsive to those who live here.

The lists on the opposite page outline community feedback on desired programs for the public realm, which were shared during Lowlands outreach workshops. Opportunities for education, play, and water access were strongly desired along with a goal to keep public spaces dynamic through temporary installations, performance, and public art. Connecting programs to under-resourced parts of the community and providing opportunities for job training were also identified as needed. The programs are divided into three categories: Arts, Recreation, and Education.

These lists are by no means exhaustive but provide a starting point for developing community-based programming in the Gowanus Lowlands.



ARTS & CULTURE

- Art installations and curation including projections, sculpture, and temporary installations
- Live performances including music, concerts, theatre, opera, poetry readings
- Film screenings
- Intergenerational arts programs
- Inclusive arts programming driven by NYCHA residents and local artists
- Art-making
- Performance Barge for on-water performances
- Art markets
- Food events, vending, and kiosks



Artichoke Dance street performance
Photo Credit: Jeremy Amar

EDUCATION

- Water and science education
- Education barge and floating docks
- Historic interpretation and storytelling
- Job training programs
- Citizen science water quality testing
- Field Stations and Wetlab programming
- Public urban ecology programming



Citizen science water quality testing
Photo Credit: Jeremy Amar

RECREATION

- Boating
- Athletic events and sports
- Fishing
- Community gardening program
- Passive games (bingo, chess, senior activities) and activities adjacent to active spaces
- Volunteer programming
- Playspace programming



Canoeing on the Gowanus Canal

ONGOING AND PAST GOWANUS PROGRAMMING

Gowanus is home to numerous active and engaged arts and cultural organizations and individuals, who stage programs, events, and installations that give the neighborhood unique character. As the neighborhood changes, this robust grassroots engagement should be supported and expanded.

The organizations that lead this programming need dedicated and tailored space, as well as ongoing funding. The spatial needs of local groups should be considered as each new public space is designed and constructed. Funds should be provided to allow these programs to continue and expand.



Gowanus Dredgers, SuperFUN Race, Annual



Wyckoff Gardens, Community Gardening, Ongoing



Jeff Stark's The Dreary Coast, On-Water Performance, 2013



ArtBuilt, Mobile Studio in Thomas Greene Park, 2019



Old Stone House, Piper Theater Summer Youth Prog., Ongoing



Textile Arts Center, Common Threads Orchestra, 2017



Open Source Gallery, Sunbots Workshop, 2018



Friends of Thomas Greene Park, Gowanus Grind, Annual



Gowanus Green Team, Green Job Training, Ongoing



Gowanus Wildcats Performances, Ongoing



Arts Gowanus, Gowanus Open Studios, Annual

PRECEDENTS



THE HIGH LINE

SIZE = 6.7 ACRES or 291,852 SF

OPERATIONS

	COST/SF	TOTAL COST
OPERATIONS	\$21.83	\$6,372,180
PLANNING & CONSTRUCTION	\$10.89	\$3,177,825
PROGRAMMING & EDUCATION	\$9.18	\$2,680,368
ADMINISTRATION (SUPPORTING SERVICES)	\$15.61	\$4,556,072
TOTAL	\$57.52	\$16,786,445

SOURCE: Friends of the High Line Financial Statement December 31, 2016



BROOKLYN BRIDGE PARK

SIZE = 83 ACRES or 3,615,480 SF

CORPORATION

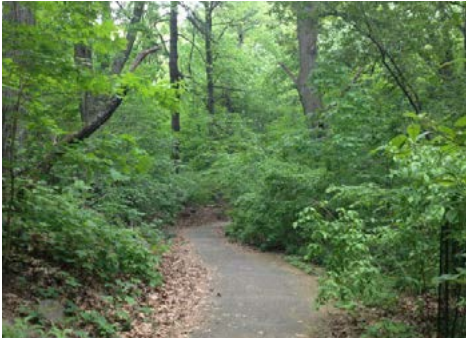
	COST/SF	TOTAL COST
PERSONNEL	\$1.39	\$5,037,011
UTILITIES, REPAIRS, MAINTENANCE, SECURITY	\$1.58	\$5,729,564
PROFESSIONAL FEES	\$0.70	\$2,540,798
DEPRECIATION & AMORTIZATION	\$4.58	\$16,562,256
GENERAL & ADMINISTRATIVE	\$0.35	\$1,254,019

} = \$2.98/SF

CONSERVANCY

PROGRAM SERVICES	\$0.55	\$1,978,313
MANAGEMENT	\$0.04	\$143,141
FUNDRAISING	\$0.11	\$406,205
TOTAL (CORPORATION + CONSERVANCY)	\$9.31	\$33,651,307

SOURCES: Brooklyn Bridge Park Corporation Financial Report Years Ended June 30, 2018 and 2017;
Brooklyn Bridge Park Conservancy 2016 Financial Report



PROSPECT PARK SIZE = 526 ACRES or 2,084,466 SF

	COST/SF	TOTAL COST
FIELD OPERATIONS & WOODLANDS	\$0.09	\$2,084,466
PUBLIC & EDUCATIONAL PROGRAMS*	\$0.06	\$1,315,054
VISITOR SERVICES & EVENTS	\$0.17	\$3,931,996
DESIGN & CONSTRUCTION	\$0.06	\$1,456,823
ADMINISTRATION (SUPPORTING SERVICES)	\$0.09	\$2,074,909
TOTAL	\$0.47	\$10,863,248

SOURCE: Prospect Park Alliance, Inc Financial Statements for the year ended June 30, 2018

*Additional programming is paid for through partnerships with BRIC (Celebrate Brooklyn) and the National Audubon Society



UNION SQUARE PARTNERSHIP

SIZE = 32 BLOCK FACES or 22,380 LF

FY 2017 EXPENSES

STREETSCAPE & BEAUTIFICATION	\$184,248 (\$8/LF)
MARKETING & PUBLIC EVENTS	\$540,038 (\$24/LF)
GENERAL & ADMINISTRATIVE	\$362,421 (\$16/LF)
SANITATION	\$1,036,601 (\$46/LF)
PUBLIC SAFETY	\$191,276 (\$9/LF)
TOTAL	\$2,464,584 (\$110/LF)

DCP CERTIFIED 1982, AMENDED 1994

NOTES: USP works with NYC Parks to maintain Union Square Park. Maintains 3 public spaces, 90 planters, and 100 tree beds.



HUDSON SQUARE CONNECTION

SIZE = 75 BLOCK FACES or 24,950 LF

FY 2017 EXPENSES

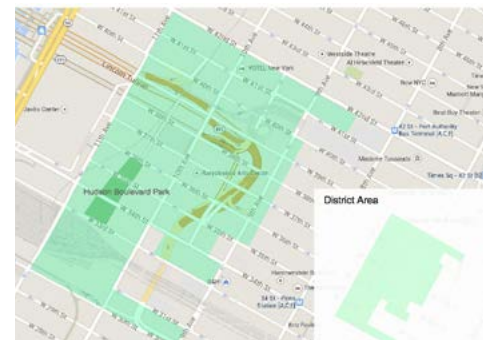
STREETSCAPE & BEAUTIFICATION	\$903,431 (\$36/LF)
MARKETING & PUBLIC EVENTS	\$668,000 (\$27/LF)
GENERAL & ADMINISTRATIVE	\$381,000 (\$15/LF)
SANITATION	---
PUBLIC SAFETY	---
TOTAL	\$4,085,809 (\$164/LF)

DCP CERTIFIED 2008, AMENDED 2018

NOTES: Maintains 5 public spaces, 30 planters and 250 tree beds.

SOURCE: FY17 NYC BID Trends Report

BUSINESS IMPROVEMENT DISTRICTS



HUDSON YARDS/HELL'S KITCHEN ALLIANCE

SIZE = 100 BLOCK FACES or 46,700 LF

FY 2017 EXPENSES

STREETSCAPE & BEAUTIFICATION	\$167,708 (\$4/LF)
MARKETING & PUBLIC EVENTS	\$36,627 (\$1/LF)
GENERAL & ADMINISTRATIVE	\$528,021 (\$11/LF)
SANITATION	\$334,157 (\$7/LF)
PUBLIC SAFETY	\$57,775 (\$1/LF)
TOTAL	\$1,390,198 (\$30/LF)*

DCP CERTIFIED 2013

NOTES: HYHKA provides maintenance for Hudson Blvd Park and the surrounding area, as well as district-wide services. Maintains 6 public spaces, 80 planters, and 200 tree beds.

*Assessment - First Year: \$1.2M Total
Cap after 5th year: \$3M



DOWNTOWN ALLIANCE

SIZE = 458 BLOCK FACES or 121,820LF

FY 2017 EXPENSES

STREETSCAPE & BEAUTIFICATION	not available
MARKETING & PUBLIC EVENTS	\$3,164,274 (\$26/LF)
GENERAL & ADMINISTRATIVE	\$1,626,503 (\$13/LF)
SANITATION	\$4,954,315 (\$41/LF)
PUBLIC SAFETY	\$4,096,341 (\$34/LF)
TOTAL	\$18,732,551 (\$154/LF)

DCP CERTIFIED 1994

NOTES: Maintains 10 public spaces and 234 planters.

SOURCE: FY17 NYC BID Trends Report

PLANTS & ECOLOGY

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CONTEXT

Gowanus was once a tidal salt marsh fed by freshwater streams from the surrounding forested hillsides that are now the neighborhoods of Park Slope, Boerum Hill, and Cobble Hill. While human settlement and industrialization resulted in environmental degradation, Gowanus still hosts a variety of plant life that includes both native vegetation in addition to plants that arrived through human transport. As the neighborhood redevelops, this characteristic Gowanus wildness should be demonstrated through the plantings in the public realm. Plantings should also provide a broad range of ecosystem services across different landscape types: habitat for wildlife, stormwater management, erosion control, carbon sequestration, and mitigation of urban heat island. These ecological goals can be achieved by designing resilient ecosystems composed of a diversity of species, allowing them to bounce back after impacts like extreme weather or human factors.

This plant palette pulls from guides of plant communities developed by the City and State, as well as from the found plant life in Gowanus, as documented during bioblitzes conducted by Gowanus Canal Conservancy in 2017, 2018, and 2019.

Sources:

Native Species Planting Guide for New York City, NYC Department of Parks and Recreation (NYC Parks), 2019
Ecological Communities of New York State, New York Natural Heritage Program (NYNHP), 2014

GUIDING PRINCIPLES

1 ESTABLISH DIVERSE, RESILIENT PLANT COMMUNITIES

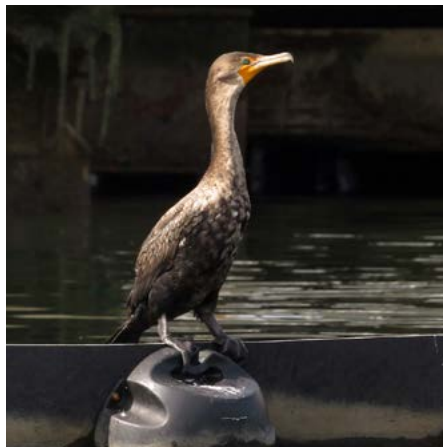
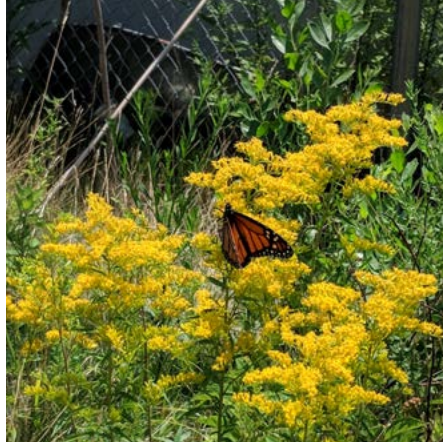
- Plant communities must tolerate a range of disturbances found in Gowanus, from storms and flooding to drought and salt to human impacts.
- All plantings should be designed and managed to evolve over time with changing conditions, including climate change and sea level rise.

2 DESIGN PLANTINGS THAT PROVIDE BROAD ECOSYSTEM SERVICES

- The Gowanus Lowlands plant palette should provide broad ecosystem services across different landscape types: habitat for wildlife, stormwater management, erosion control, carbon sequestration, and mitigation of urban heat island.

3 ENHANCE THE WILDNESS OF GOWANUS

- Build on existing wild and opportunistic plant communities in Gowanus
- Pull from analogous wild plant communities of NYC and NYS as documented in the guides developed by NYNHP (2014) and NYC Parks (2013)



BIODIVERSITY SNAPSHOT

The Gowanus Canal is home to a wide array of flora and fauna in and around the waterbody. Over 2,800 observations have been made in the survey area (see map and chart on opposite page), including over 300 plant species, over 40 bird species, and over 40 marine life species. These observations provide a species inventory at a key moment when the canal and its banks are rapidly changing due to the Superfund clean-up and new development.

Many of the species were observed during annual bioblitzes, or biological surveys, conducted by Gowanus Canal Conservancy (GCC), including events in August 2017, April 2018, and September 2019. Partners and participants included Macaulay Honors College, the Gowanus Dredgers, the Brooklyn Bird Club, and the New York Botanical Garden, as well as other experts, volunteers, and students. During a Gowanus bioblitz, teams traversed the area on foot and canoe for a set period of time (typically from 4 to 24 hours) to document their findings using iNaturalist and paper data sheets. Most of the observations can be viewed in detail on iNaturalist, a citizen science mapping application available for free on a web browser or phone app.

BIOBLITZES IN GOWANUS



Night teams survey insects using a light trap



Insect teams gather specimens with butterfly nets

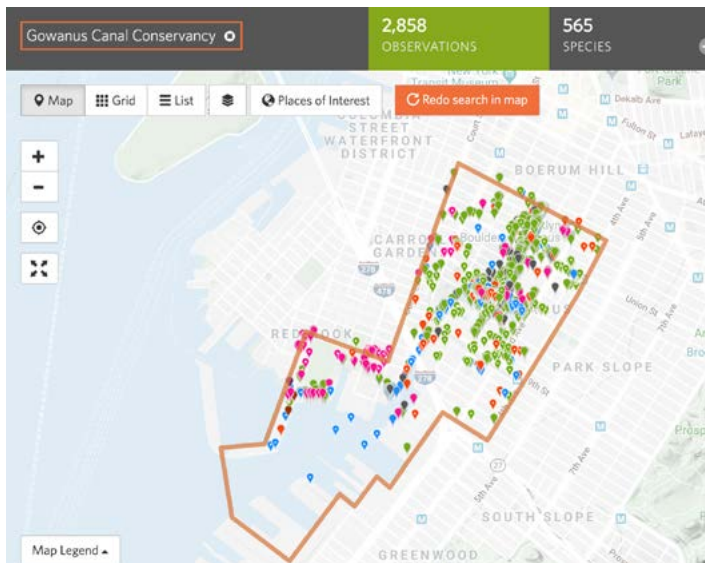


Marine life teams observe aquatic invertebrates from canoes



A plant survey team accesses wild edges from the water

SPECIES OBSERVED IN THE SURVEY AREA



Map of the survey area viewed on iNaturalist



A student finds a striped bass in the canal during the 2019 Gowanus BioBlitz with Macaulay Honors College

TAXONOMIC CATEGORY	SPECIES #	EXAMPLE SPECIES
Plant	384	Salt marsh cord grass, Groundseltree, Five-angled dodder, Milkweed, Dogbane, Eastern Cottonwood
Terrestrial Invertebrate	114	Black swallowtail butterfly, Bumble bee, Lady beetle, Monarch butterfly, Thick legged hoverfly, Zebra jumping spider
Fungus & Lichen	71	Pleated inkcap, Common greenshield lichen
Bird	43	Great blue heron, Yellow-crowned night heron, Black-crowned night heron, Double-crested comorant, Least flycatcher
Mammal	7	Racoon, Squirrel, Eastern red bat
Slime Mold	2	Wolfs milk
Marine Invertebrate	32	Atlantic blue crab, Grass shrimp, Ghost anemone, Atlantic Ribbed Mussel, Eastern oyster, Golden star tunicate, Eastern Mudsail, Northern sea squirt
Fish	7	American eel, Striped bass, Atlantic silverside
Algae	5	Rockweed
Amphibian & Reptile	2	Green frog, Common slider
Marine Life species subtotal =	46	Total of all Marine Invertebrates, Fish, Algae, Amphibians, and Reptiles
Total Species =	667	

Table includes data recorded on iNaturalist as of October 2019 within the place boundary of Gowanus Canal Conservancy combined with data recorded on paper data sheets during the 2019 Gowanus BioBlitz with Macaulay Honors College

ECOSYSTEMS

TIDAL ELEVATION < 6'



- Marine/Submerged: <-0', submerged
- Low Salt Marsh: 0-2', daily tidal inundation
- High Salt Marsh: 2'-6', seasonal tidal inundation

COASTAL ELEVATION 6'-16'



- Maritime Meadow & Shrubland: 6-16', salt spray
- Floodplain Forest: 6-16', salt spray

PLATEAU ELEVATION 16'+



- Plaza Grove/Esplanade Allee: 16'+, plaza with shaded program area
- Forest: 16'+, larger shaded program area

LAWN ELEVATION VARIES



- Lawn: high traffic, salt spray

RAIN GARDENS ELEVATION VARIES



- Well-drained Swale: 16'+, frequent run-off inundation, well-drained, root zone above ground water table
- Wet Swale: 0-16' frequent run-off inundation, poorly-drained, root zone below ground water table

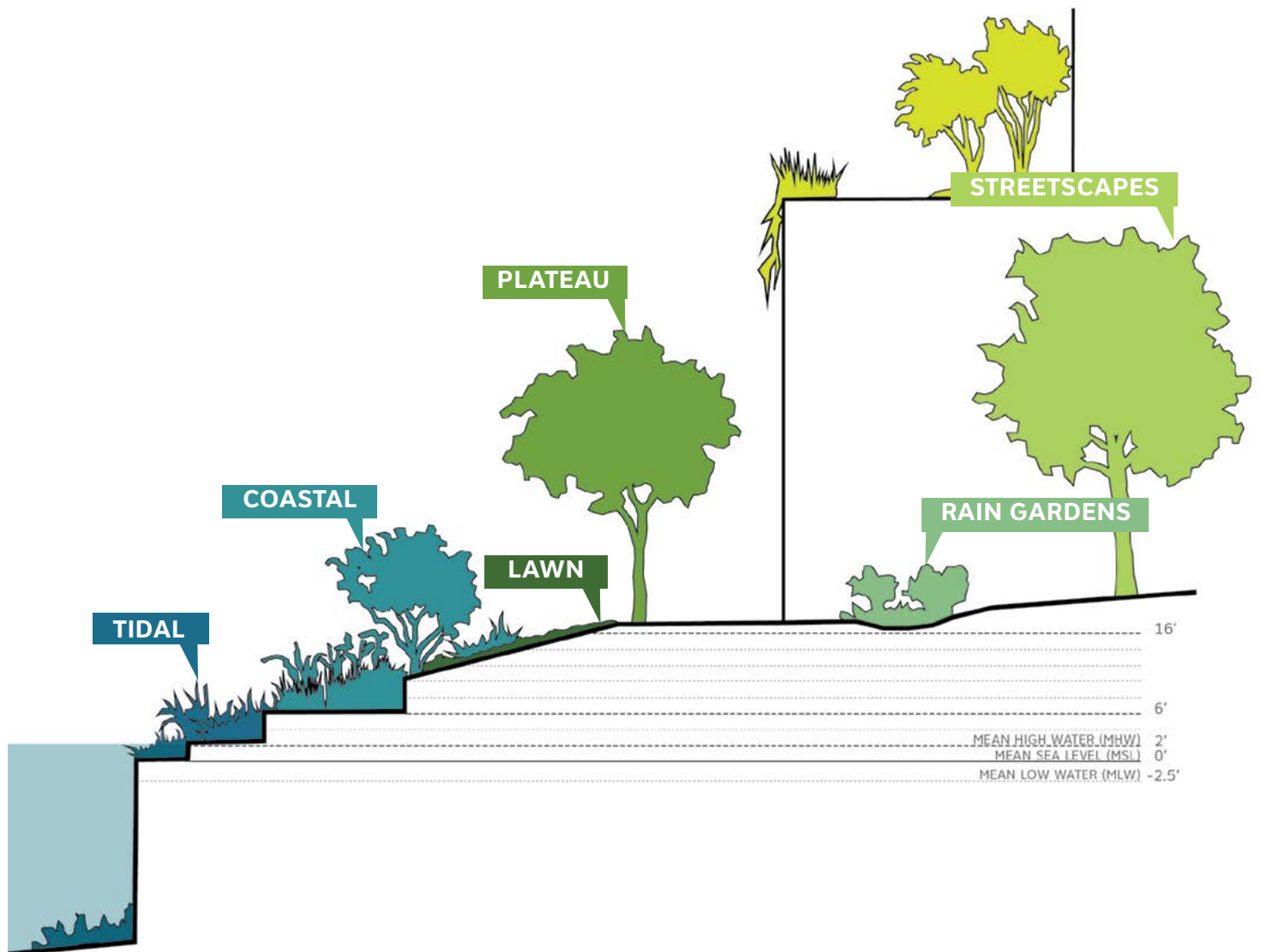
STREETSCAPES ELEVATION VARIES



- Corridor Streets: canopy trees for shade
- Mixed Use & Side Streets: wild character
- Industrial Streets: frequent run-off inundation, poorly-drained, heavy truck traffic
- Street Ends: frequent run-off inundation, poorly-drained
- Perennials: foot traffic, salt, run-off

WATERFRONT

UPLAND



Tidal Datums on NAVD88 for The Battery, NY, Source: NOAA

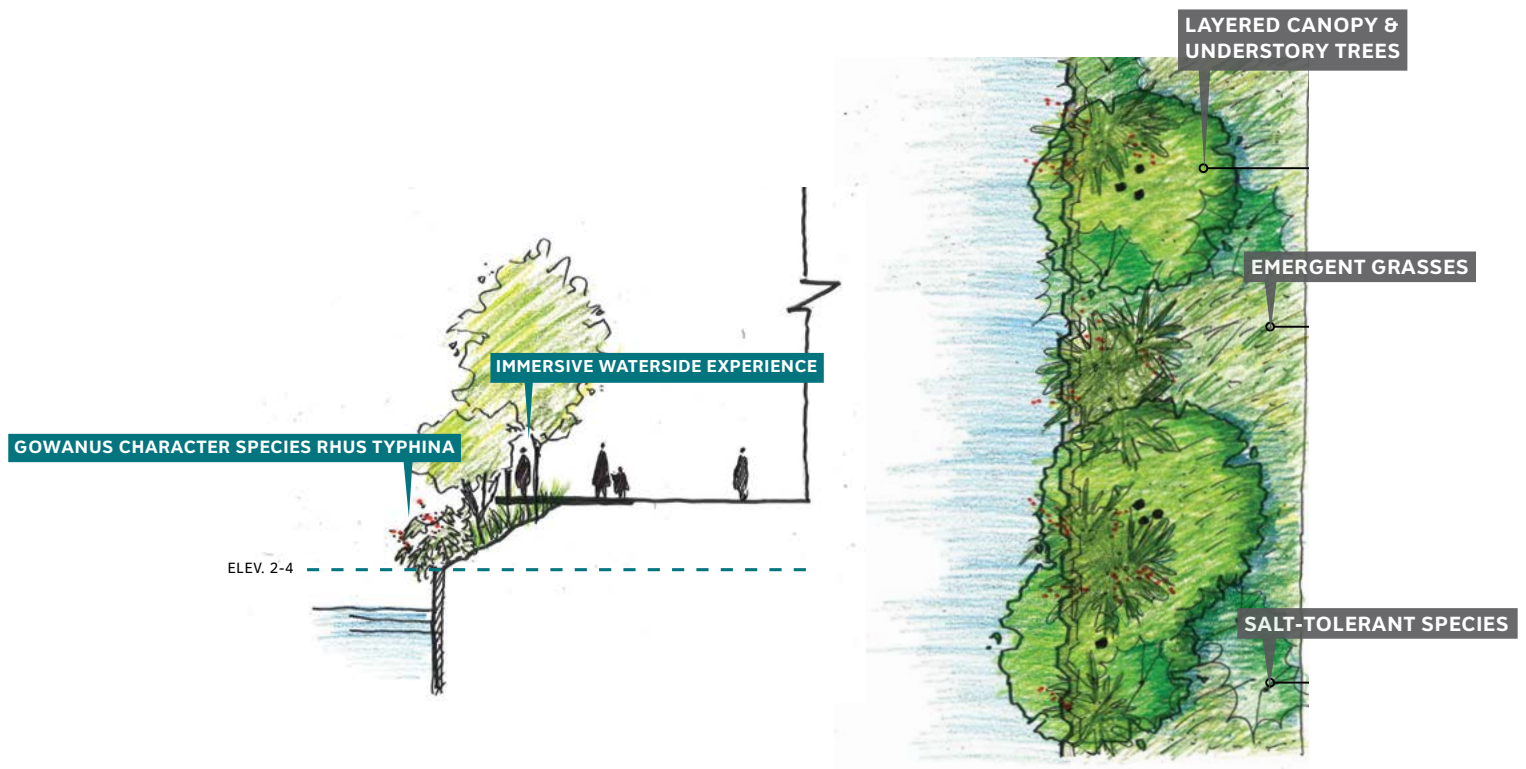


Precedent: Salt Marsh at Brooklyn Bridge Park

The tidal plant communities are characterized by salt-tolerant species, including emergent grasses and resilient shrubs, that are subjected to tidal inundation. This plant community supports marine life, such as gilled mussels, blue crabs, and striped bass, as well as birds such as herons and cormorants. Tidal ecosystems in Gowanus will be supported by constructed terraces, sedimented turning basins, floating gardens, hanging

baskets, and other bulkhead modifications (see *Materials & Details* for design details).

- | | | |
|--------------------|------|---------------------|
| • Marine/Submerged | <0' | submerged |
| • Low Salt Marsh | 0-2' | daily inundation |
| • High Salt Marsh | 2-6' | seasonal inundation |



LOW SALT MARSH

TIDAL
ELEVATION 0-2'
DAILY TIDAL INUNDATION

GRASSES, SEDGES, & RUSHES



Spartina alterniflora

HIGH SALT MARSH

TIDAL
ELEVATION 2'-6'
SEASONAL TIDAL INUNDATION

GRASSES, SEDGES, & RUSHES



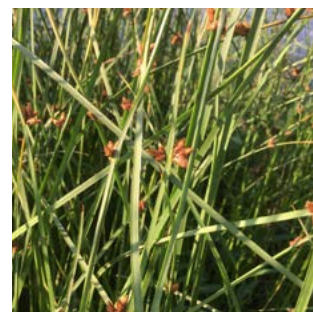
Bolboschoenus robustus



Distichlis spicata



Juncus gerardii



Schoenoplectus pungens



Spartina cynosuroides



Spartina patens



Panicum virgatum

HIGH SALT MARSH

TIDAL
ELEVATION 2'-6'
SEASONAL TIDAL INUNDATION

WILDFLOWERS



Cakile edentula



Limonium carolinianum



Salicornia depressa



Symphyotrichum
tenuifolium



Suaeda linearis



Suaeda maritima



Symphyotrichum novi-
belgii



Hibiscus moscheutos



Ptilimnium capillaceum

HIGH SALT MARSH

TIDAL
ELEVATION 2'-6'
SEASONAL TIDAL INUNDATION

SHRUBS



Baccharis halimifolia



Iva frutescens



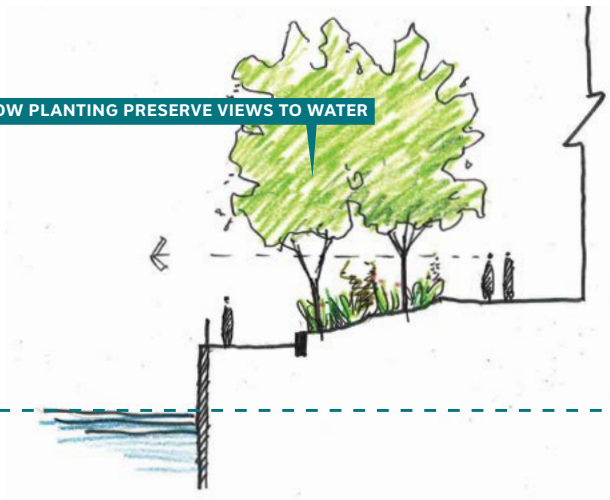
Precedent: Maritime Meadow at the Salt Lot in Gowanus

The coastal plant communities include species tolerant to salt spray, which are massed in diverse plantings that burst into color throughout the seasons. Abundant in flowering perennials and shrubs, these communities provide food and habitat for birds, bees, butterflies, and other pollinators.

- Maritime Meadow & Shrubland 6-16' salt spray
- Floodplain Forest 6-16' salt spray

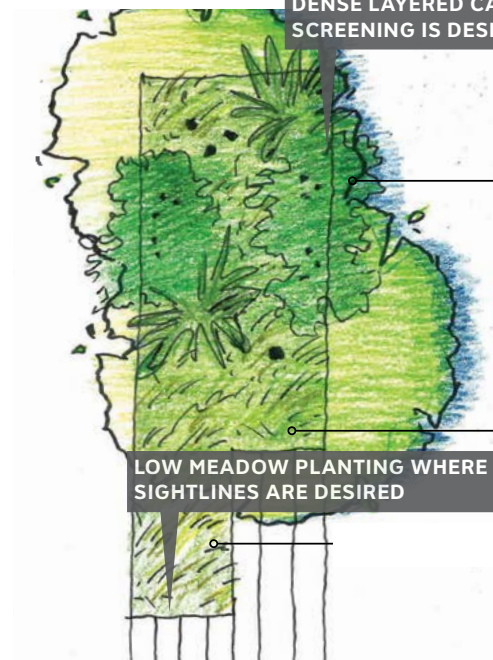
HIGH CANOPY + LOW PLANTING PRESERVE VIEWS TO WATER

M.H.W. ELEV. 2



DENSE LAYERED CANOPY WHERE SCREENING IS DESIRED

LOW MEADOW PLANTING WHERE SIGHTLINES ARE DESIRED



MARITIME MEADOW & SHRUBLAND

COASTAL
ELEVATION 6'-16'
SALT SPRAY

GRASSES, SEDGES, & RUSHES



Ammophila breviligulata



Andropogon virginicus



Sporobolus heterolepis



Aristida dichotoma



Aristida tuberculosa



Carex pensylvanica



Cyperus diandrus



Cyperus echinatus



Eragrostis spectabilis



Juncus greenei



Juncus tenuis



Muhlenbergia capillaris

GRASSES, SEDGES, & RUSHES



Panicum virgatum



Schizachyrium scoparium



Scirpus pungens



Scirpus validus



Sorghastrum nutans



Tridens flavus



Schizachyrium littorale

SHRUBS



Ceanothus americanus



Clethra alnifolia



Gaylussacia baccata



Hudsonia tomentosa



Myrica pensylvanica



Aronia arbutifolia



Aronia melanocarpa



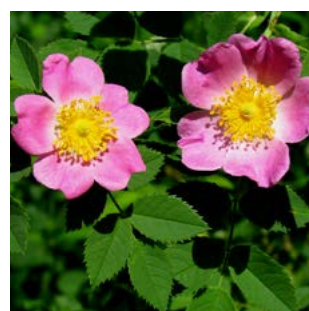
Prunus maritima



Rhus copallinum



Rhus glabra



Rosa carolina



Rubus flagellaris

SHRUBS



Rubus pensilvanicus



Sambucus canadensis



Vaccinium corymbosum

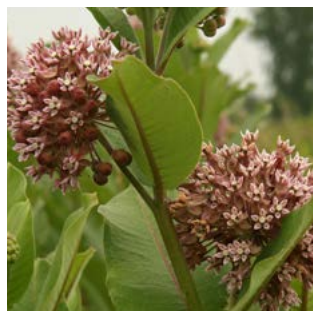


Viburnum dentatum

WILDFLOWERS



Agalinis purpurea



Asclepias syriaca



Asclepias tuberosa



Desmodium paniculatum



Eryngium yuccifolium



Eupatorium hyssopifolium



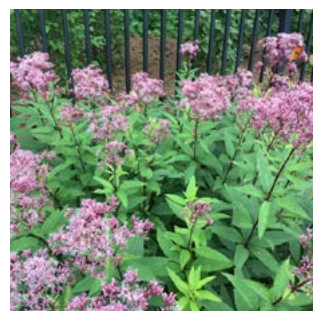
Eupatorium serotinum



Euthamia caroliniana



Euthamia graminifolia



Eutrochium dubium



Helenium flexuosum



Ioncatis linariifolius

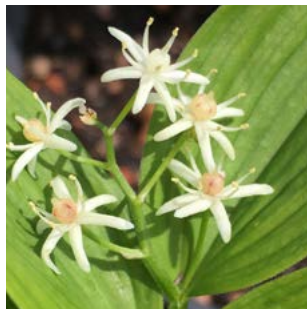
WILDFLOWERS



Lespedeza capitata



Liatris spicata



Maianthemum stellatum



Monarda fistulosa



Monarda punctata



Nuttallanthus canadensis



Oenothera fruticosa



Opuntia humifusa



Penstemon hirsutus



Plantago aristata



Potentilla canadensis



Pseudognaphalium obtusifolium

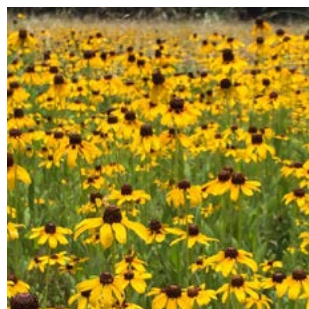
WILDFLOWERS



*Pycnanthemum
tenuifolium*



Ratibida pinnata



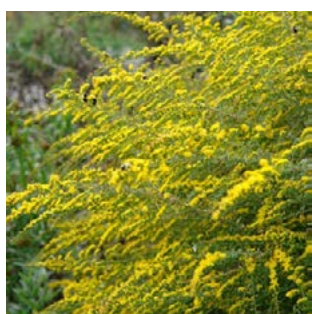
Rudbeckia hirta



Solidago nemoralis



Solidago odora



Solidago rugosa



Suaeda linearis



Suaeda maritima



Symphyotrichum ericoides



*Symphyotrichum novae-
angliae*



*Symphyotrichum novi-
belgii*



*Symphyotrichum
oblongifolium*

MARITIME MEADOW & SHRUBLAND

COASTAL
ELEVATION 6'-16'
SALT SPRAY

WILDFLOWERS



Trichostema dichotomum



Apocynum cannabinum

TREES



Acer rubrum



Amelanchier canadensis



Ilex opaca



Juniperus virginiana



Pinus rigida



Prunus serotina



Salix eriocephala



Salix nigra



Sassafras albidum

VINES



*Menispermum
canadense*



*Parthenocissus
quinquefolia*



*Strophostyles
helvola*

FLOODPLAIN FOREST

COASTAL
ELEVATION 6'-16'
SALT SPRAY

TREES



Betula nigra



Cercis canadensis



Cotinus obovatus



Juniperus virginiana



Magnolia virginiana



Precedent: Planting Grove at the Metropolitan Museum of Art

The plateau is the highest part of the esplanade, where the public space meets the building. These plant communities emphasize canopy trees that provide shade for plazas, lawns, BBQ areas, and other gathering spaces. In these areas, trees may be planted in suspended pavement or structural soil to allow for foot traffic and activities at the ground plane with stormwater capture and root zone below (see *Details &*

Materials). In larger planting areas, trees and shrubs may provide a buffer between program areas or along the face of a building.

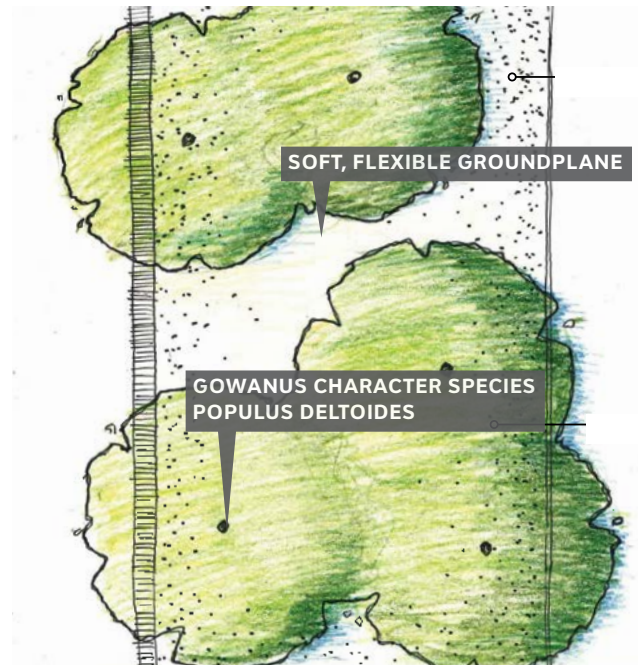
- Plaza Grove/Esplanade Allee: 16'+, plaza with shaded program area
- Forest: 16'+, larger shaded program area

GROVE WITH OPEN GROUNDPLANE
FRAMES GATHERING SPACE



SOFT, FLEXIBLE GROUNDPLANE

GOWANUS CHARACTER SPECIES
POPULUS DELTOIDES



PLAZA GROVE & FOREST

PLATEAU
ELEVATION 16'+
SHADED PROGRAM AREAS

TREES



Acer rubrum



Amelanchier canadensis



Carpinus caroliniana



Cercis canadensis



Diospyros virginiana



Gymnocladus dioica



Liquidambar styraciflua



Liriodendron tulipifera



Magnolia virginiana



Populus deltoides



Populus grandidentata



Populus tremuloides

PLAZA GROVE & FOREST

PLATEAU
ELEVATION 16'+
SHADED PROGRAM AREAS



Prunus virginiana
'Schubert'



Quercus bicolor



Quercus macrocarpa



Quercus rubra

SHRUBS



Gaultheria procumbens



Ilex glabra



Illicium x 'Woodland
Ruby'



Kalmia latifolia cultivars



Rhododendron
catawbiense



Rhododendron maximum



Rhus aromatica

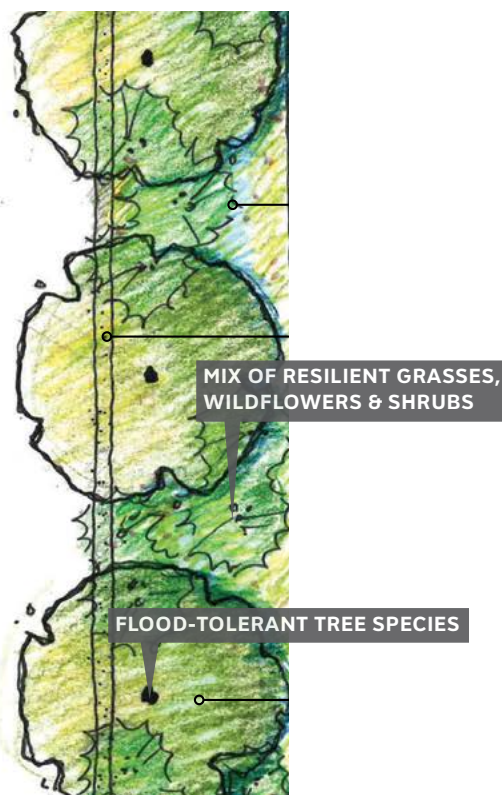
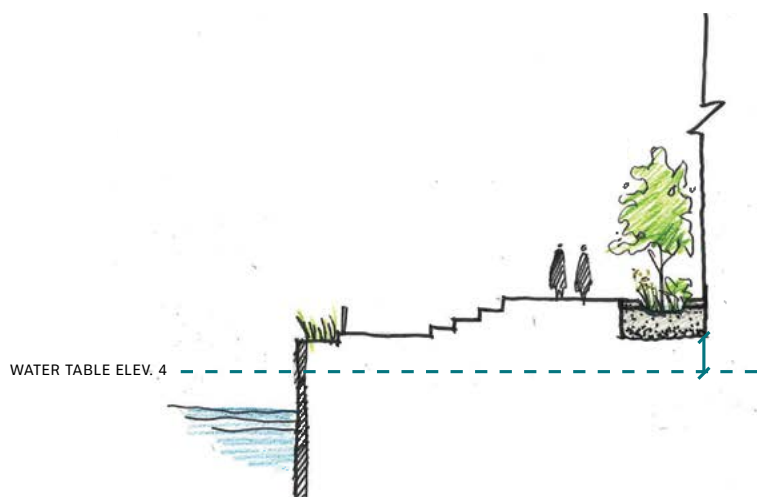


Precedent: A DEP-owned rain garden at 3rd Avenue and 3rd Street in Gowanus planted with Hibiscus, Iris and Soft rush

The plant palette in this section includes resilient species that tolerate both periodic inundation and periods of drought, as well as road salt and other run-off contaminants. This section includes two communities, one for well-drained swales with root zones above the ground water table and another for wet swales constructed at lower elevations that experience poorer drainage and longer periods of standing water.

Site analysis should be conducted at each site to determine ground water level in relation to rain garden level, which will help determine which palette to use.

- Well-drained Swale: 16'+, frequent run-off inundation, well-drained, root zone above ground water table
- Wet Swale: 0-16' frequent run-off inundation, poorly-drained, root zone below ground water table



WELL-DRAINED SWALE

RAIN GARDENS
ELEVATION 16'+
RUN-OFF, WELL-DRAINED

TREES



Amelanchier canadensis



Amelanchier laevis



Betula lenta



Betula nigra



Catalpa speciosa



Liquidambar styraciflua



Magnolia virginiana



*Metasequoia
glyptostroboides*



Nyssa sylvatica



Populus tremuloides



Quercus bicolor



Quercus phellos

SHRUBS



Aronia melanocarpa



Baccharis halimifolia



Cephalanthus occidentalis



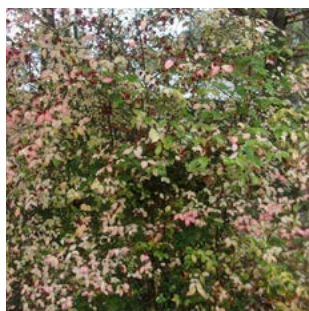
Clethra alnifolia



Cornus amomum



Cornus sericea



Euonymus americanus



Illicium x 'Woodland Ruby'



Rosa palustris



Rosa virginiana



Salix discolor



Sambucus canadensis

WELL-DRAINED SWALE

RAIN GARDENS
ELEVATION 16'+
RUN-OFF, WELL-DRAINED

GRASSES, SEDGES & RUSHES



Carex albicans



Carex amphibola



Carex pensylvanica



Juncus effusus



Panicum virgatum

WILDFLOWERS



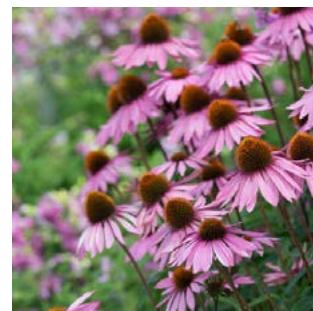
Amsonia hubrichtii



Anemone canadensis



Asclepias incarnata



Echinacea purpureum



Eutrochium dubium



Hibiscus moscheutos



Iris prismatica



Iris versicolor



Lobelia siphilitica



Monarda didyma 'Jacob Cline'



Penstemon digitalis



Verbena hastata

WELL-DRAINED SWALE

RAIN GARDENS
ELEVATION 16'+
RUN-OFF, WELL-DRAINED

WILDFLOWERS



*Veronicastrum
virginicum*



Viola sororia



Viola striata

TREES



Betula lenta



Betula nigra



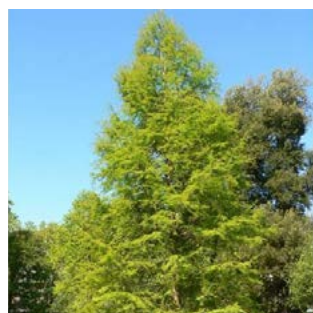
Catalpa speciosa



Magnolia virginiana



*Metasequoia
glyptostroboides*



Taxodium distichum

TREES



Betula lenta



Betula nigra



Catalpa speciosa



Magnolia virginiana



*Metasequoia
glyptostroboides*



Taxodium distichum

WET SWALE

RAIN GARDENS
ELEVATION 0-16'
RUN-OFF, POORLY-DRAINED

SHRUBS



Cephalanthus occidentalis



Clethra alnifolia



Cornus amomum



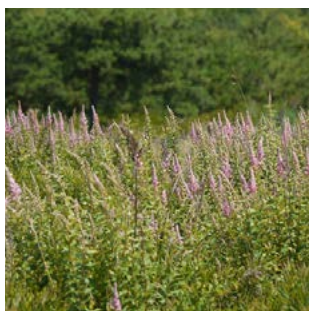
Iva frutescens



Chamaedaphne calyculata



Sambucus canadensis



Spiraea tomentosa

GRASSES, SEDGES & RUSHES



Carex amphibola



Juncus effusus



Panicum virgatum

WET SWALE

RAIN GARDENS
ELEVATION 0-16'
RUN-OFF, POORLY-DRAINED

WILDFLOWERS



Anemone canadensis



Asclepias incarnata



Eutrochium purpureum



Hibiscus moscheutos



Iris prismatica



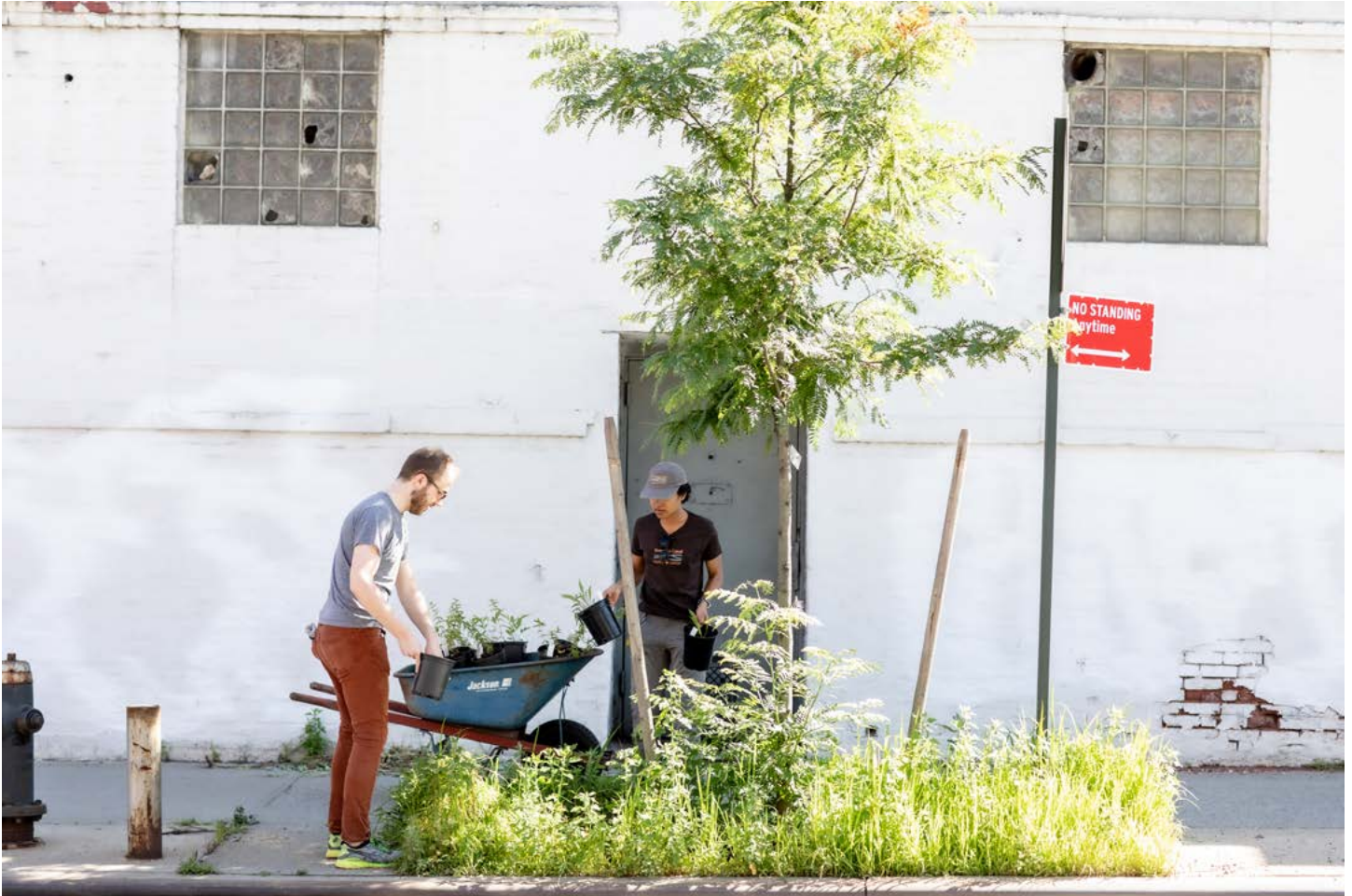
Iris versicolor



Penstemon digitalis



Verbena hastata



GCC staff and a volunteer care for a young tree and plant perennials during a tree stewardship event in Gowanus

From road salt to heavy truck traffic to flooding, street trees in Gowanus must withstand tough conditions. The species in this section have been selected for both their resilience and their character and are recommended for four different street typologies: Corridor Streets, Mixed Use & Side Streets, Industrial Streets, and Street Ends

Streetscape plant species build on recommendations from the 2017 Gowanus Urban Forest Management Plan, created by GCC in partnership with TreeKit and the NYC Department of Parks and Recreation. The plan drew on two street tree inventories completed in 2012 and 2016 to document baseline conditions for the Gowanus urban forest and illustrate a vision for the future of street trees.

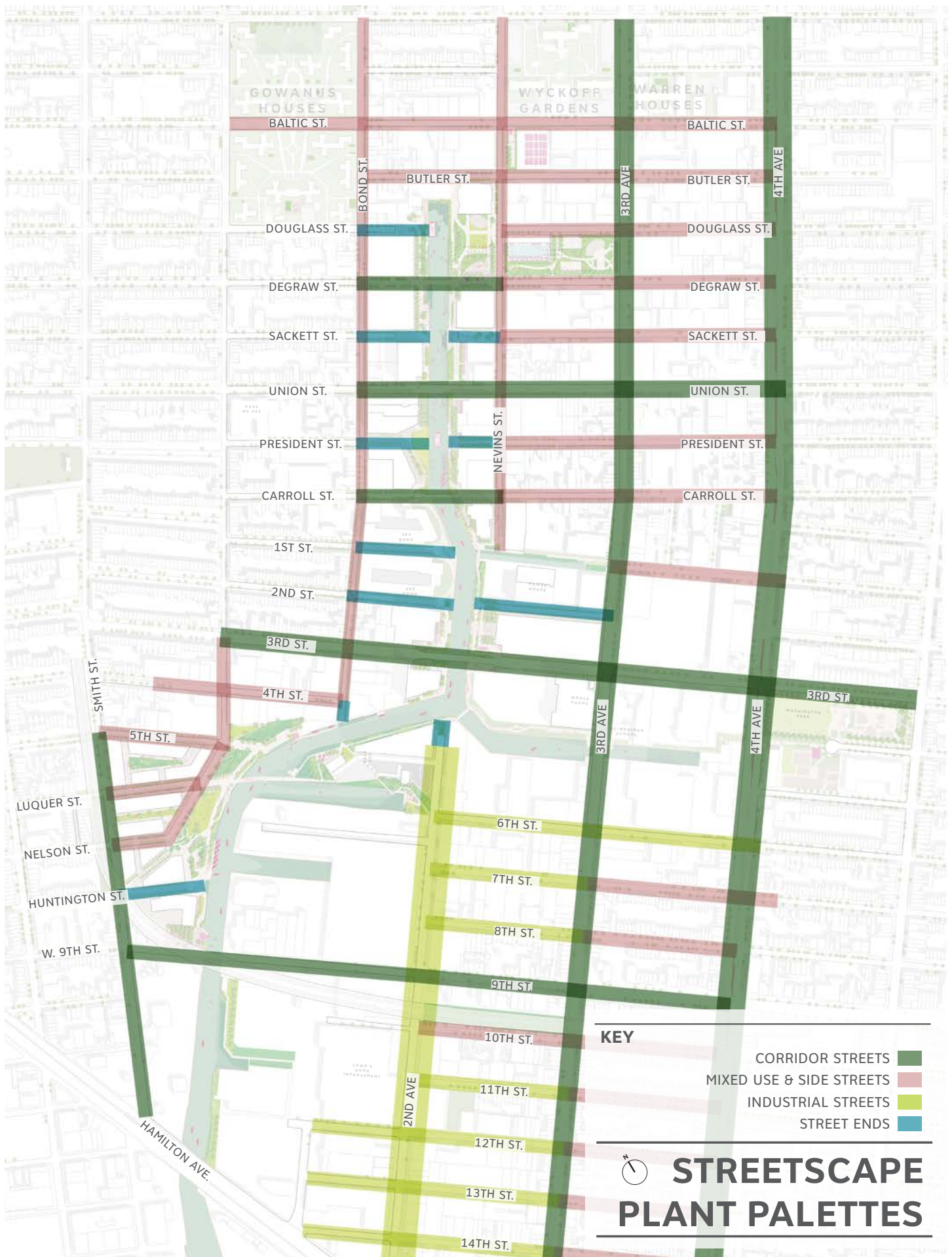
This section also pulls on perennial species survival data tracked by GCC for tree bed plantings in the neighborhood, many of which were installed by local tree ambassadors within the Gowanus Tree Network.

TREES

- Corridor Streets: canopy trees for shade
- Mixed Use & Side Streets: wild character
- Industrial Streets: frequent run-off inundation, poorly-drained, heavy truck traffic
- Street Ends: frequent run-off inundation, poorly-drained

PERENNIAL PLANTS

- Recommended for use throughout the Lowlands. Selected plant palette should account for site conditions, including sunlight, soil, and drainage.



TREES



Liriodendron tulipifera
Tulip Tree
>50'
Shade Tolerant



Liquidambar styraciflua
Sweetgum
>50'
Wet Tolerant



Quercus velutina
Black Oak
>50'



Tilia americana
American Linden
>50'
Shade, High Ph Tolerant



Quercus bicolor
Swamp White Oak
>50' *Wet Tolerant, Drought Tolerant*



Gleditsia tricanthos var. inermis
Honeylocust >50' *Salt, Drought, Wind, Wet, Pollution, High pH, Small Pit*



Catalpa speciosa
Catalpa
35-50' *Wet, Drought, Air Pollution Tolerant*



Ginkgo biloba
Ginkgo
>50' *Salt, Drought, Wind, Air Pollution, High pH, Small Pit Tolerant*



Quercus macrocarpa
Bur Oak
>50'
Drought Tolerant



Quercus muehlenbergii
Chinkapin Oak
35-50'
Drought Tolerant



Quercus rubra
Northern Red Oak
>50'
Salt, Air Pollution Tolerant



Gymnocladus dioica
Coffeetree
>50'
Drought Tolerant

MIXED USE & SIDE STREETS

STREETSCAPES
ELEVATION VARIES
WILD CHARACTER

TREES



Carpinus caroliniana
American Hornbeam
>25'
Shade Tolerant



Nyssa sylvatica
Black Gum
35-50'
Wet Tolerant



Amelanchier canadensis
Serviceberry
>25'
Wet, Shade, Small Pit
Tolerant



Cercis canadensis
Eastern Redbud
>25'
Salt, Shade, Small Pit, High Ph
Tolerant



Ginkgo biloba
Ginkgo
>50' Salt, Drought, Wind, Air
Pollution, High pH, Small Pit



Rhus typhina
Staghorn Sumac
<25' Drought, Salt, Small
Pit, Groves Tolerant



Liquidambar styraciflua
Sweetgum
>50' Wet Tolerant



Quercus macrocarpa
Bur Oak
>50' Drought Tolerant



Metasequoia glyptostroboides
Dawn Redwood
>50' Wet, Drought, High
pH, Small Pit



Quercus muehlenbergii
Chinkapin Oak
35-50'
Drought Tolerant



Tilia americana
American Linden
>50'
Shade, High Ph Tolerant



Taxodium distichum
Bald Cypress
>50'
Wet, Salt, High Wind, Small
Pit, Groves Tolerant

INDUSTRIAL STREETS

STREETSCAPES
ELEVATION VARIES
RUN -OFF, POORLY DRAINED, TRUCKS

TREES



Quercus phellos
Willow Oak
>50'
Drought, Air Pollution, Wet Tolerant



Prunus virginiana
'Schubert'
Schubert Cherry <25'
Salt, Drought, Pollution, pH, Small Pit, Shade Tolerant



Catalpa speciosa
Catalpa
35-50' *Wet, Drought, Air Pollution Tolerant*



Taxodium distichum
Bald Cypress
>50' *Wet, Salt, High Wind, Small Pit, Groves Tolerant*



Quercus rubra
Northern Red Oak
>50'
Salt, Air Pollution Tolerant



Gymnocladus dioica
Coffeetree
>50'
Drought Tolerant



Gleditsia tricanthos var. inermis
Honeylocust >50' *Salt, Drought, Wind, Wet, Air Pollution, High pH, Small Pit Tolerant*

STREET ENDS

STREETSCAPES
ELEVATION VARIES
RUN -OFF, POORLY DRAINED

TREES



Juniperus virginiana
Eastern Red Cedar
35-50'
Drought Tolerant



Taxodium distichum
Bald Cypress
>50' *Wet, Salt, High Wind, Small Pit, Groves Tolerant*



Nyssa sylvatica
Black Gum
35-50'
Wet Tolerant



Quercus bicolor
Swamp White Oak
>50'
Wet Tolerant, Drought Tolerant



Amelanchier canadensis
Serviceberry
>25' *Wet, Shade, Small Pit Tolerant*



Rhus typhina
Staghorn Sumac
<25'
Drought, Salt, Small Pit, Groves Tolerant



Cercis canadensis
Eastern Redbud
>25'
Salt, Shade, Small Pit, High Ph Tolerant



Carpinus caroliniana
American Hornbeam
>25'
Shade Tolerant



Quercus lyrata
Overcup Oak
35-50'
Wet Tolerant



Cladrastis kentukea
Yellowwood
35-50'
Grove Tolerant



Diospyros virginiana
Common persimmon
35-50'
Salt, Drought Tolerant



Magnolia virginiana
Sweet Bay Magnolia
25-35'
Wet, Groves, Shade Tolerant

PERENNIALS

STREETSCAPES
ELEVATION VARIES
FOOT TRAFFIC, SALT, RUN-OFF

GRASSES, SEDGES & RUSHES



Carex amphibola
Creek Sedge



Chasmanthium latifolium
Woodoats



Eragrostis trichodes
Sand Lovegrass



Festuca glauca
Blue Fescue



Panicum virgatum
Switchgrass



Schizachyrium littorale
Little Bluestem

PERENNIALS

STREETSCAPES
ELEVATION VARIES
FOOT TRAFFIC, SALT, RUN-OFF

WILDFLOWERS



Achillea millefolium



Agastache 'Black Adder'



Agastache foeniculum



Ageratina altissima



Amsonia hubrichtii



Anemone canadensis



Asclepias incarnata



Asclepias tuberosa



Echinacea purpureum



Eryngium yuccifolium



Eutrochium dubium



Heuchera americana
'Dale's Strain'

PERENNIALS

STREETSCAPES
ELEVATION VARIES
FOOT TRAFFIC, SALT, RUN-OFF

WILDFLOWERS



Heuchera longifolia



Iris versicolor



Liatris spicata



Monarda didyma 'Jacob Cline'



Monarda punctata



Penstemon digitalis



Pycnanthemum virginiana



Ratibida pinnata



Rudbeckia laciniata



Solidago juncea



Solidago speciosa



Symphyotrichum ericoides

PERENNIALS

WILDFLOWERS



Symphyotrichum laeve



Symphyotrichum oblongifolium



Veronicastrum virginicum



Viola labradorica



Viola sororia



Yucca filamentosa



Zizia aptera



Zizia aurea

STREETSCAPES
ELEVATION VARIES
FOOT TRAFFIC, SALT, RUN-OFF

MATERIALS & DETAILS

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CONTEXTUAL MATERIALS AND DETAILS



SIMPLE CONSTRUCTION



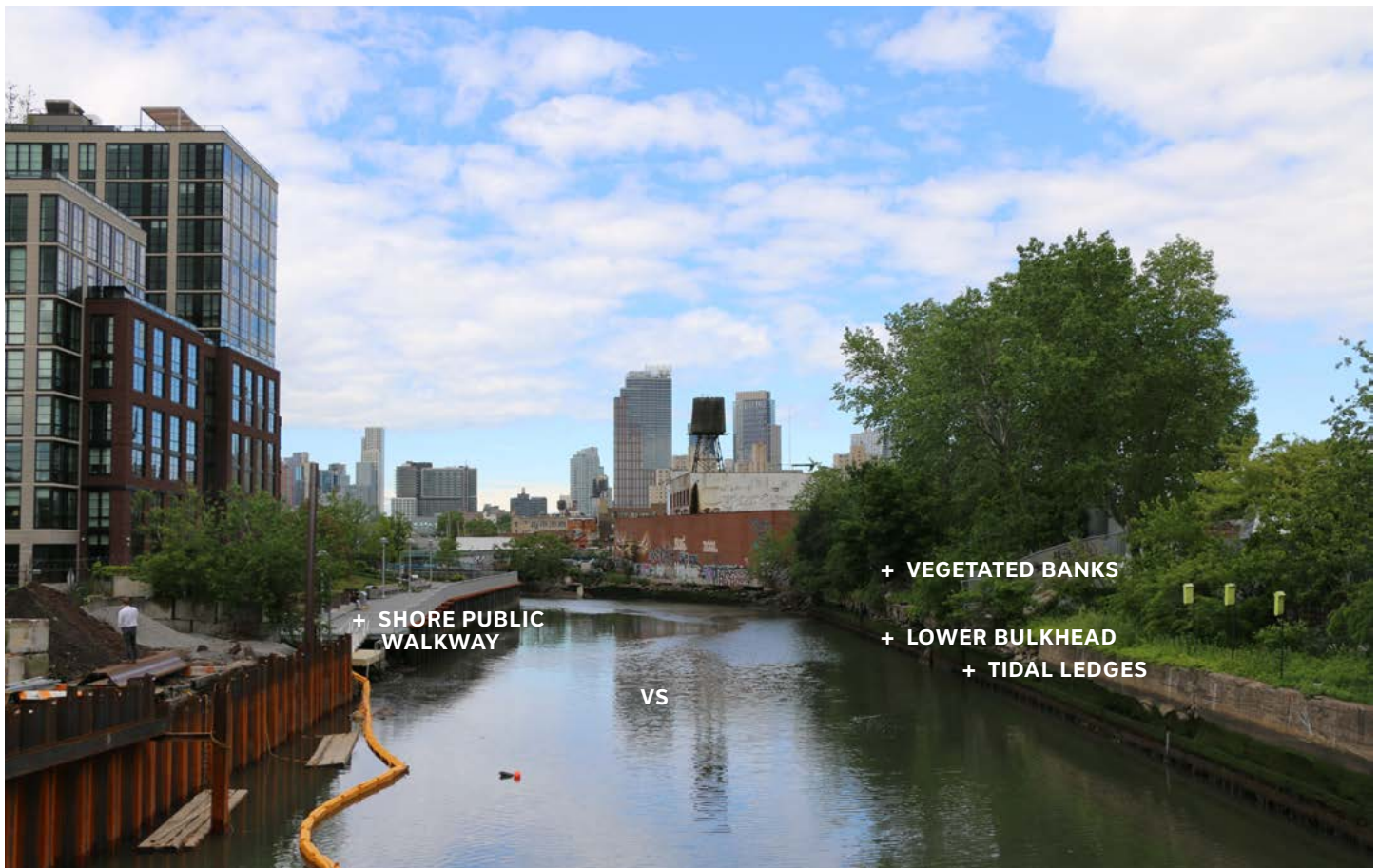
REGISTER THE VERTICAL STRUCTURES



OVERLAP



MODIFIABLE, TIED TOGETHER



HOW CAN PUBLIC SPACES INTERPRET CONTEXT?

In order to celebrate and reinforce the unique character of Gowanus, the following pages begin to outline design details and a material palette for site furniture, paving patterns and materials, railings, lighting fixtures, benches, trash cans, bike racks, signage, and tree guards for use on waterfront esplanades, plazas, parks and streets.

The materials and details which follow use locally relevant materials, make use of industrial patterns, and use a collage of contextual materials, while remaining flexible enough to allow for varying combinations for use by property owners and the City.

GUIDING PRINCIPLES

CELEBRATE & ENHANCE THE UNIQUE CHARACTER OF GOWANUS

- Pull from existing materials, textures, patterns, and forms for new materials
- Re-purpose historic materials when possible

USE LOCAL, DURABLE AND ECOLOGICALLY SOUND MATERIALS

- Use recycled materials
- Locally source materials when possible

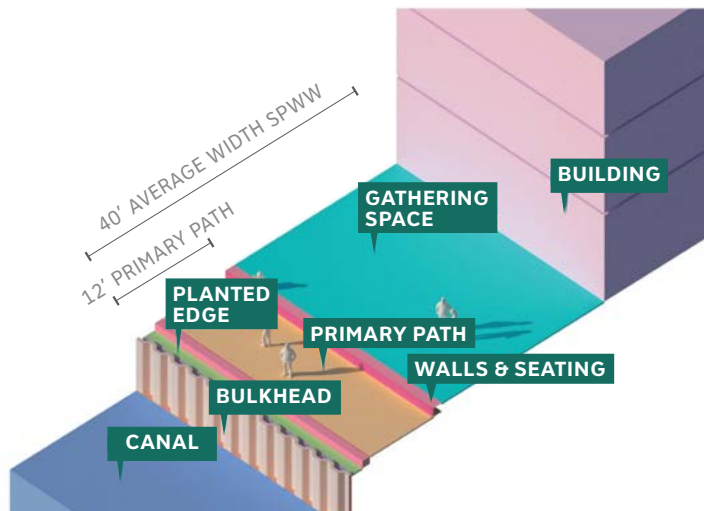
TYPICAL ESPLANADE LAYOUTS

The following pages show schematic layouts for multi-level esplanades to meet waterfront zoning requirements, and provide high pathways above flood elevations as well as low pathways, get downs, and planted areas that improve drainage, accessibility, and habitat. The potential design drawings show how the material palette can be collaged across these layouts.

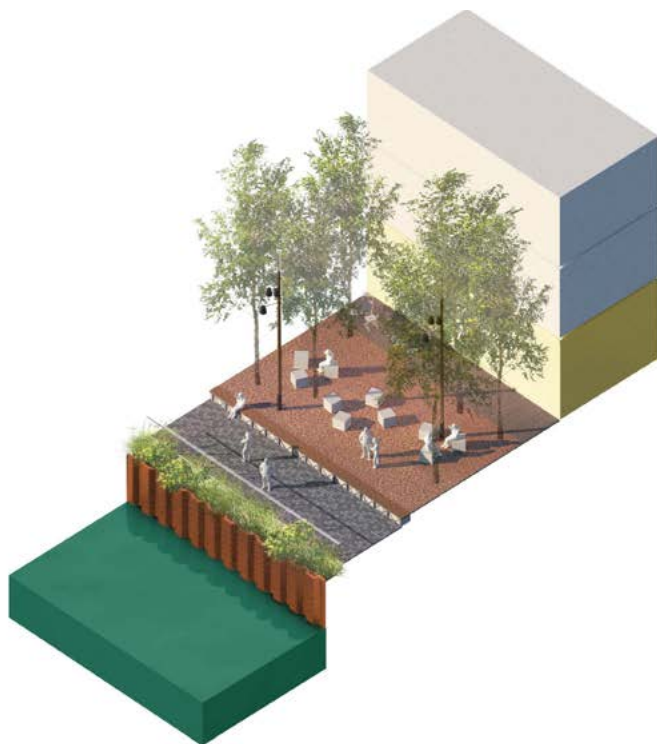
1 LOW PRIMARY PATH

The low primary path layout allows for engagement with the water as well as a large gathering space near the building. With room for larger programmed spaces, this layout can accommodate seating groves, BBQ areas, play spaces, and cafe seating. Spaces are delineated with seat walls or benches. Low plantings along the bulkhead edge allows for cascading plant material and provide for intertidal habitat.

LAYOUT & COMPONENTS



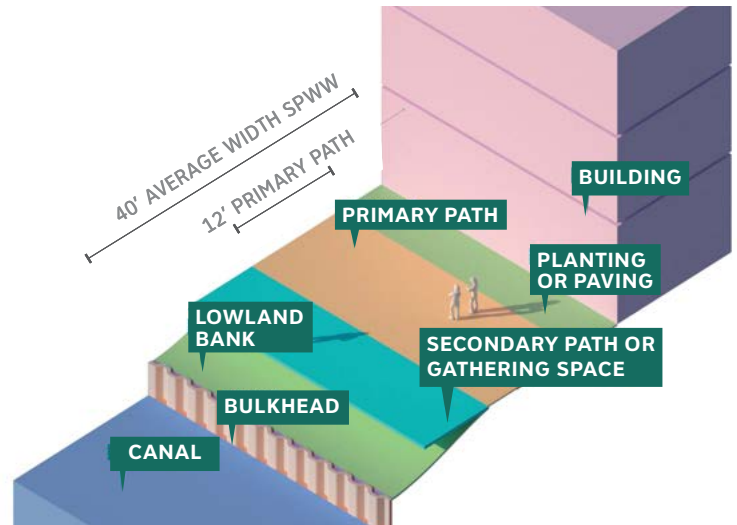
POTENTIAL DESIGNS



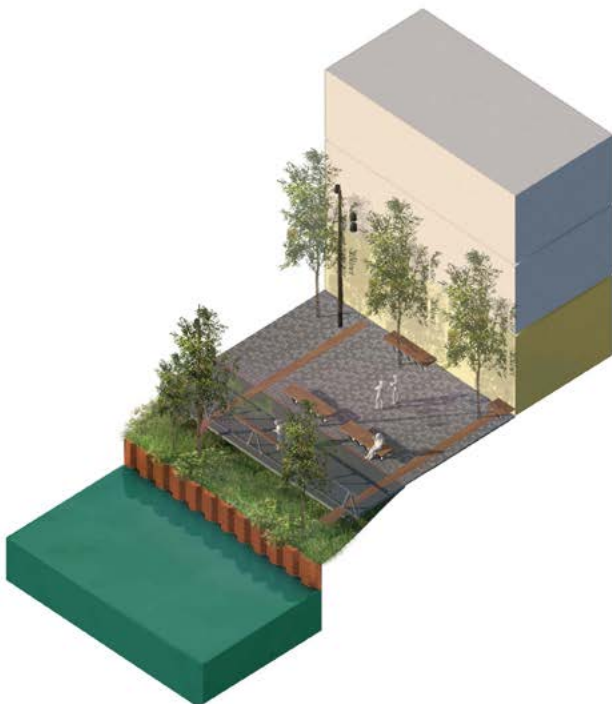
2 HIGH PRIMARY PATH

A high primary path creates a pedestrian corridor near the building. While there may be less engagement with the water in this layout, there is opportunity for a generous planting area along the water. There is also the option for a secondary path or small gathering space closer to the water.

LAYOUT & COMPONENTS



POTENTIAL DESIGNS

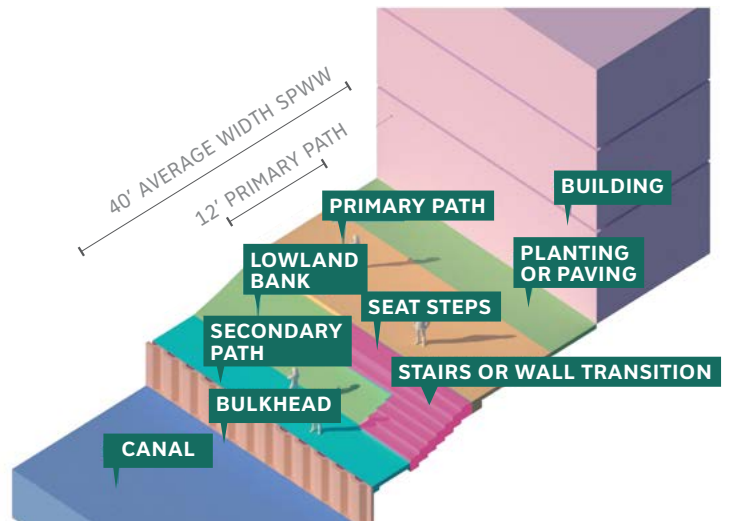


TYPICAL ESPLANADE LAYOUTS

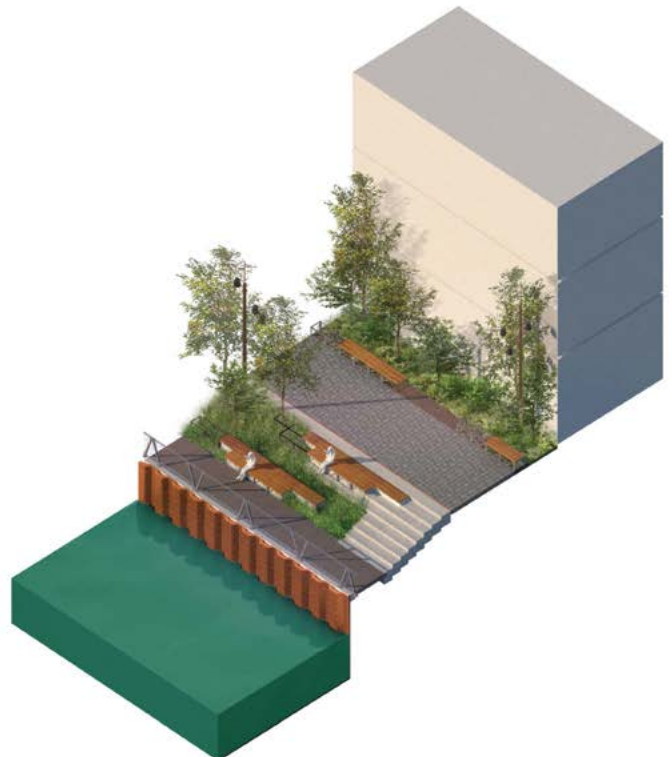
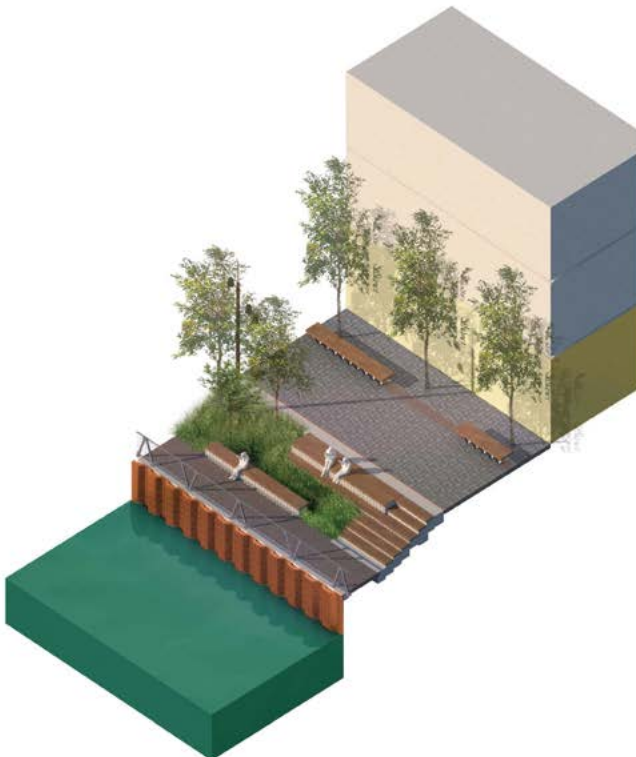
3 SPLIT-LEVEL ESPLANADE

The split-level esplanade layout maximizes potential for pedestrian movement while creating a varied topography along the esplanade. This allows for a high path near the building as well as engagement with the water. Transition between the two levels is made through slopes, planting, seat steps, stairs, and retaining walls.

LAYOUT & COMPONENTS



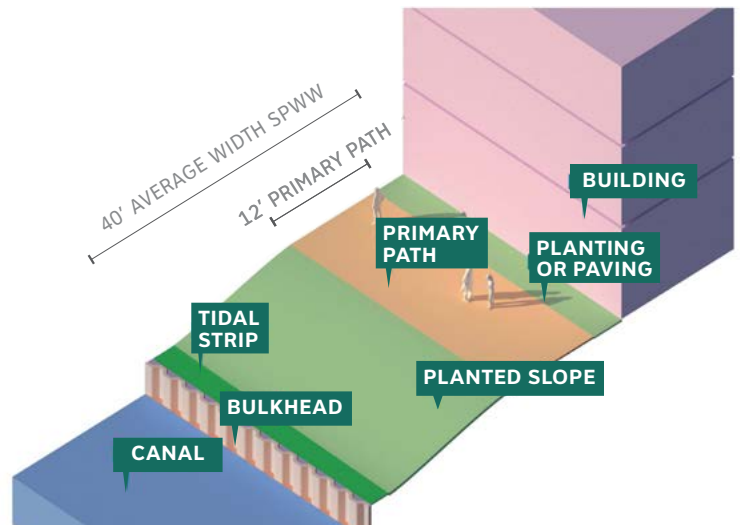
POTENTIAL DESIGNS



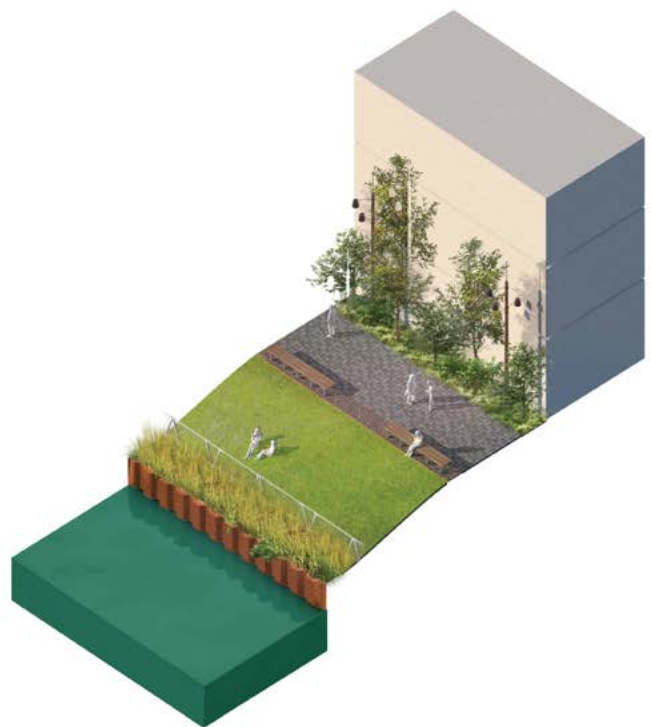
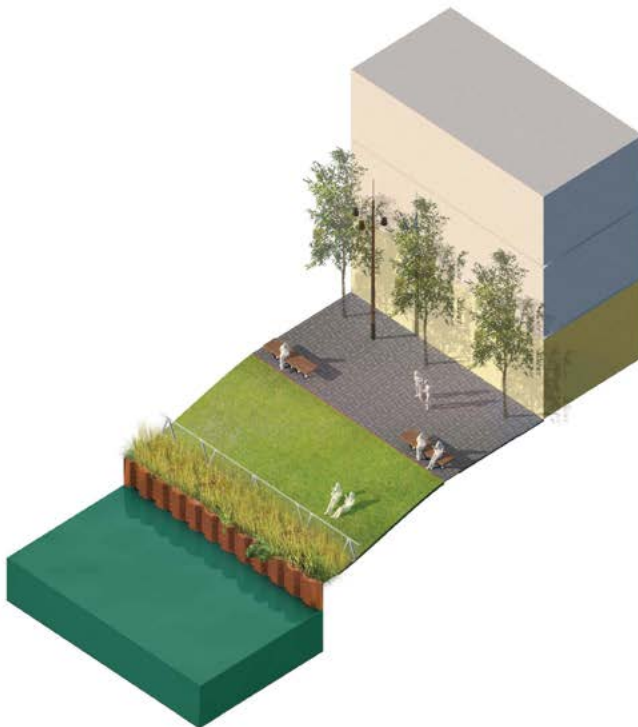
4 PLANTED SLOPE

The planted slope layout allows for an expansive viewing lawn or large planting area with a primary path adjacent to the building. In this layout a tidal strip along the bulkhead edge creates intertidal habitat.

LAYOUT & COMPONENTS

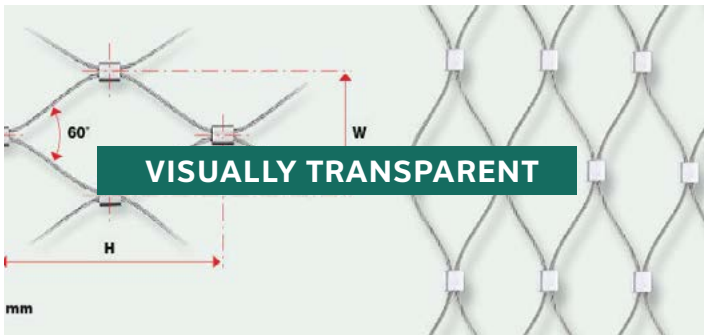
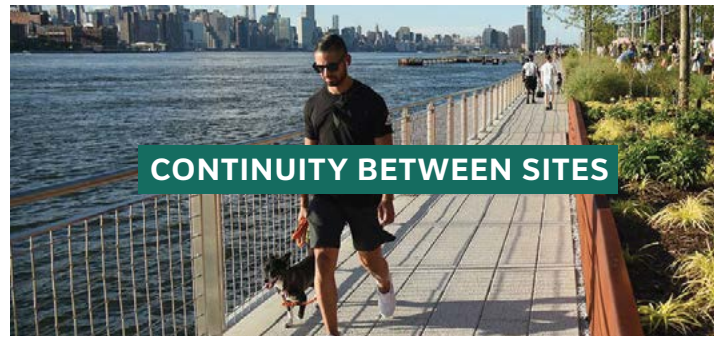


POTENTIAL DESIGNS



RAILINGS

CONCEPT

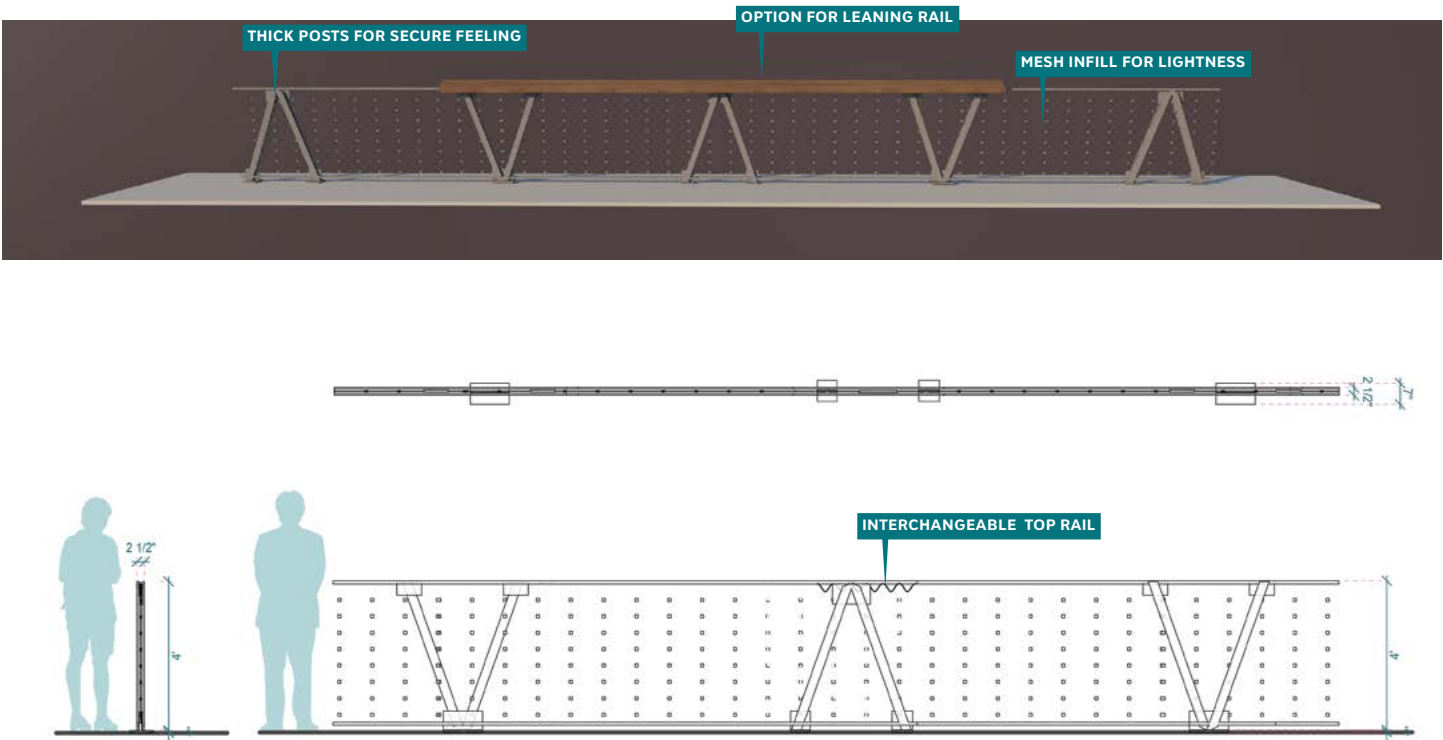


RENDERING

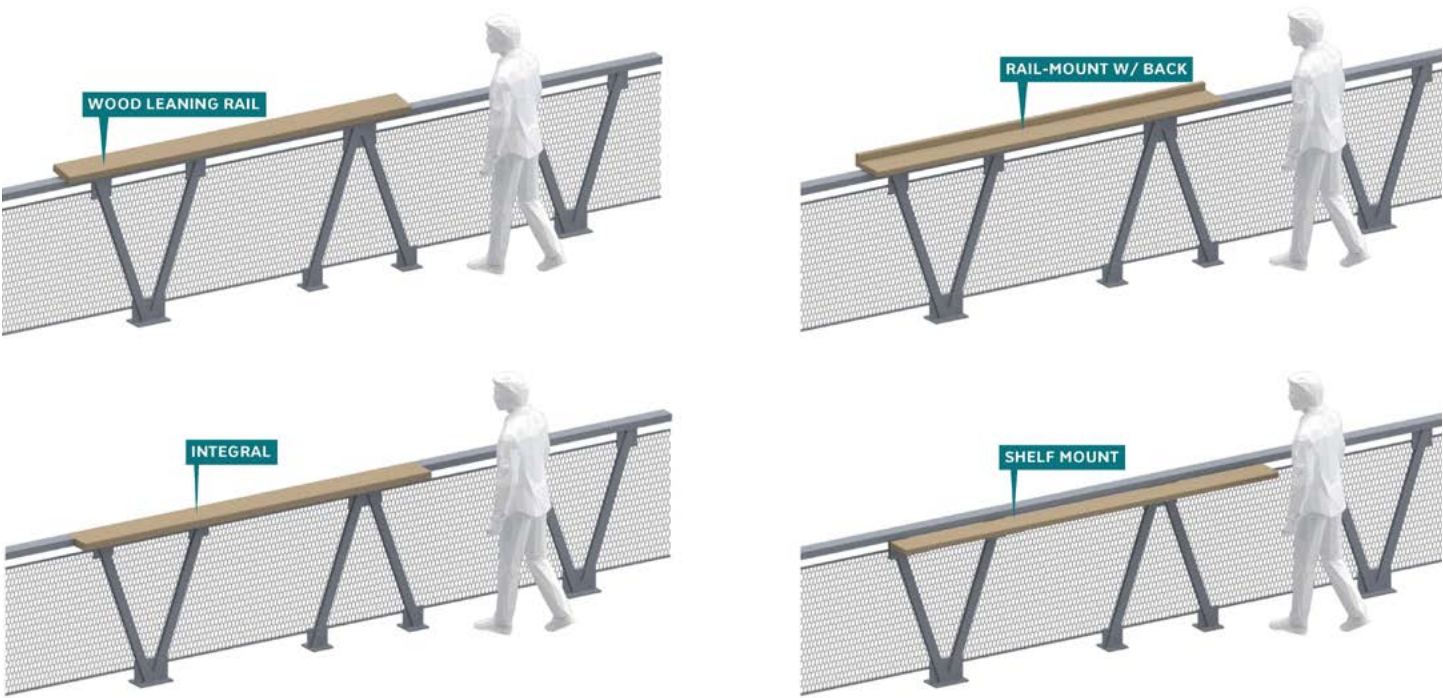


Rendered view of railing design

DETAILS



INTERCHANGEABLE TOP RAIL OPTIONS

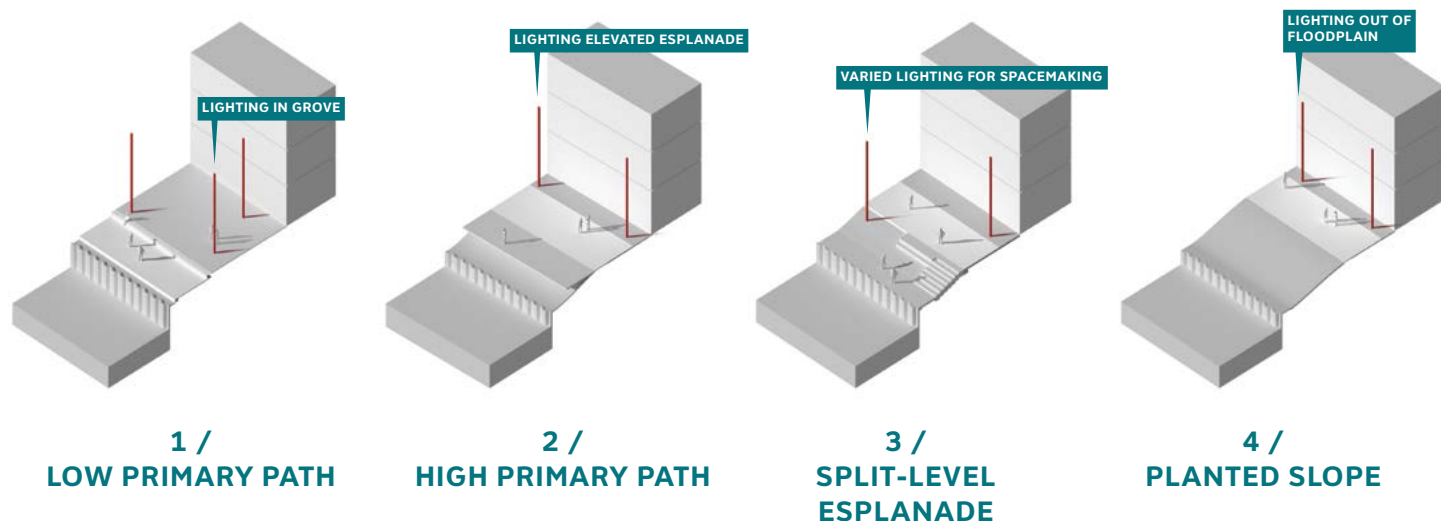


LIGHTING

CONCEPT



LOCATION



POLICY

The Waterfront Access Plan should adjust the lighting requirements to account for narrow 2-sided waterbody; to be more in line with DOT requirements; to acknowledge the desire for dark skies in the community; and to account for advances in lighting technology such as the transition to LED fixtures.

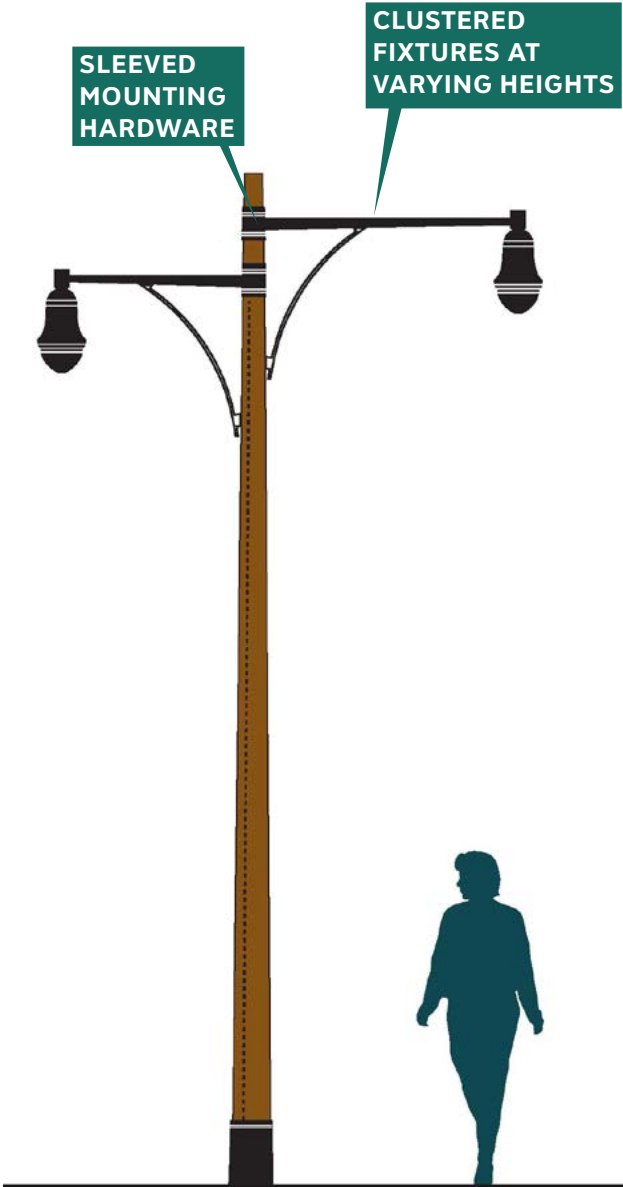
See more details in Gowanus Canal Conservancy Gowanus Waterfront Access Plan Recommendations.

LIGHTING STANDARD

LIGHTING DESIGN CONCEPT 1



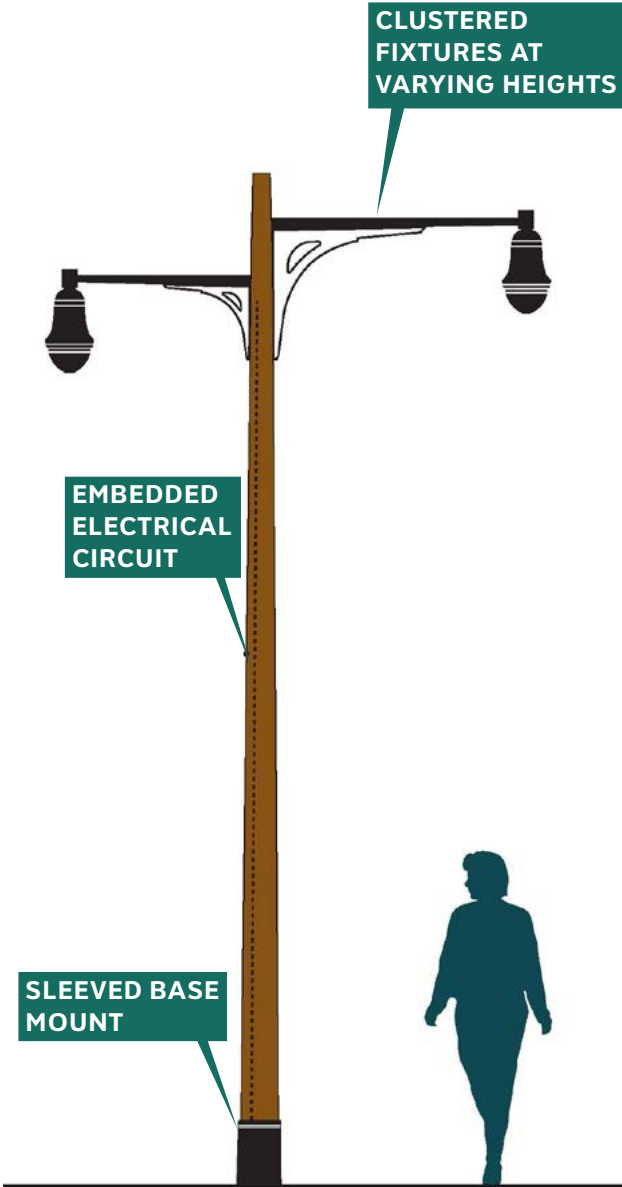
Shown with the Flatbush Ave Lamppost Bracket from the NYC Department of Transportation Street Design Manual



LIGHTING DESIGN CONCEPT 2

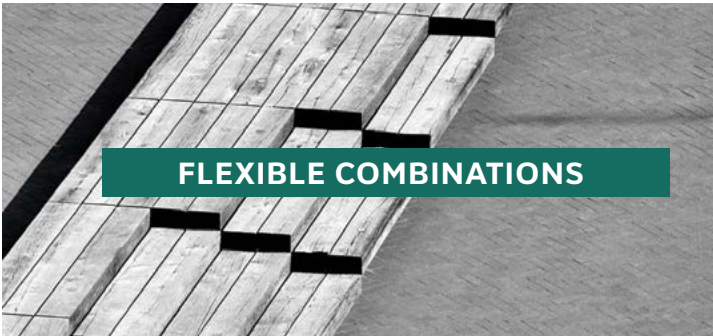


Shown with the TBTA Lamppost Bracket from the NYC Department of Transportation Street Design Manual

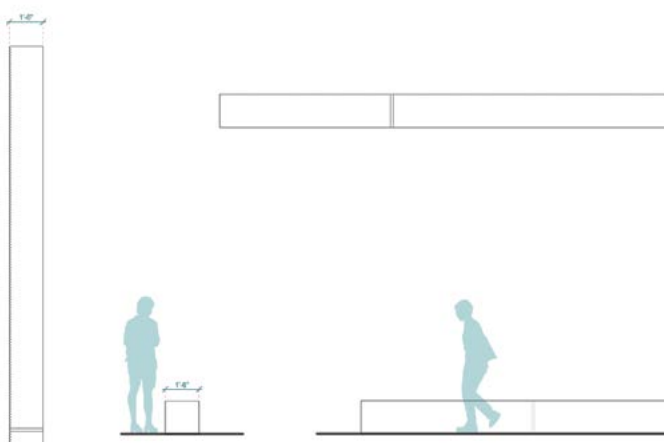
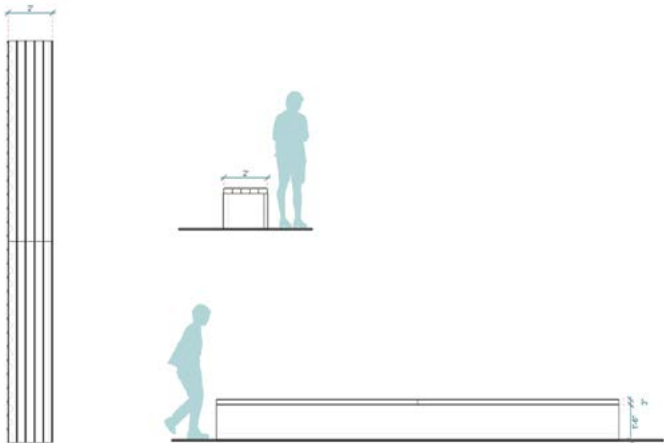
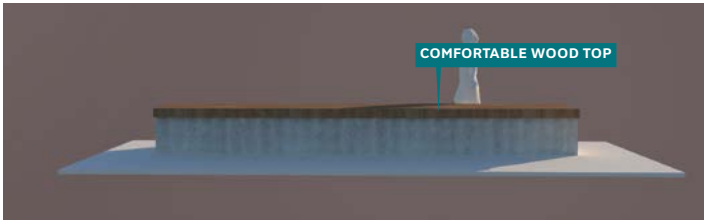


SEATING

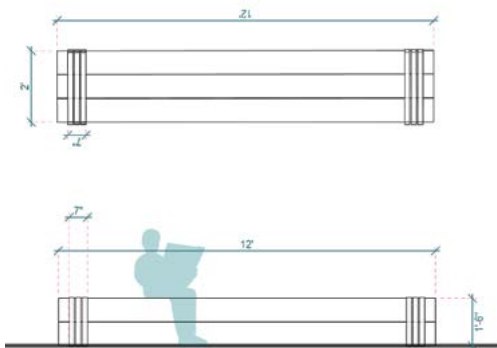
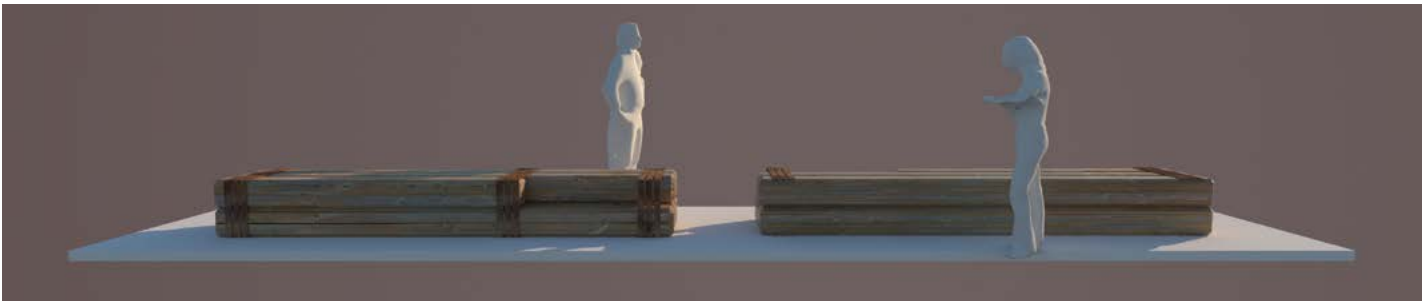
CONCEPT



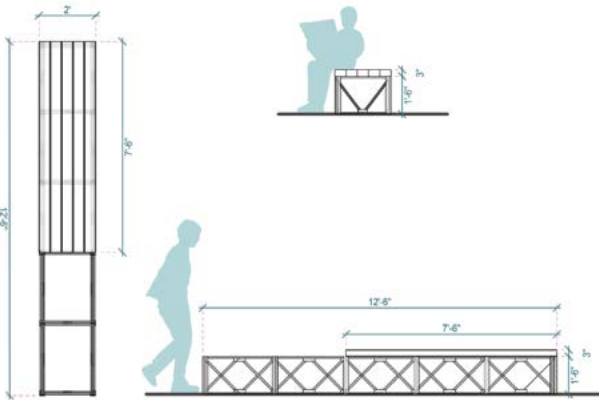
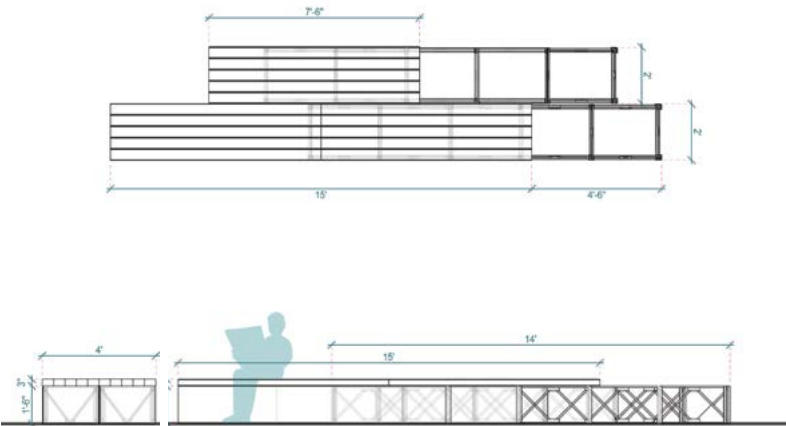
TEXTURED CONCRETE BENCH



BUNDLED WOOD BENCH



TRUSS & CONCRETE BENCH

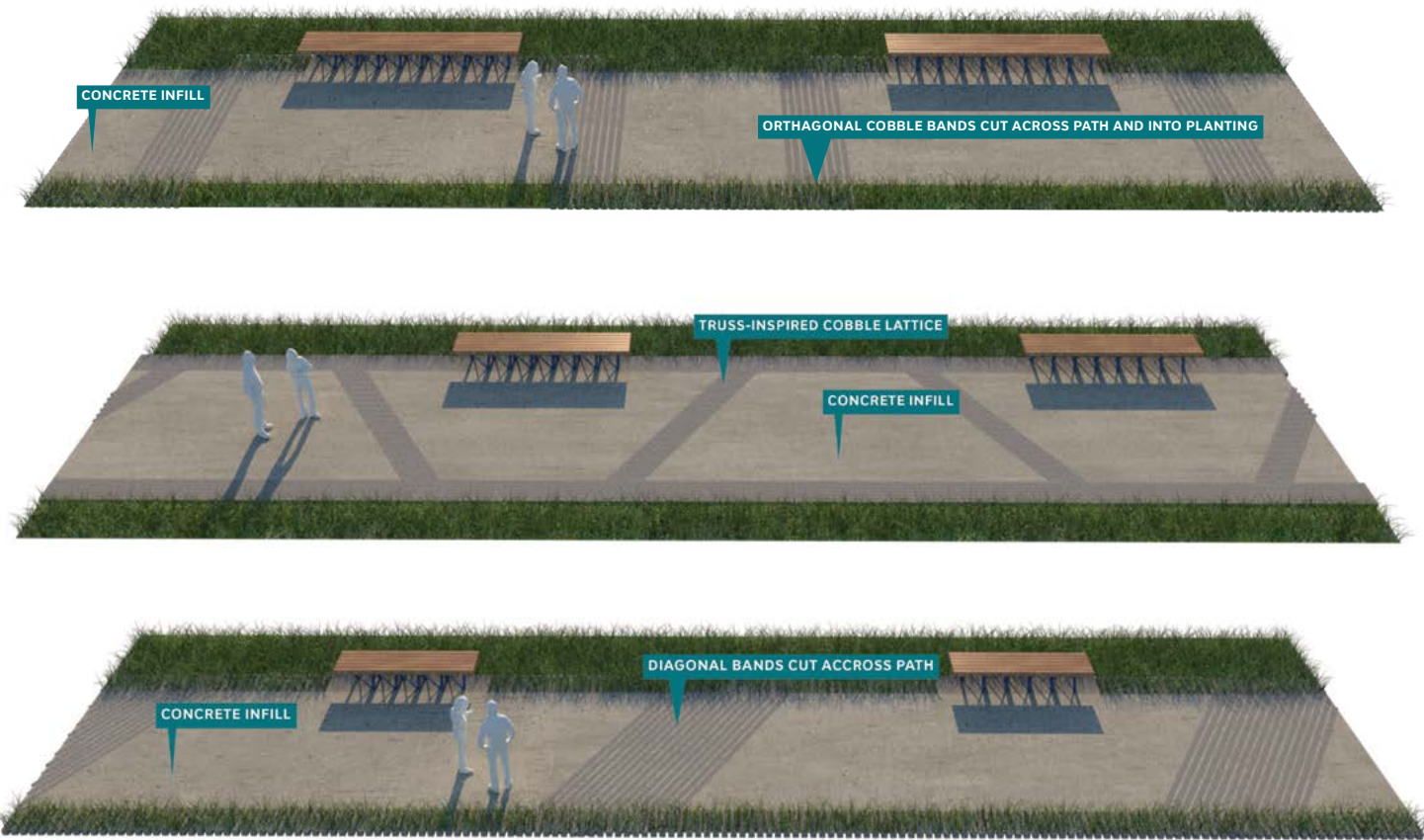


PAVING

CONCEPT



PAVING LAYOUTS



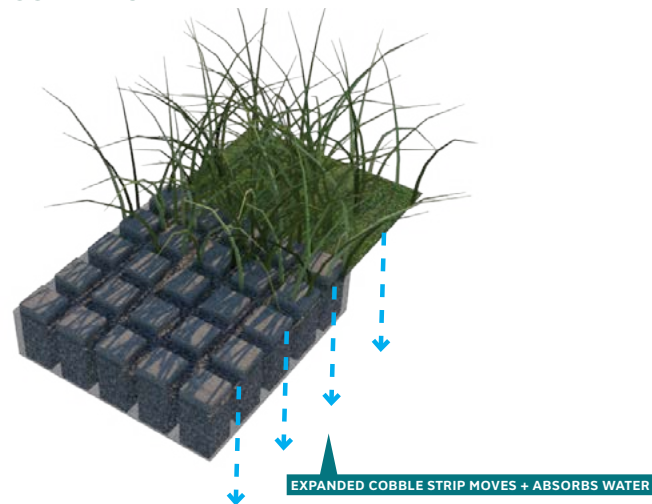
STRATEGIES FOR MOVING WATER

Where paved areas meet planting beds, a cobble strip made from reused Gowanus cobbles allows for increased stormwater retention and let plants bleed along the edges. Runnels set into cobble allow water to move across paved areas to specific drainage areas, while visualizing and interpreting this feature for the public.

COBBLE STRIP CONCEPT



COBBLE STRIP DETAIL

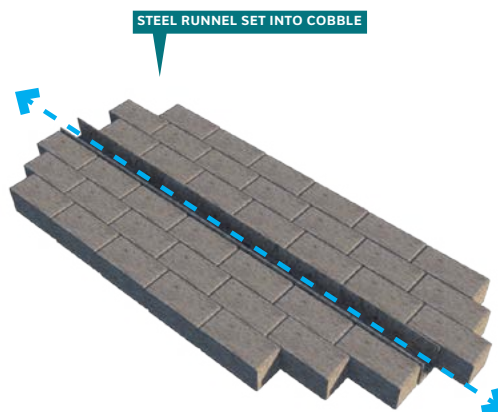


COBBLE STRIP PILOT PROJECT



GCC and SCAPE conduct a pilot project to test cobble strip configurations. Variables include cobble orientation, spacing, and joint filler medium. Source: SCAPE / Jackson Rollings

RUNNEL DETAIL



SHORELINE & BULKHEADS



The Salt Lot edge in Gowanus is a mix of urban materials and wild habitat. Bulkhead redesign should make room for shoreline ecology. Aerial photo source: Eymund Deigel, 2012

The shoreline is an ecologically rich intertidal zone that provides habitat for salt marsh plants, marine invertebrates, and shorebirds. In Gowanus, most of the shoreline is supported by bulkheads made of wood, concrete, steel, stone, or a mixture of crumbling urban materials. Most bulkheads along the canal will need to be reconstructed using steel sheet pile to support dredging as part of the Gowanus Canal Superfund clean-up.

ECOLOGY AT THE EDGE



Geukensia demissa, or Atlantic Ribbed Mussel populates a bulkhead constructed of wood cribbing, 2018

A CHANGING SHORELINE



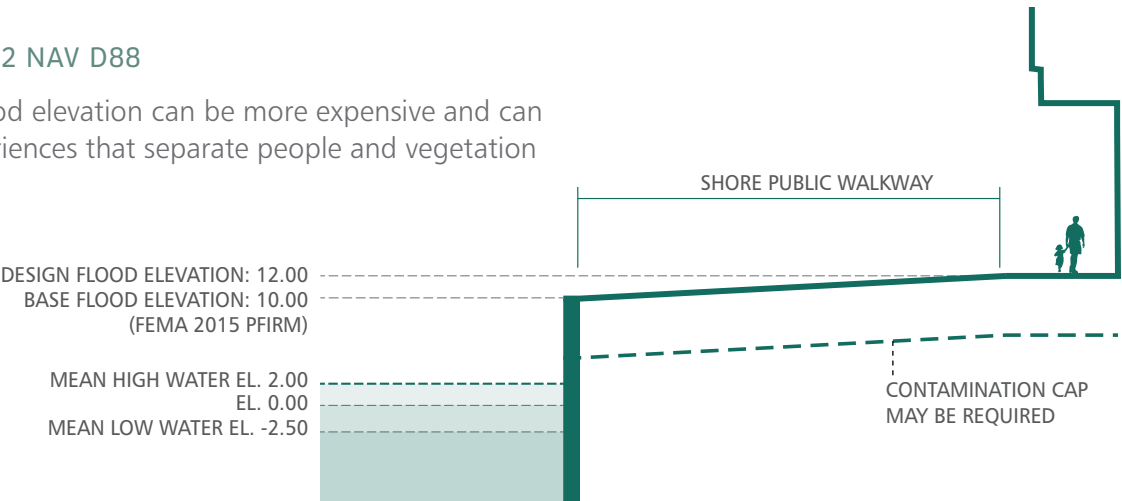
The Superfund clean-up will dramatically alter the shoreline by replacing most bulkheads with vertical steel sheet pile.

Bulkhead elevations impact overall canal aesthetics, water access, diversity of experience, the visibility of vegetation, and local drainage patterns, all critical factors to consider for the design of an immersive waterfront experience. Below is a matrix of bulkhead choices. Where possible along the waterfront, low and intertidal bulkheads are preferred to achieve ecological and programmatic goals.

HIGH BULKHEAD

ELEV. APPROX. +8 TO +12 NAV D88

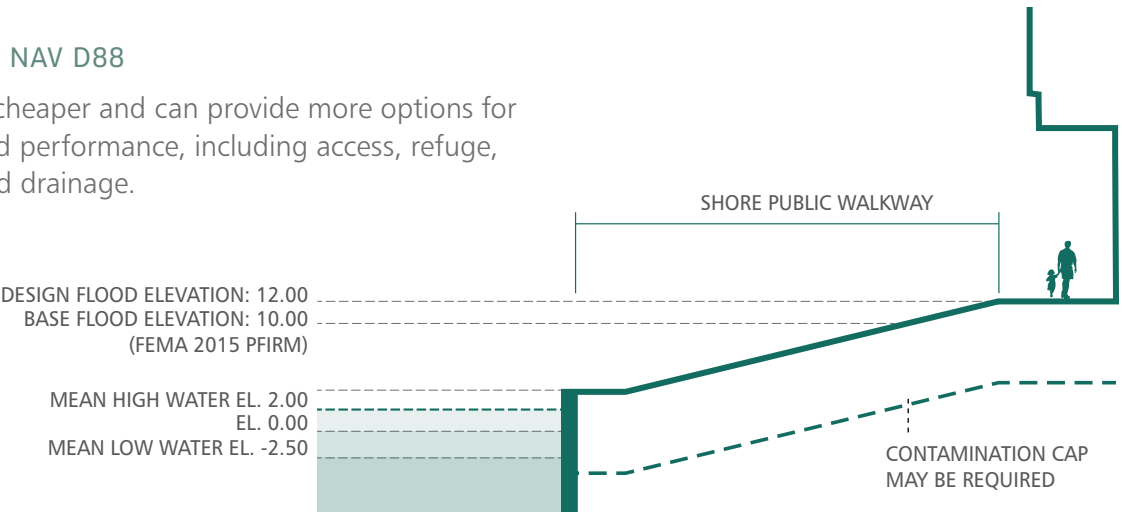
Bulkheads set at base flood elevation can be more expensive and can create monotonous experiences that separate people and vegetation from the water’s surface.



LOW BULKHEAD

ELEV. APPROX. +4 TO +7 NAV D88

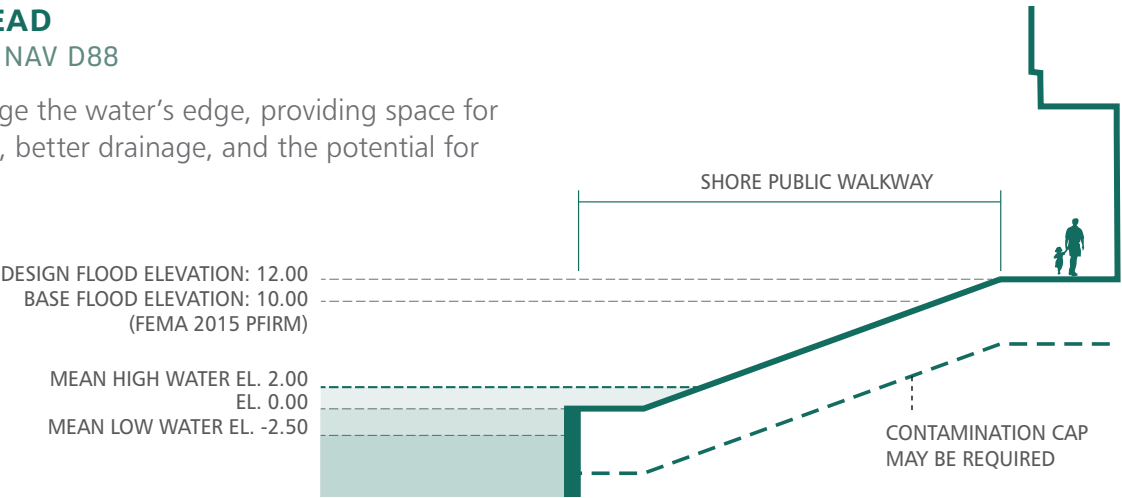
Lower bulkheads can be cheaper and can provide more options for waterfront experience and performance, including access, refuge, planted sloped banks, and drainage.



INTERTIDAL BULKHEAD

ELEV. APPROX. -2 TO +1 NAV D88

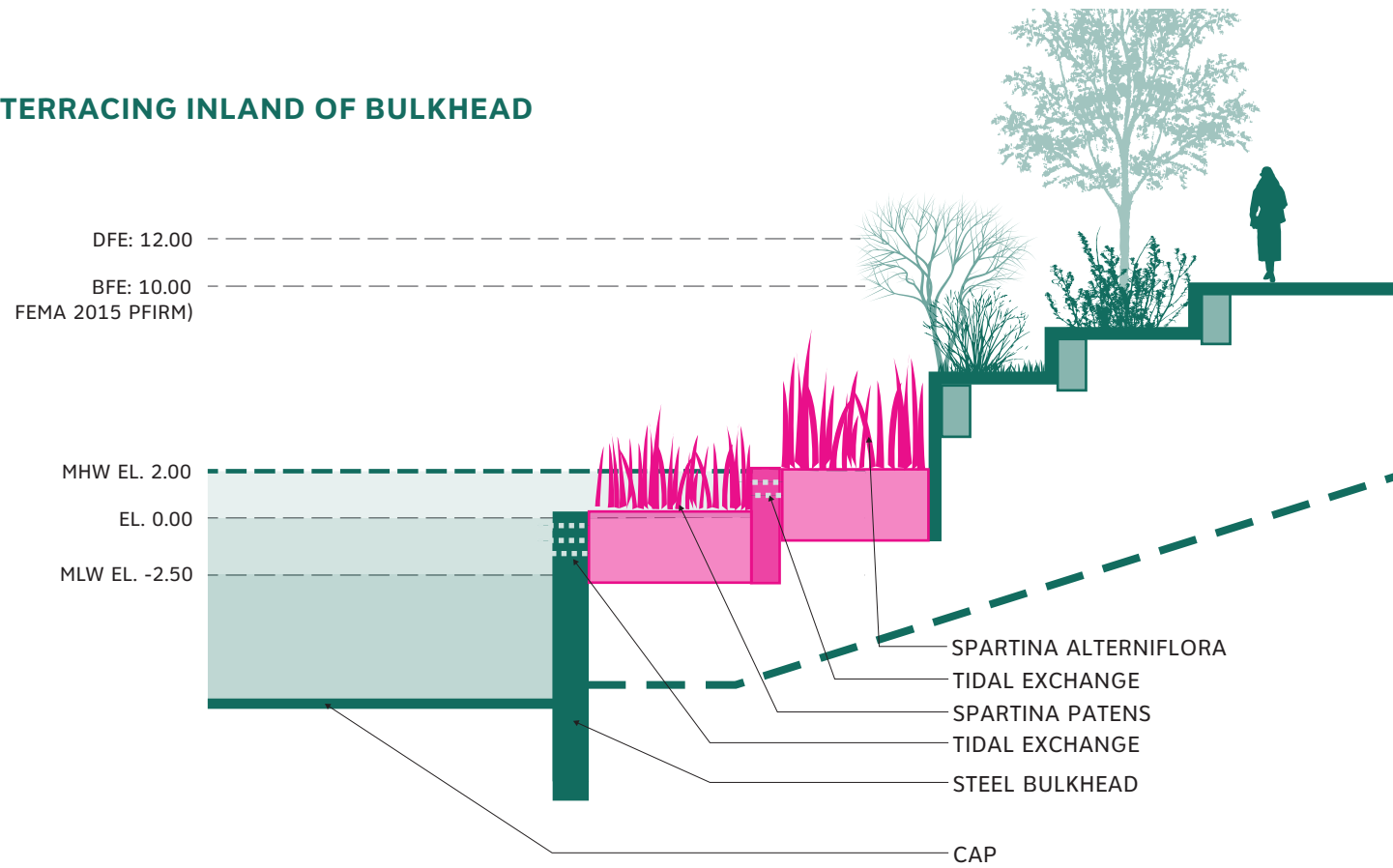
Intertidal bulkheads engage the water’s edge, providing space for direct access to the water, better drainage, and the potential for tidal ecologies.



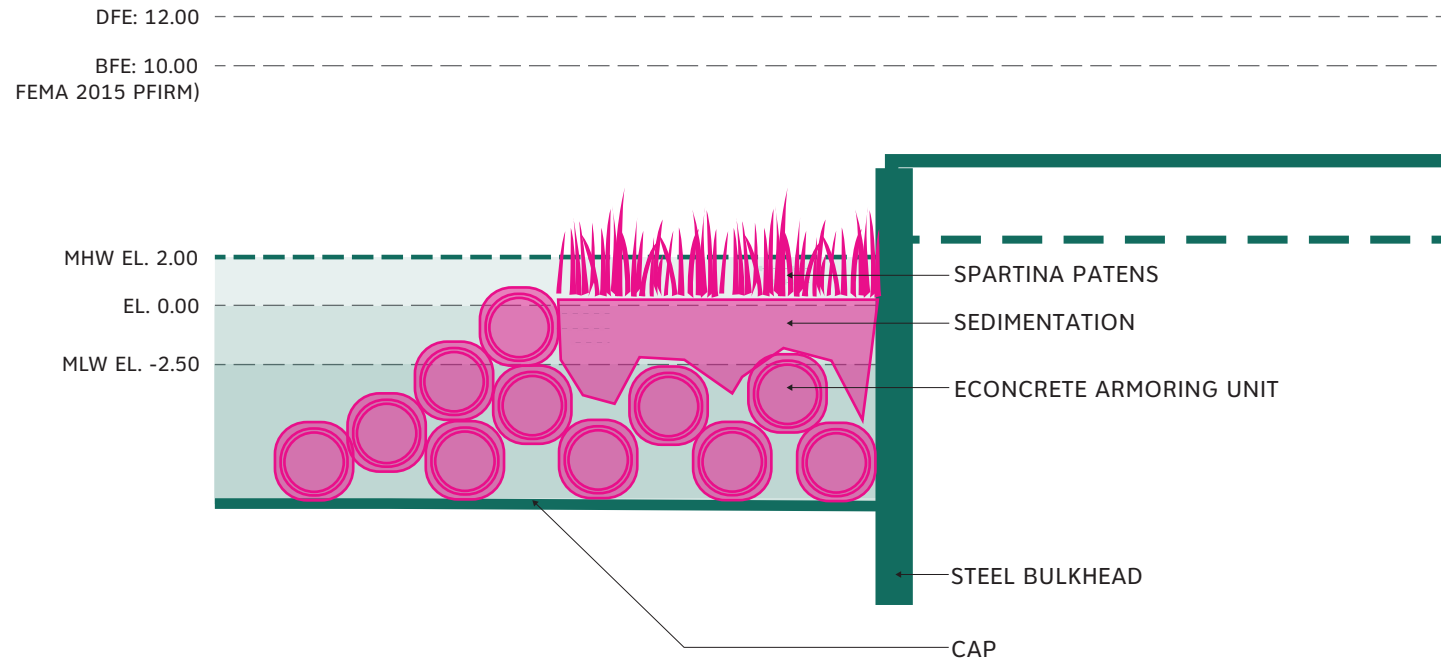
BULKHEAD HABITAT MODIFICATIONS

Steel bulkheads required under the Superfund will eliminate intertidal and aquatic habitat on the Gowanus Canal. The sections below present ideas for reconstructing the lost habitat.

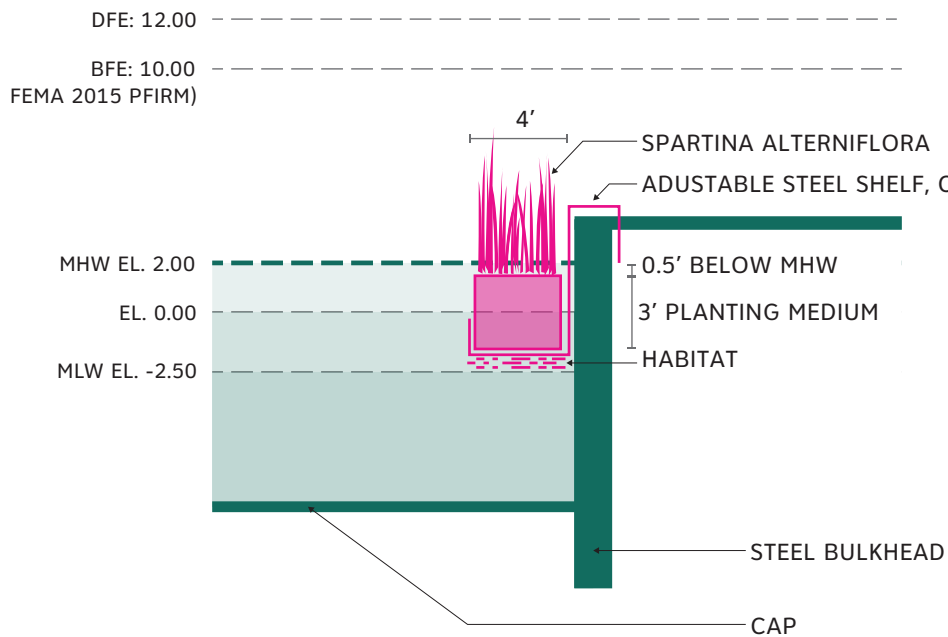
TERRACING INLAND OF BULKHEAD



SEDIMENTATION IN TURNING BASINS

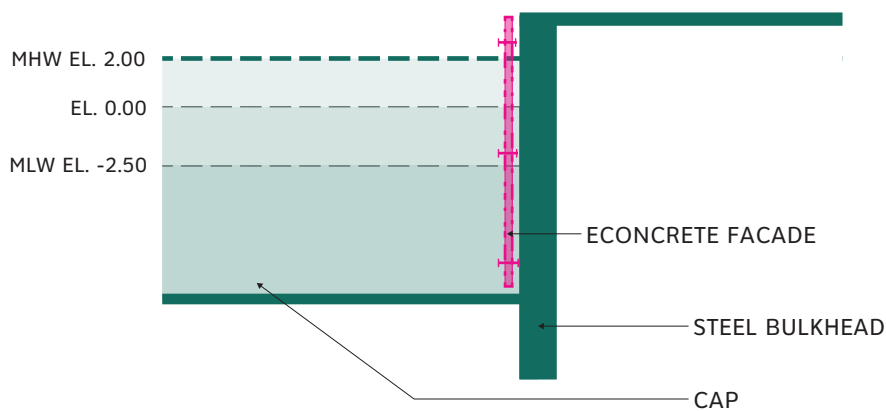


HANGING BASKET



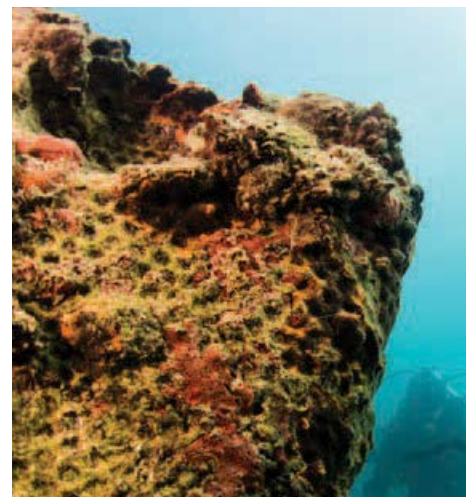
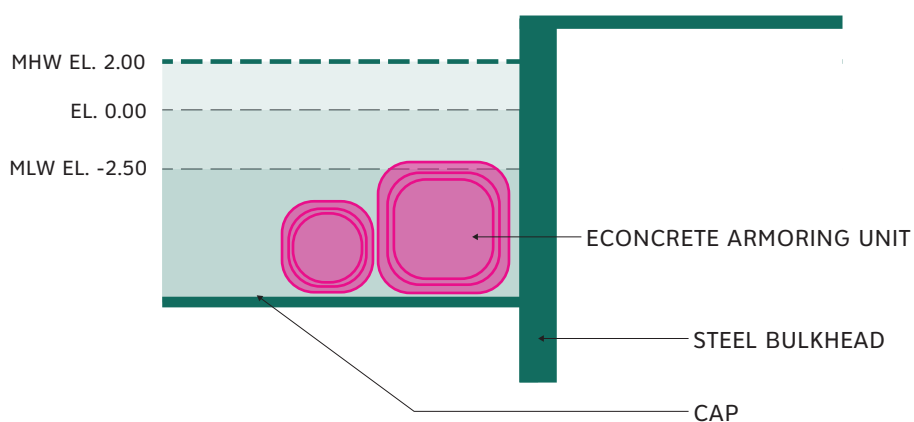
*Intertidal Wetlands - Newtown Creek
Newtown Creek Alliance*

FACADE



Econcrete Seawall Units- Herzliya Marina

ON TOP OF CAP



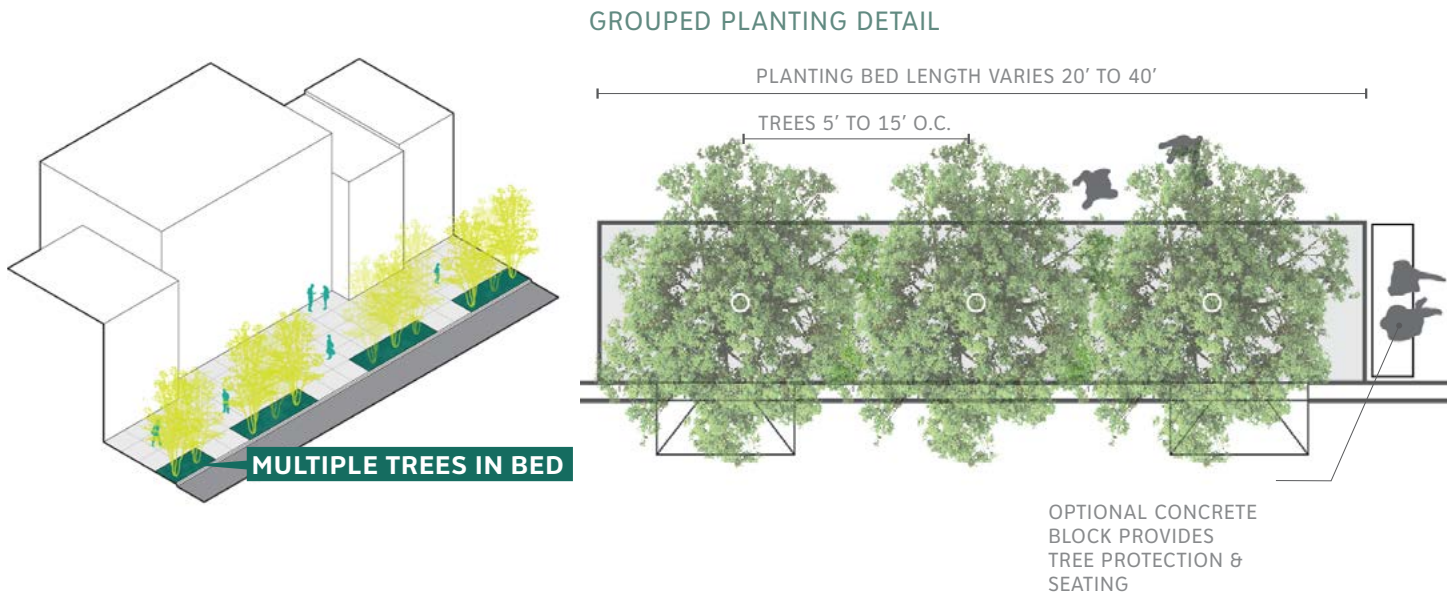
Econcrete Armoring Units - Polinom Port

STREETSCAPES & RAIN GARDENS

Given the unique context of and environmental issues in Gowanus, streetscape renovations and street tree plantings should utilize design details that maximize stormwater capture, increase shade cover, and use contextual materials.

GROUPED TREE PLANTING

Grouped tree plantings maximize shade and stormwater capture, and enhance tree health. They should be permitted in beds varying from 20' to 40' long and prioritized where loading zones and industrial activity prevent more regular plantings.



INDUSTRIAL STREETSCAPES



A granite block adjacent to rain gardens in the 6th Street Green Corridor provides seating and a buffer from industrial activity.

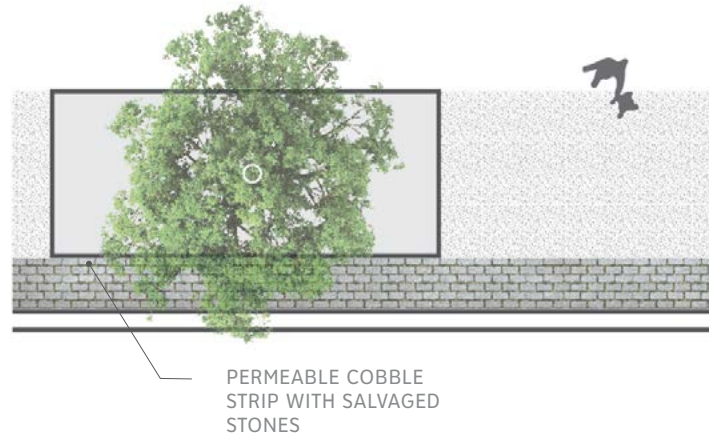
COBBLE STRIP AND PERMEABLE PAVING

Streetscape materials should include permeable paving and locally salvaged cobblestone where possible. On wide sidewalks and industrial areas, layout may include a curbside cobble strip that provides vehicular loading space and offset from trucks.



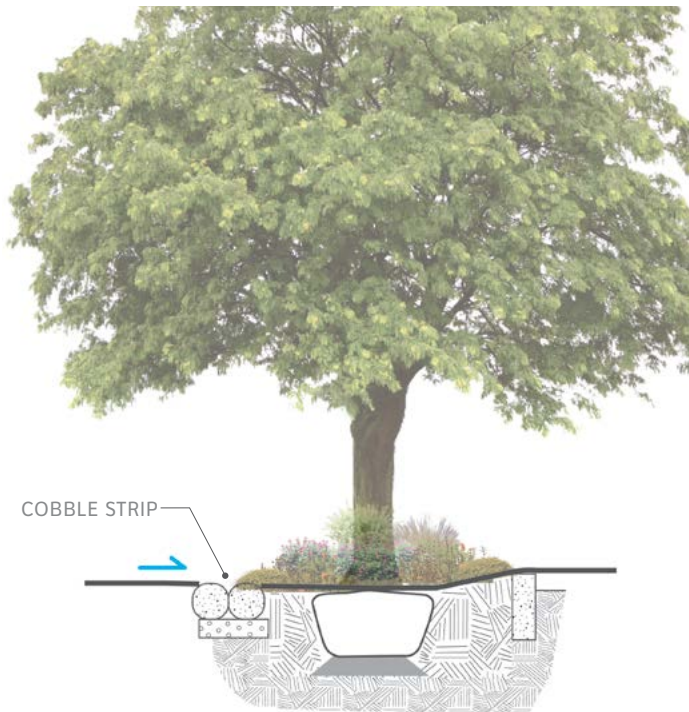
Historic Gowanus materials: cobble, stone slab and marine grade lumber.

COBBLE STRIP DETAIL



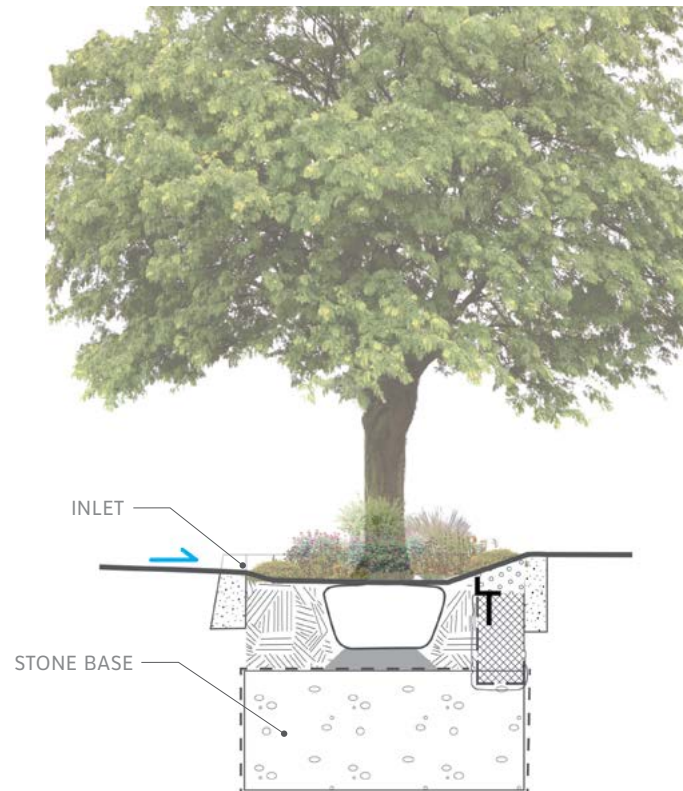
STORMWATER PERFORMANCE IN THE RIGHT-OF-WAY

ENHANCED TREE BED DETAIL



- Enhance tree bed with a flush permeable strip to increase water capture.

RIGHT-OF-WAY RAIN GARDEN DETAIL



- Enhance tree bed with inlet to increase water capture.
- Water is retained in stone base beneath tree bed.

STORMWATER STREET ENDS

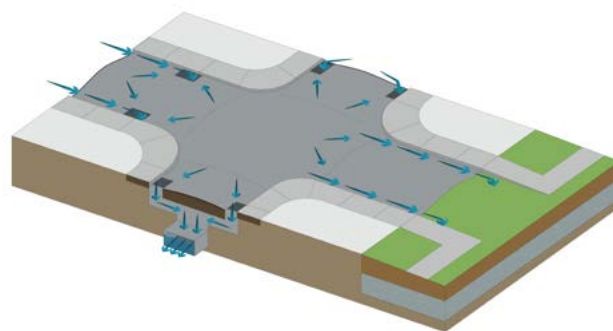
Stormwater street ends - small, street-end green infrastructure parks - can manage a much greater quantity of stormwater than right-of-way rain gardens. There are opportunities for stormwater street ends at the many streets that dead end into the canal.



2nd Street Sponge Park, Gowanus

GOWANUS SPONGE PARK

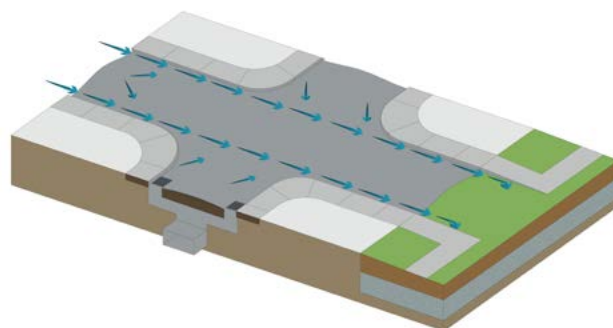
DEP, in partnership with dland studio, completed the first pilot Sponge Park at the end of 2nd Street in 2015. This installation has the capacity to handle 1 million gallons of runoff from several blocks. Unfortunately, current NYC practice for grading public streets diverts runoff to sewers at every intersection, so the installation is currently managing only 21,530 gallons of stormwater from one block.



Current grading funnels stormwater runoff into catch basin at every intersection, directly contributing to CSO.

POLICY RECOMMENDATION: LET STORMWATER CROSS THE STREET

To maximize the impact of street end green infrastructure, DEP and DOT must coordinate to allow stormwater to flow across street intersections.



Alternative grading could convey stormwater runoff through appropriate intersections towards Sponge Parks reducing CSO.

STREET END MANAGEMENT TO REDUCE CSO

SCENARIOS: CSO-SHED RH-035

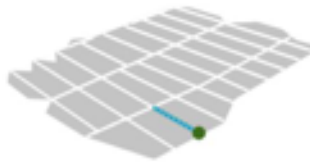
The RH-035 CSO-shed discharges 482,300 gallons of combined sewage and stormwater in a 1.2" rainstorm.



In the scenarios below, investing in 4 street end installations that manage water from several blocks are six times as effective as 7 installations that each manage stormwater from one block.

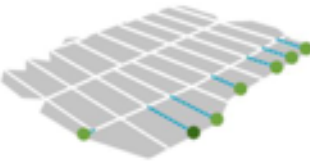
1 EXISTING SPONGE PARK STORMWATER DOES NOT CROSS STREET

MANAGES
21,530
GALLONS
IN 1.2" STORM



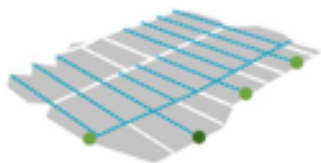
7 SPONGE PARKS STORMWATER DOES NOT CROSS STREET

MANAGES
106,125
GALLONS
IN 1.2" STORM

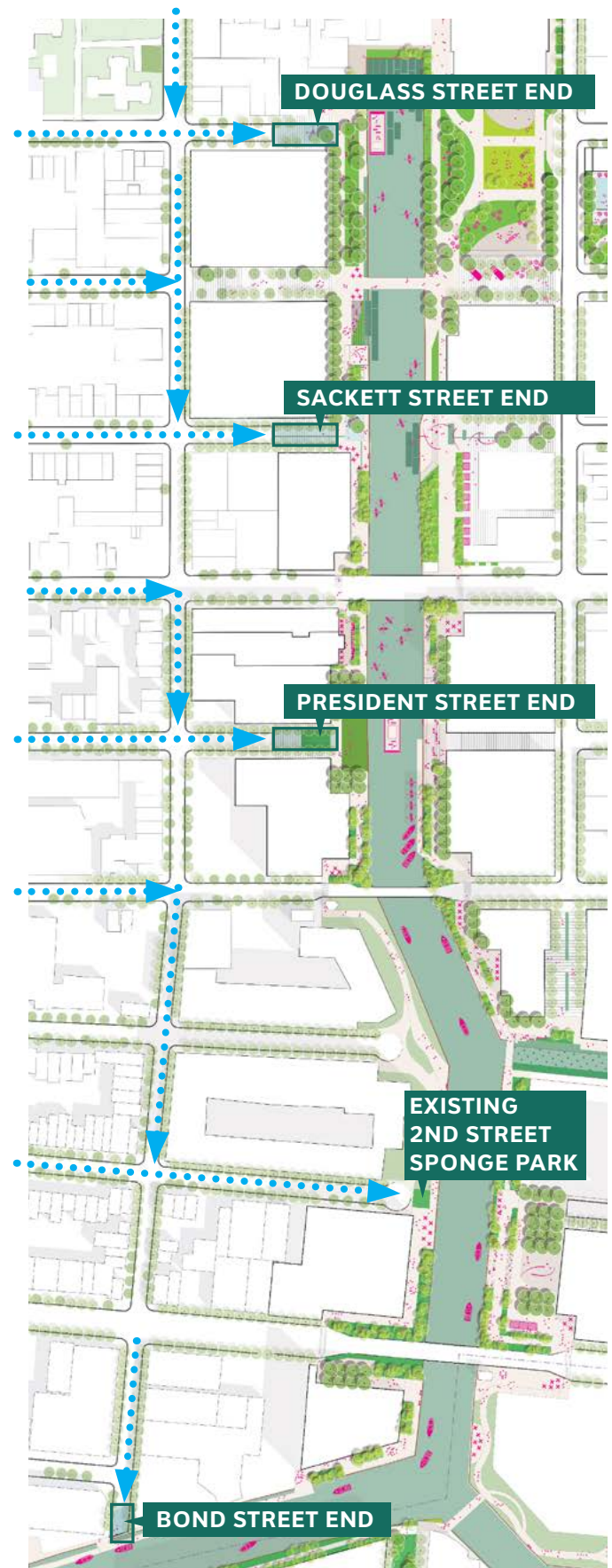


4 SPONGE PARKS STORMWATER CROSSES STREET

MANAGES
606,855
GALLONS
IN 1.2" STORM



Alternative grading could convey stormwater runoff through appropriate intersections towards Sponge Parks reducing CSO.



STORMWATER FLOW ●●→
PROPOSED STREET END
STORMWATER MANAGEMENT ■

SUSPENDED PAVING SYSTEMS

Suspended paving systems, or soil cells, were developed as underground bioretention for tight urban spaces where permeability may be limited. They have been successfully utilized to improve stormwater management and enhance streetscape design across NYC, including in the Hunter's Point Project (Long Island City) and the West 125th Street Streetscape Improvement (Harlem). The design and installation is modular and can be customized to support large tree growth and provide on-site stormwater management to meet specific project goals, and the cells can be wrapped in an impermeable fabric, thus acting as a temporary holding basin.



Hunter's Point, Long Island City. Source: Deeprout



Silva Cell installation. Source: Deeprout

INSTALLATION

A single suspended paving cell consists of a deck (fiberglass-reinforced, chemically-coupled, impact-modified polypropylene) base and 6 posts. A typical, singular streetscape installation with one tree planting might contain a minimum of 4 cells with 140 cubic feet of soil volume, and have a potential stormwater filtration capacity of 28 ft. The system design is modular and can be customized. Each installation is filled with a permeable media, typically soil, and wrapped in an impermeable fabric.

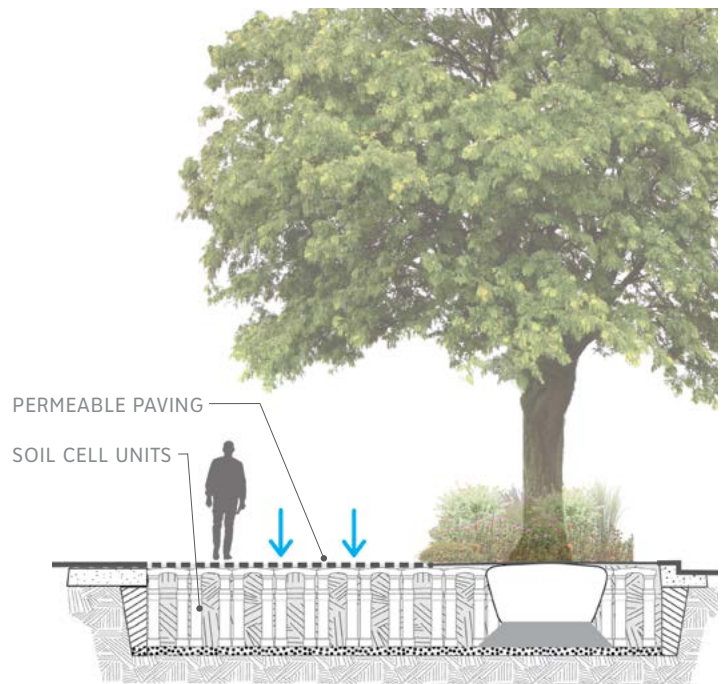
MANUFACTURERS

Deeprout (Silva Cells), CityGreen (Stratacell), GreenBlue (Rootspace)

BENEFITS:

- Water quality & pollutant control
- Peak overflow reduction
- Low maintenance
- Support large tree growth

SUSPENDED PAVING DETAIL



- To maximize water capture and drainage, install soil cell units below tree beds and adjacent sidewalks, bike lanes and road beds.

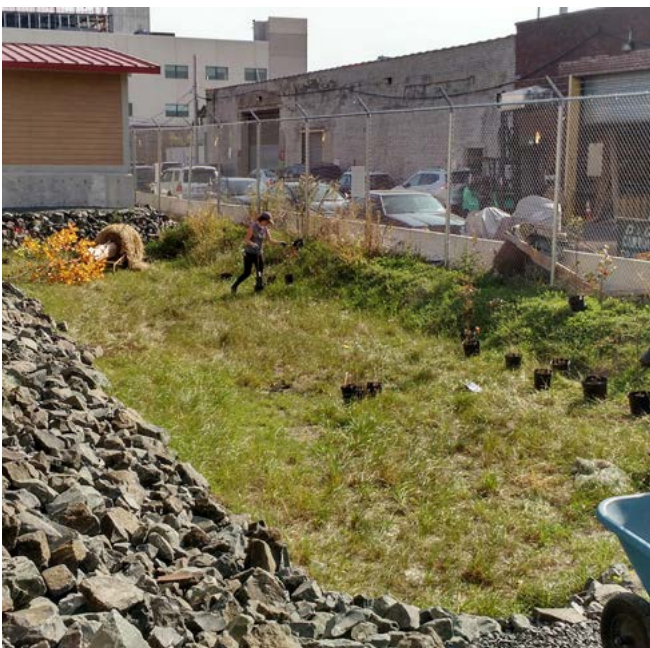
WET SWALES

In low-lying areas where the water table is high, wet swales can provide flood control and runoff filtering for improved water quality. Often acting as a wetland cell between a waterbody and emergent wetland, they intercept groundwater, accept stormwater runoff, and can support a permanent wetland plant community.



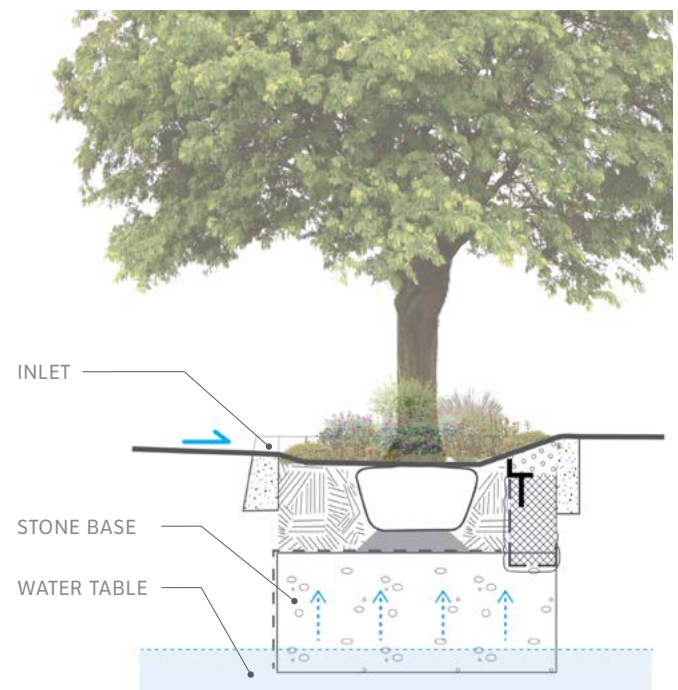
Stepped wet swale. Source: Virginia Association of Soil and Water Conservation Districts

PRECEDENT



Canal-adjacent sites with regular standing water, such as the Salt Lot wet swale pictured here, are ideal locations for wet swales.

WET SWALE DETAIL



- Site in areas with high ground water.
- Elimination of landscape fabric and selection of water-loving plants allows ground water to be taken up and recharged.

BOAT DOCKS

With calm waters and narrow dimensions, the Gowanus Canal provides an excellent location for human-powered boats, including canoes, kayaks, and rowboats.

The Gowanus Dredgers Canoe Club has provided programming along the canal for 20 years and currently operate the canal's only public boathouse and dock, situated at the dead end of 2nd Street on the west side of the canal. More boat launches, boathouses, and boat storage areas should be located along the canal on both private and publicly-owned esplanades.

New docks should be designed to meet recommended specifications for accessibility and user safety.

The specifications on the opposite page outline how to create safe and accessible boat launches. These are based on recommendations from the *New York Harbor Estuary Human-Powered Boat Launch Design Guidelines* and additional feedback from members of the Gowanus Dredgers Canoe Club.



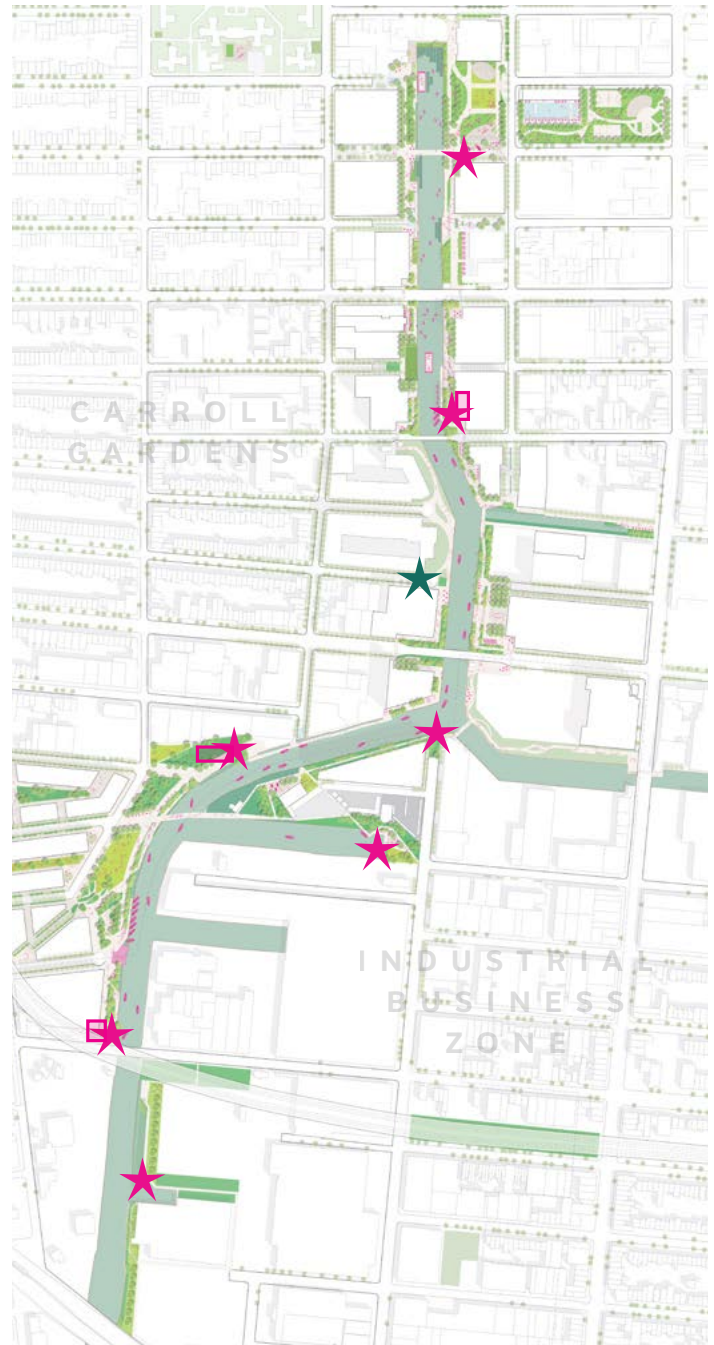
The existing 2nd Street boat dock adjacent to the Gowanus Dredgers boathouse is well-used but has design issues. The dock is suspended high above the water surface at low tide and the existing access route is too narrow.
Photo Credit: Owen Foote

POLICY RECOMMENDATION

In order to promote boat access, the Waterfront Access Plan should:

- Allow Boathouses as permitted obstructions in Shore Public Walkways and Visual Corridors
- Incorporate Amenity Square Feet Reduction or planting reduction to incentivize Boat Launch

See more details in *Gowanus Waterfront Access Plan Recommendations*.



- EXISTING DOCK ★
RECOMMENDED BOAT LAUNCH LOCATION ★
RECOMMENDED BOAT HOUSE OR STORAGE □

BOAT DOCK DESIGN SPECIFICATIONS

DIMENSIONS:

- DOCK FOR PUBLIC PROGRAMS: Minimum 24' x 60' to allow multiple boats to load, launch and disembark simultaneously and safely.
- SMALL DOCK FOR WATER TRAIL USERS: Minimum 8' x 20' feet to accommodate 2 boats side-by-side and the longest sea kayaks (up to 19+ feet).

DESIGN:

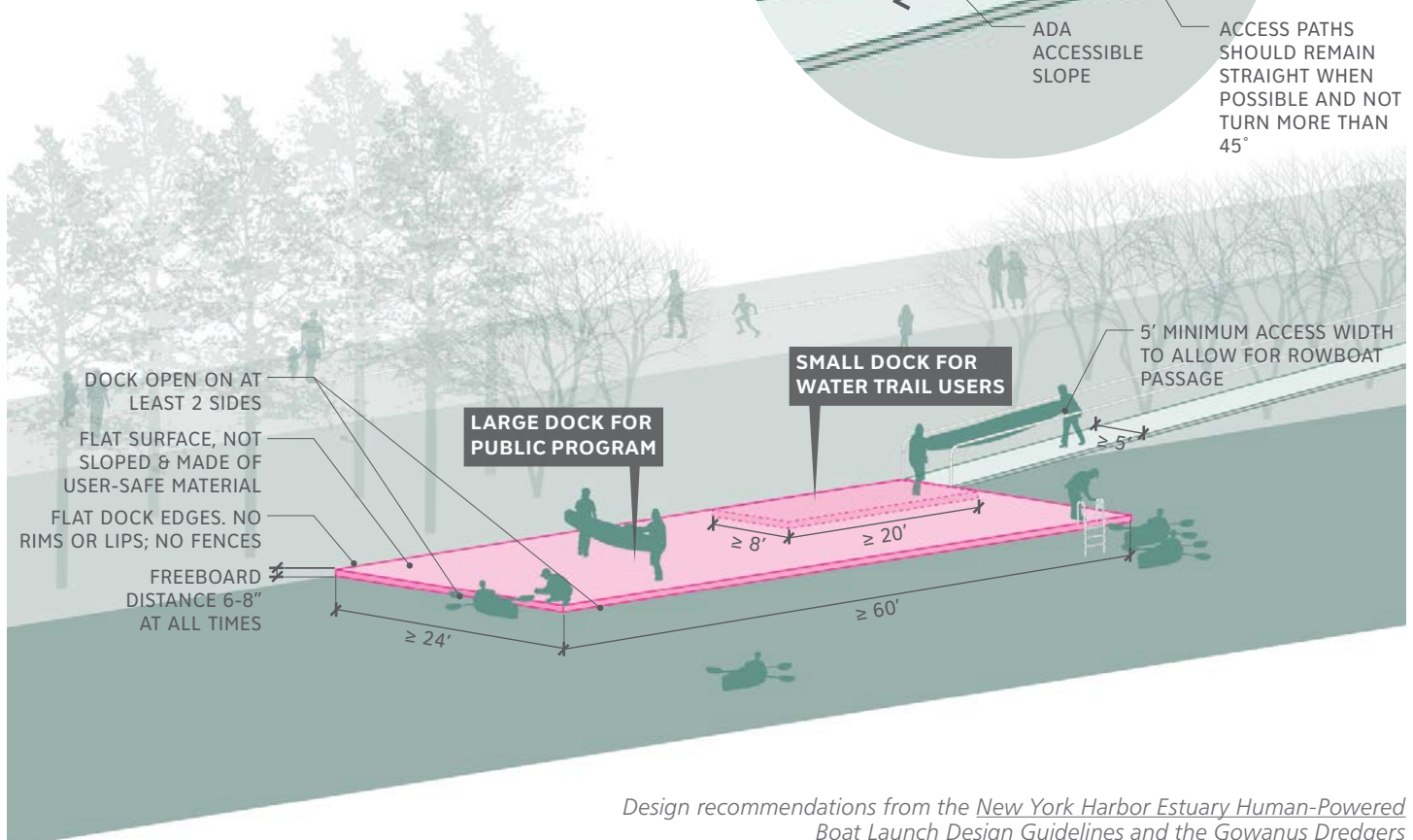
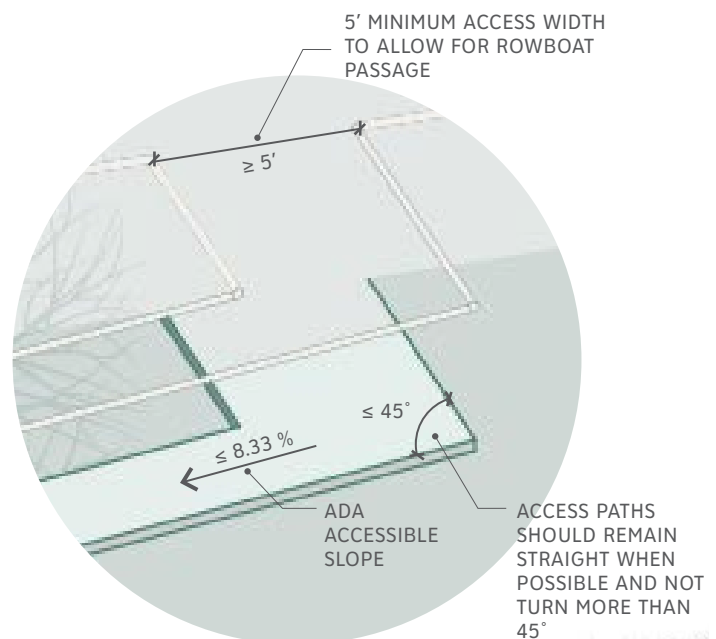
- Freeboard: 6-8" of freeboard above the water is ideal.
- Minimum of 2 unobstructed open sides.
- No fences.
- Rigid, NOT flexible or modular. The dock must not move suddenly or violently when a wave hits it or people walk on it.
- Flat, NOT SLOPED
- User-safe material. If wood, should not cause splinters. Metal or plastic should not be abrasive, get too hot, or even melt in extreme heat.
- Straight dock sides. No lips or rims to avoid crushing injuries.
- No sharp edges.

SITING:

- Site dock to be safe and usable at all times of the tide, have good sightlines, minimize riparian vegetation impact, and where the ramp will not enter onto a busy walk/bikeway.

ACCESS:

- No steps anywhere, especially on the dock itself.
- Access paths should remain straight when possible and not turn more than 45° with no sharp turns to negotiate.



Design recommendations from the [New York Harbor Estuary Human-Powered Boat Launch Design Guidelines](#) and the [Gowanus Dredgers](#)

PUBLIC ART

Public art installations in Gowanus should showcase local talent and/or interpret the history and culture of Gowanus. The work should ideally be conceived and produced in Gowanus by a local artist. For a non-local artist's work to be considered, it should interpret the history or conditions of Gowanus in some way. Investment in the arts should elevate the existing art and culture of Gowanus, not displace it.

PRECEDENT: INDUSTRIAL MATERIAL



Sculptures by Mark DiSuvero embrace the techniques and materials of industrial fabrication

PRECEDENT: CONTEXTUAL EXHIBIT



The Gowanus Undesign the Redline exhibit interprets the local history of redlining. It was temporarily installed in neighborhood locations in 2019.



PRECEDENT: LOCAL ARTIST MURAL



"Gowanus Industry & Ecology" Mural by Ruth Hofheimer and Julia Whitney-Barnes. Photo Credit: Vladimir Brezina

PRECEDENT: INFRASTRUCTURE ART

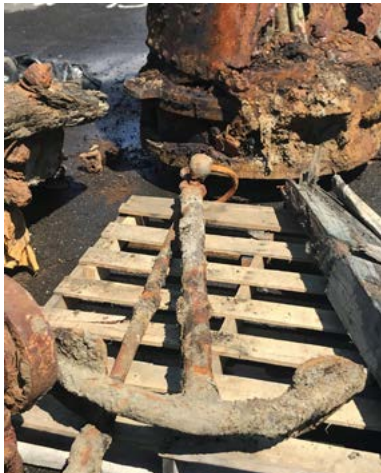


"Gorgon on the Gowanus" Christina Kelly's proposal for a sculpture of an ancient Roman Medusa head framing a combined sewage outfall.

ARTIFACTS

As the Gowanus Canal is dredged over the next decade, numerous artifacts that speak to the history of the neighborhood will be recovered. Below are some of the items found in the 4th Street Turning Basin Pilot Dredging in 2018. These items should be displayed in a Gowanus museum and incorporated into the landscape and interpreted for the public by artists and designers.

FISHERMAN'S ANCHOR



GANTRY PART



VARIOUS ITEMS



WOODEN DEBRIS



DREDGING BUCKET



ROLLER BEARING



WOODEN WHEELS



BRASS PORT HOLE



METAL WHEEL & AXLE



BRICK & METAL ITEMS



Images courtesy of the Environmental Protection Agency (EPA)

SIGNAGE & WAYFINDING

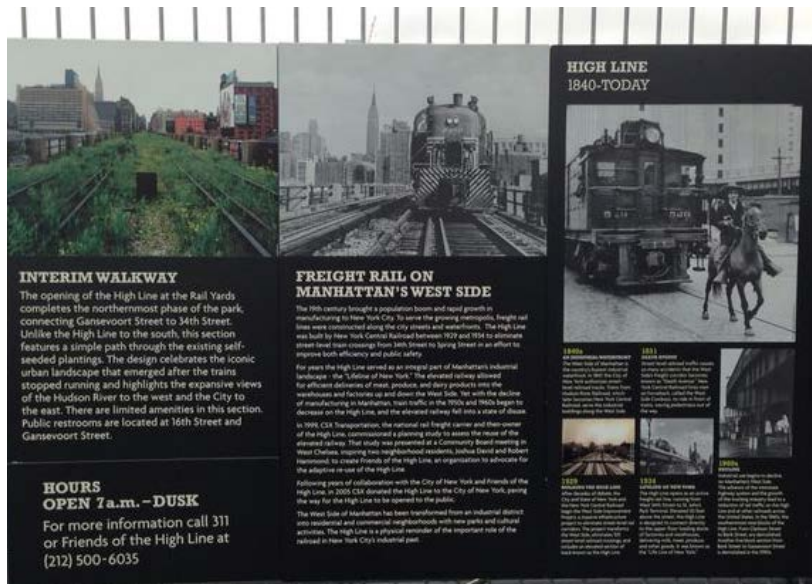
Signage and wayfinding in the Gowanus Lowlands should interpret the rich history, infrastructure, art, and ecology of the neighborhood while orienting park-goers and improving safety.

Historic buildings, artifacts, artwork, recreation sites, transportation, plant species, infrastructure, and stories of the diverse communities through history should be called out.

PRECEDENTS: SIGNAGE



A signage precedent from the Bloomberg San Francisco Tech Hub pairs modern design with existing material to interpret history



Signage on the High Line interprets infrastructure, history, and planned work

PRECEDENTS: WAYFINDING



Stream painting with Stacey Levy in 2017 was an event that visualized buried streams on sidewalks around the Gowanus Canal.



The Pottery Road Bicycle and Pedestrian Crossing in Toronto, CA includes interpretation embedded into the landscape to announce a river crossing and improve safety

