



BROOKLYN **WATERFRONT GREENWAY**

plan for stewardship & maintenance

Winter 2008



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Introduction

Brooklyn Greenway Initiative and Regional Plan Association are coordinating a comprehensive planning process for the Brooklyn Waterfront Greenway. One of the objectives of this effort is to frame an approach to maintenance and stewardship for the greenway that can be implemented as the greenway is built. This document is intended to define the broad parameters of this stewardship plan and to serve as the vehicle for achieving consensus among public agency and private stakeholders. It will be followed by a business plan for the operation and maintenance of the greenway.

Phase 1 of planning for the Brooklyn Waterfront Greenway resulted in the publication of the Brooklyn Waterfront Greenway in CB2 & CB6, a conceptual plan. Phase 2 will result in the addition of a conceptual plan for CB1, design guidelines, and the final version of this stewardship plan. Phase 3 will involve the completion and implementation of a business plan for the stewardship entity that identifies the sources and uses of maintenance and operations resources. During Phase 3, working with all stakeholders CB7 will be incorporated in one comprehensive stewardship program. Throughout the three planning phases, the planners have coordinated efforts for securing right of way agreements, funding, design and construction of the greenway working through a technical advisory committee comprised of all of the agency and institutional stakeholders.



Need for a Plan

Maintenance of the Brooklyn Waterfront Greenway will involve unique challenges largely because the greenway right of way is comprised of property of eight public agencies namely:

NYC Department of Transportation
NYC Department of Parks and Recreation
NYC Economic Development Corporation
Brooklyn Navy Yard Development Corporation
Brooklyn Bridge Park Development Corporation
Port Authority of New York and New Jersey
Federal Bureau of Prisons
NYS Office of Parks Recreation and Historic Preservation

In addition there is property coming from multiple private owners and leaseholders.

This situation poses significant coordination challenges. The challenges are heightened by the greenway not being a part of the core mission of some agencies and as such it may not receive priority attention and funding on an ongoing basis.

Believing that the greenway should only be built if we know how it will be managed and preserved, Brooklyn Greenway Initiative and Regional Plan Association (RPA) sought to develop a comprehensive stewardship and maintenance strategy for the greenway as a first-class facility that delivers user satisfaction and preserves the value of the public sector's capital investment in its construction. Brooklyn Greenway Initiative and RPA therefore made the development of a comprehensive stewardship strategy a principal task of their Phase 2 planning contract funded by the NYS Environmental Protection Fund.

This document is the first step toward negotiation and agreement on the responsibilities of all parties to the routine and long-term maintenance of the Brooklyn Waterfront Greenway.

The Greenway's Technical Advisory Committee discussed this issue at several of its meetings and came to the following conclusions:

1. Reliance on interagency coordination on maintenance has sometimes resulted in unsatisfactory outcomes.
2. Adding open ended maintenance commitments to agency operating budgets is difficult and agencies tend to resist such commitments for non-core assets.
3. Overall cost effectiveness is best achieved when agencies provide maintenance services that are part of their core competency, such as Department of Sanitation providing mechanical broom service, NYC parks providing tree maintenance and NYC DOT providing striping, signage, capital repairs and lighting. Former Deputy Mayor Stanley Leventhal established an interagency protocol for determining agency responsibility for maintenance where jurisdictions overlap sometimes referred to as the Leventhal Memorandum (Please see Exhibit 3).
4. Non-Profits play a key role in the operations and maintenance of a number of parks and greenways in NYC including Central Park, Hudson River Park, Prospect Park and Battery Park. With greenway right of way under the jurisdiction of eight public agencies and multiple private property owners, effective stewardship of the Brooklyn Waterfront Greenway calls for one entity to have greenway-wide perspective on its operations and maintenance. Brooklyn Greenway Initiative is prepared to assume the role of greenway conservator, coordinating the provision of services by the agencies and supplementing them with services funded privately.



Greenway Stewardship Section - North



Greenway Stewardship Section - South



Methodology

Given these findings, BGI/RPA and the Technical Advisory Committee have identified the maintenance services most appropriately provided by each City agency and major stakeholders such as the Brooklyn Navy Yard Development Corporation and the Port Authority and/or its leaseholders. Strategies for providing services not assumed by an agency or major stakeholder are also identified.

Maintenance Services

A comprehensive assessment of the maintenance services that will be required for the greenway was the next step. Through consultation within the Technical Advisory Committee and with consultants engaged in designing similar maintenance programs, particularly Signe Nielsen of Matthews Nielsen Landscape Architects, the following list of maintenance services has been developed:

Operating Maintenance

Hardscape Sweeping

Litter removal
Plowing
Repairs

- Landscaped areas
 - Litter removal
 - Weeding
 - Mulching
 - Watering
 - Seasonal planting and replacement

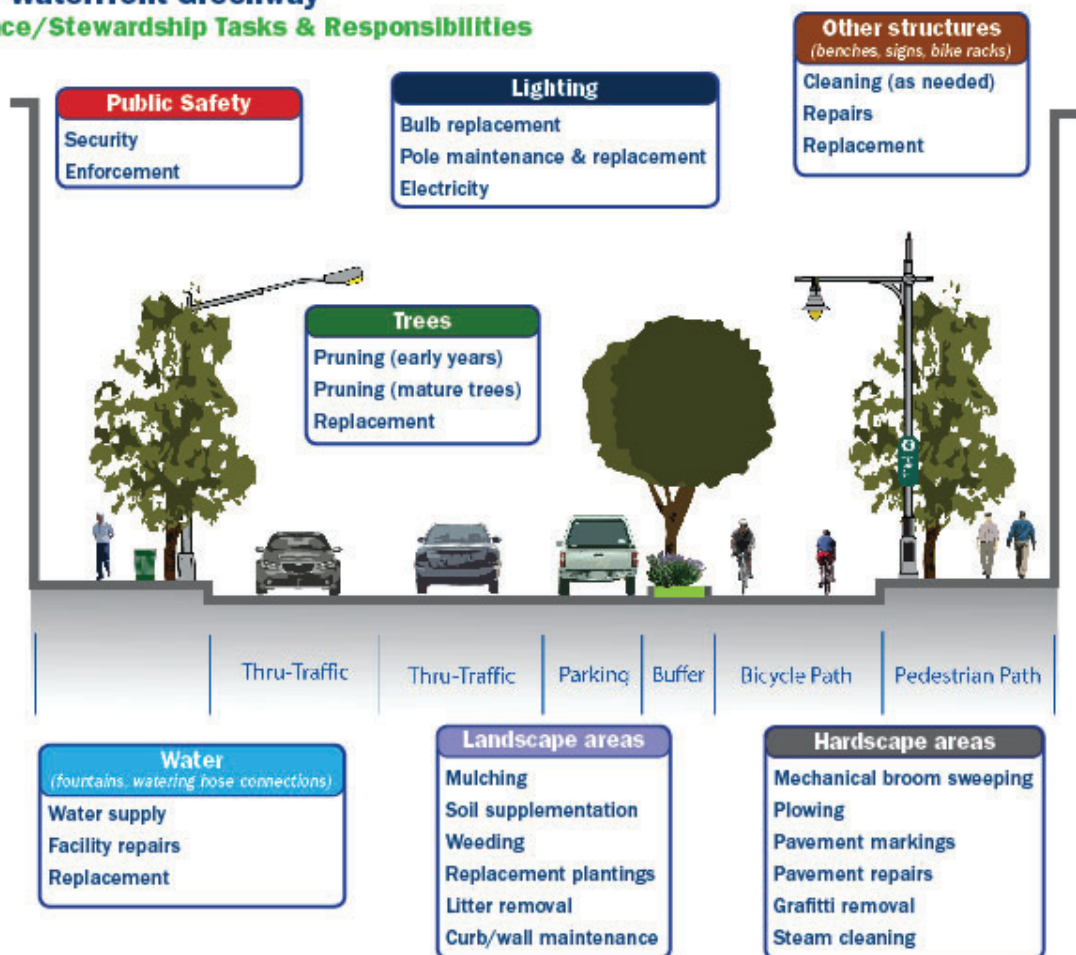
Utilities

- Lighting equipment maintenance
- Electricity
- Water equipment maintenance
- Water supply

Capital Maintenance
Replacement and major repairs

Brooklyn Waterfront Greenway

Maintenance/Stewardship Tasks & Responsibilities



Parties involved:



Methodology

Maintenance Demand

To determine the demand, or aggregate requirement for maintenance services, a comprehensive model of the physical features of the greenway was developed. The first step was to define what comprises the Brooklyn Waterfront Greenway. The second step was to drill down to the physical characteristics of each segment of the areas that comprehensively comprise the greenway. They included:

1. Pedestrian paths including paths through parks
2. Bike paths including paths through parks
3. Adjacent landscaped areas
4. Waterfront esplanades built on re-zoned waterfront properties

Each distinct segment of the greenway was defined. A total of 31 distinct segments were identified and estimates made of relative amount of hardscape and landscape areas for each segment. Typology characteristics are shown in the table below.

Typology	Width (ft)	Hardscape (ft)	Landscape (ft)	# of Segments
Class I	18	10	8	4
Class I	22	18	4	1
Class I	24	19	5	2
Class I	30	22	8	10
Class II	15	10	0	5
In Parks	30	22	8	3
Waterfront Esplanade	40	20	20	6
TOTAL # of Segments				31

Class I is a typology for bike lanes separated from traffic

Class II is a typology for striped bike lanes in roads



The table below shows the aggregate demand for maintenance services in terms of square feet of hardscape and landscape.

Responsibility	Total
Private	
Hardscape area (sq ft)	145,140
Landscape area (sq ft)	145,140
NYC Parks privately funded	
Hardscape area (sq ft)	234,180
Landscape area (sq ft)	234,180
Park	
Hardscape area (sq ft)	238,986
Landscape area (sq ft)	86,904
Mixed ownership (BGI coordination)	
Hardscape area (sq ft)	520,022
Landscape area (sq ft)	262,526
NYC DOT	
Hardscape area (sq ft)	169,760
Landscape area (sq ft)	-
Total	
Hardscape area (sq ft)	1,308,088
Landscape area (sq ft)	728,750

Private areas include sites such as Ikea, where the company has designed its Erie Basin waterfront open space as a greenway connector.

NYC Parks privately funded sites include the esplanades and open spaces included in the Greenpoint Williamsburg waterfront rezoning, where private common charges to residents will be the source of maintenance funding. These are areas that would be administered by the Parks Department's North Brooklyn Administrator and the Open Space Alliance.

Park areas include areas that fall within established parks. In parks the greenway was defined as the pedestrian and bike greenway paths and 20 feet on each side of them.

Mixed ownership areas include the Brooklyn Navy Yard and Piers 7-12, where the greenway right of way will include property and leasehold interests of NYC DOT as well as the Navy Yard, Navy Yard tenants, the Federal Bureau of Prisons, the Port Authority and American Stevedoring. These are areas where **Brooklyn Greenway Initiative coordination** will be especially important.

NYC DOT areas include locations where the greenway is totally within NYC DOT property, most notably a possible greenway connector through DUMBO and in Red Hook between Valentino Park and Erie Basin and between Red Hook Park and Third Avenue.

Methodology

Cost Estimates

Unit maintenance cost estimates were derived by analyzing actual and estimated costs for comparables in service or designed. The following tables illustrate comparables considered.

Hardscape/Landscape Maintenance	Area SF	COST				COST PER SF			
		Hardscape	Landscape	Lighting	Water	Hardscape	Landscape	Lighting	Water
Hunts Point Avenue Corridor	255,388	\$ 147,893.00	\$ 15,898.00	\$ 23,007.00	\$ 6,902.00	\$ 0.58	\$ 0.06	\$ 0.09	\$ 0.027
Lafayette Avenue Paseo	88,251	\$ 43,934.00	\$ 12,230.00	\$ 14,924.00	\$ 3,248.00	\$ 0.50	\$ 0.14	\$ 0.17	\$ 0.037
Food Center Drive	205,313	\$ 82,235.00	\$ 8,564.00	\$ 19,277.00	\$ 3,008.00	\$ 0.40	\$ 0.04	\$ 0.09	\$ 0.015
138th Street	67,334	\$ 7,435.00	\$ 3,065.00	\$ 6,374.00	\$ 763.00	\$ 0.11	\$ 0.05	\$ 0.09	\$ 0.011
						\$ 0.40	\$ 0.07	\$ 0.11	\$ 0.022

Hardscape Maintenance	Area SF	COST				COST PER SF			
		Hardscape	Landscape	Lighting	Water	Hardscape	Landscape	Lighting	Water
Manida Street	10,850	\$ 1,702.00	\$ -	\$ 1,244.00	\$ 54.00	\$ 0.16	\$ -	\$ 0.11	\$ 0.005
Viele Avenue	12,168	\$ 1,922.00	\$ -	\$ 1,244.00	\$ 62.00	\$ 0.16	\$ -	\$ 0.10	\$ 0.005
Willow Avenue	25,033	\$ 3,965.00	\$ -	\$ 3,109.00	\$ 124.00	\$ 0.16	\$ -	\$ 0.12	\$ 0.005
132nd Street	22,785	\$ 3,545.00	\$ -	\$ 2,798.00	\$ 116.00	\$ 0.16	\$ -	\$ 0.12	\$ 0.005
Bruckner Boulevard	143,050	\$ 28,559.00	\$ -	\$ -	\$ 290.00	\$ 0.20	\$ -	\$ -	\$ 0.002
						\$ 0.17	\$ -	\$ 0.12	\$ 0.004

For the Brooklyn Waterfront Greenway the following cost estimates are used:

Greenway Maintenance	Estimated Costs (per sq ft)
Hardscape areas	\$ 0.40
Planted areas	\$ 0.07
Maintenance Contingency (10%)	10%
Annual Site Maintenance Cost	\$ 0.52
Park lighting	\$ 0.11
Park water	\$ 0.02
Utility Contingency (10%)	10%
Annual Utility Expense	\$ 0.15
Annual Capital Maintenance	5%

The estimates of Direct Maintenance Costs for the broadly-defined Brooklyn Waterfront Greenway were derived by applying the above unit costs to the aggregate demand for maintenance (square footage).

Annual Site Maintenance Costs

Hardscape and landscaped areas are estimated to cost \$.40 and \$.07 per square foot respectively, resulting in a site maintenance cost of \$.52 per square foot including contingency of 10%.

Annual Utility Costs

Lighting and water costs are estimated at \$.11 and \$.02 per square foot, respectively, resulting in total utility costs of \$.15 including a 10% contingency.

Annual Capital Maintenance costs are estimated at 5% of total capital investment annually.

Total direct maintenance costs have been derived based on a 79,720 linear ft length of the Greenway in CB1, CB2 & CB6. The total area is estimated at 2,097,120 million square feet. Hardscape, primarily paths are estimated to comprise 64% of the area and landscape to comprise the remaining 36%.

Total construction costs have been estimated at \$45,295,310 using an estimated cost of \$568/linear foot or \$3 million per mile. More precise estimating will occur during the master planning of the greenway that is now being initiated by NYC DOT.

The resulting total estimate of maintaining the Brooklyn Waterfront Greenway, as it is most broadly defined, in Community Boards 1, 2 & 6 is \$1.6 million.

Direct Maintenance Costs	Total
Linear Feet	79,720
Section Area	2,097,120
Hardscape %	64%
Landscape %	36%
Hardscape Area	1,341,578
Landscape Area	755,542
Hardscape Cost @ \$0.55	\$ 737,868
Landscape Cost @ \$0.42	\$ 317,328
Maintenance Cost	\$ 1,055,196
Maintenance Contingency @ 10%	\$ 105,520
Annual Landscape Maintenance Cost	\$ 1,160,715
Park Lighting @ \$0.11	\$ 230,683
Utility Cost	\$ 230,683
Utility Contingency @ 10%	\$ 23,068
Annual Utility Expense	\$ 253,752
Construction Cost Estimate (\$568/linear ft)	\$ 45,295,310
Annual Capital Maintenance @ 0.5%	\$ 226,477
Total Direct Maintenance Costs	\$ 1,640,943

Provision of Maintenance

Class I Off-Street Segments



These include segments that lie totally outside of the vehicular road bed such as the Navy Yard and Piers 7-12. These segments are mostly comprised of property from two or more agencies - NYC DOT and the Brooklyn Navy Yard Development Corporation or NYC DOT and the Port Authority or NYC EDC. On these segments, NYC DOT should assume responsibility for capital replacement of hardscape areas. Maintenance of landscape areas would be the responsibility of NYC Parks & Recreation per to the Leventhal Memorandum. BGI would assist Parks, DOT, and other property owners with litter removal and basic horticultural services.

Because the paths on these segments are typically comprised of asphalt on a base of aggregate (versus a 10 inch concrete base for roads), NYC Department of Sanitation (DSNY) plows and mechanical brooms may be too heavy and damage the paths. Lighter, more maneuverable equipment should be considered for routine hardscape maintenance. This is a strong argument for acquisition of dedicated greenway mechanical broom equipment and possibly plowing equipment (Please see Mechanical Broom and Plowing below.) that can also be used to maintain paths on privately owned segments, in parks and on esplanades for a fee or exchange of services.

Operating Maintenance

Hardscape

- Sweeping – Greenway mechanical broom operator
- Litter removal - Property owners, BGI
- Plowing - Property owners, BGI
- Repairs - DOT

Landscaped areas

- Litter removal - BGI, Parks, Property owners,
- Weeding – Parks, BGI, Property owners
- Mulching - Parks, BGI, Property owners
- Watering - Parks, BGI, Property owners
- Seasonal planting and replacement - Parks, BGI, Property owners

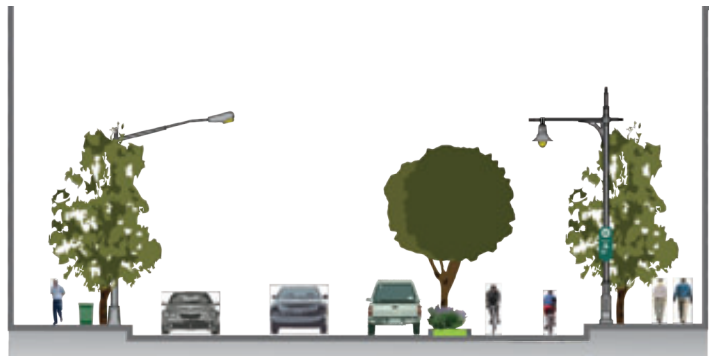
Utilities

- Lighting equipment maintenance - DOT
- Electricity - DOT
- Water equipment maintenance
- Water supply

Capital Maintenance

- Replacement and major repairs – DOT

Class I On-Street Segments



These include segments with physically separated bike lanes in the roadbed as planned for Kent Avenue and West Street. These segments are wholly contained within NYC DOT property, but include landscaped medians, which NYC DOT does not maintain. DSNY should be responsible for plowing and mechanical broom service on these dedicated bikeways. The Leventhal Memorandum indicates NYC Parks as the responsible agency for maintaining the landscaped areas. BGI would assist Parks, DOT, and other property owners with litter removal and basic horticultural services.

Operating Maintenance

Hardscape

- Sweeping - DSNY
- Litter removal - Property owners, BGI, Parks
- Plowing - DSNY
- Repairs - DOT

Landscaped areas

- Litter removal – Property owners, BGI, Parks
- Weeding - Parks, BGI, Property owners
- Mulching- Parks, BGI, Property owners
- Watering - Parks, BGI, Property owners
- Seasonal planting and replacement - Property owners, BGI, Parks

Utilities

- Lighting equipment maintenance - DOT
- Electricity - DOT
- Water equipment maintenance
- Water supply

Capital Maintenance

- Replacement and major repairs - DOT

Waterfront Esplanades on Private Properties

Maintenance of privately managed, private properties that are part of the greenway will typically be provided by the property owner, as required under the terms of the New York City waterfront zoning and any waterfront access plan that has been prepared. An example is the Ikea waterfront route on Erie Basin which is included in Segment 27 – Erie Basin Esplanade in Exhibit 1. In the absence of a specific agreement, the hardscape and landscape maintenance and utility and capital replacement costs will be born solely by the private property owner and the property owner will be solely responsible for providing the necessary services. Subject to a specific agreement, BGI could assist the property owner with litter removal, mechanical broom sweeping and basic horticultural services.

Provision of Maintenance

Operating Maintenance

Hardscape

- Sweeping – Private property owner
- Litter removal - Private property owner
- Plowing - Private property owner
- Repairs - Private property owner

Landscaped areas

- Litter removal – Private property owner
- Weeding - Private property owner
- Mulching- Private property owner
- Watering - Private property owner
- Seasonal planting and replacement - Private property owner

Utilities

- Lighting equipment maintenance - Private property owner
- Electricity - Private property owner
- Water equipment maintenance - Private property owner
- Water supply - Private property owner

Capital Maintenance

Replacement and major repairs - Private property owner

Waterfront Esplanades Managed by NYC Parks & Recreation



On waterfront esplanades where NYC Department of Parks & Recreation assumes ownership or operational control, the agency assumes responsibility for the provision of all maintenance services. This would primarily apply to the waterfront esplanades in Greenpoint and Williamsburg. NYC Parks has contracted with the Open Space Alliance (OSA) to manage these waterfront esplanades and parks that result from the 2005 rezoning. Funding for these services are provided by the developers of the properties through common charges to residents or other means.

It would likely be most economical for mechanical broom service to be provided by a single greenway-wide mechanical broom operator servicing all off-street paths.

Where NYC Parks does not assume ownership or operational responsibility for maintenance, all maintenance responsibility is retained by the developer or property owner(s) subject to a management and operations agreement with NYC Parks.

Operating Maintenance

Hardscape

- Sweeping – NYC Parks/OSA
- Litter removal - NYC Parks/OSA
- Plowing - NYC Parks/OSA
- Repairs - NYC Parks/OSA

Landscaped areas

- Litter removal – NYC Parks/OSA
- Weeding - NYC Parks/OSA
- Mulching- NYC Parks/OSA
- Watering - NYC Parks/OSA
- Seasonal planting and replacement - NYC Parks/OSA

Utilities

- Lighting equipment maintenance - NYC Parks/OSA
- Electricity - NYC Parks/OSA
- Water equipment maintenance - NYC Parks/OSA
- Water supply - NYC Parks/OSA

Capital Maintenance

Replacement and major repairs – Private Owner/NYC Parks/OSA

Greenway Paths through Parks



In Parks, the respective parks agency retains full responsibility for maintenance of facilities within the park with one exception. NYC DOT provides power for lighting within NYC Parks.

Locations that fall in this category include the planned Bushwick Inlet Park, East River State Park, Brooklyn Bridge Park, Valentino Park in Red Hook and Red Hook Park.

It may be economical for mechanical broom service on these paths to be provided by a single provider for the entire greenway.

Operating Maintenance

Hardscape

- Sweeping – NYC Parks, NYS Parks, OSA
- Litter removal - NYC Parks, NYS Parks, and OSA
- Plowing - NYC Parks, NYS Parks, OSA
- Repairs - NYC Parks, NYS Parks, OSA

Landscaped areas

- Litter removal – NYC Parks, NYS Parks, and OSA
- Weeding - NYC Parks, NYS Parks, OSA
- Mulching- NYC Parks, NYS Parks, OSA
- Watering - NYC Parks, NYS Parks, OSA
- Seasonal planting and replacement - NYC Parks, NYS Parks, OSA

Provision of Maintenance

Utilities

- Lighting equipment maintenance - NYC Parks, NYS Parks, OSA
- Electricity – NYC Parks, NYS Parks, OSA
- Water equipment maintenance - NYC Parks, NYS Parks, OSA
- Water supply - NYC Parks, NYS Parks, OSA

Capital Maintenance

Replacement and major repairs - NYC Parks, NYS Parks, OSA

Class II and Class III Segments



Class II segments of the greenway are bike lanes within the road bed. Class III segments are shared travel lanes for bikes and motor vehicles within the road bed. These facilities lie solely within NYC DOT property. Operating maintenance is primarily provided by NYC Department of Sanitation (DSNY), which provides snow removal, mechanical broom service and emptying of trash receptacles on city streets. Capital maintenance and utility services are provided by NYC DOT.

Class II segments include Commercial Street, potentially Hudson, Water and Plymouth Streets, Van Dike Street, Clinton, Bush and Smith Streets and Hamilton and 3rd Avenues in Red Hook and Gowanus.

Operating Maintenance

Hardscape

- Sweeping – DSNY
- Litter removal - DSNY
- Plowing - DSNY, property owner
- Repairs - NYC DOT

Landscaped areas (tree pits)

- Litter removal – DSNY
- Weeding – Property owner
- Mulching- NA
- Watering - NYC Parks during establishment
- Tree replacement - NYC Parks

Utilities

- Lighting equipment maintenance - NYC DOT
- Electricity – NYC DOT
- Water equipment maintenance -NA
- Water supply - NA

Capital Maintenance

Replacement and major repairs - NYC DOT

The Leventhal Memorandum

In 1983, Deputy Mayor for Operations Nathan Leventhal established a policy for determining maintenance responsibility between agencies where responsibility may not be clear and capability may not be well matched with maintenance requirements. This policy, sometimes referred to as the “Leventhal Memorandum” was implemented following consultation with the operational agencies including NYC DOT, NYC Parks and DSNY. In setting out the principles for maintenance assignments the memorandum stated:

Assignments of jurisdiction within this directive are based on a joint agreement previously reached by the Departments of Sanitation, Transportation and Parks and Recreation after extensive field surveys. Criteria used in making these assignments include:

- *The similarity of the required tasks to operations currently performed by the assigned agencies;*
- *The presence within the assigned agency of those types of personnel and equipment needed to perform the cleaning and operation; and*
- *The potential for the assigned agency to integrate the cleaning of the properties into regularly scheduled operations.*

The assignment of jurisdiction for cleaning those types of properties defined in this directive implies no expectation that they will be given a higher priority by the assigned agency than other properties for which it is already responsible.

Assignments within the memorandum that are relevant to the Brooklyn Waterfront Greenway include:

Department of Parks – *The cleaning of those center malls, sitting areas, traffic islands, medians, triangles, etc. which are landscaped...*

Department of Sanitation – *shall clean...unlandscaped center malls, traffic islands, medians, triangles and sitting areas...and pedestrian walkways.... Tree pits located on unlandscaped center malls, medians, etc. Responsibility for cleaning alongside property of governmental bodies or agencies resides with the agency having jurisdiction over that property. When cleaning is not performed, the Department of Sanitation, consistent with its Charter and Code authority, shall seek compliance from these agencies.*

The Department of Transportation’s operating maintenance assignments were limited to property along arterial highways and cleaning of arterial highways.

A copy of the Leventhal memorandum is attached as Exhibit 3.

The memo suggests that NYC Parks should be responsible for landscaped medians and planted areas of the greenway. Where these areas are adjacent to the Red Hook Marine Terminal and the Brooklyn Navy Yard, there is a clear indication of their responsibility for keeping them clean. Unclear is responsibility for maintaining landscaping. Areas along the greenway that are not landscaped including tree pits appear to be assigned to the Department of Sanitation.

Process of Determining Maintenance Responsibility

NYC DOT has used construction contract documents to record responsibility for maintenance of capital projects. The Maintenance and Jurisdiction Plan (MJ) is comprised of a plan view drawing that identifies all of the areas requiring maintenance and a table that provides relevant details about each area and lists the entities responsible for maintaining them. See excerpts for the MJ for the South Bronx Greenway in Exhibit 4. The Brooklyn Waterfront Greenway Maintenance & Jurisdiction Plan will become an appendix to this document when completed during design.



Need for a Memorandum of Understanding or Other Multi-Party Agreement

While Maintenance Jurisdiction Plans document responsibility, they do not automatically result in an increase in agency operational budgets to fund the increased responsibility. Agencies will typically prefer for maintenance responsibilities not to be increased unless the operational budget is proportionately increased. In some cases where this cannot be achieved a memorandum of understanding with an interested third party that can supplement maintenance funding, such as a conservancy, provides the vehicle for assuring adequate maintenance.

Because of the multi-party ownership of the Brooklyn Waterfront Greenway right of way and the multi-party jurisdictional responsibility, a memorandum of understanding between the public

agency and non-public agency participants will serve to formalize the Maintenance Jurisdiction Plan into a comprehensive management scheme that can assure a satisfactory and reliable level of maintenance.

The parties to such an agreement should include:

- NYC DOT
- NYC Department of Parks & Recreation
- NYC Economic Development Corporation
- The Port Authority of NY & NJ
- Brooklyn Navy Yard Development Corporation
- Brooklyn Greenway Initiative

Services that Can be Provided by BGI

Landscape Maintenance

Brooklyn Greenway Initiative can supplement agency and private maintenance of landscaped areas through an Adopt-the-Greenway program. The Adopt-a-Greenway program will be marketed to businesses similarly to the corporate sponsorship of some GreenStreets sites. Brooklyn Greenway Initiative will also recruit businesses along the greenway to provide or contribute directly to routine landscape maintenance. For example, Brinks, Inc. at the Brooklyn Navy Yard has offered to maintain the greenway adjacent to its property.

Brooklyn Greenway Initiative will also engage gardeners in neighborhoods to adopt “gateway gardens” and maintain them throughout the year. These gardens can be planned during greenway design with the participation and buy-in of the local gardeners.

In addition to gardening services, partnerships with Horticultural Society of New York and provide compensation and experience in horticulture, gardening and landscape management to at-risk young people introducing them to possible new career avenues. The Horticultural Society has successfully implemented its Green Team and Green Collar Mentoring Series throughout New York City.

With an eight year history maintaining NYC DOT Adopt-a-Highway sites with volunteers and professional landscapers, Brooklyn Greenway Initiative has the ability to deploy volunteers and professionals to address landscaping requirements.

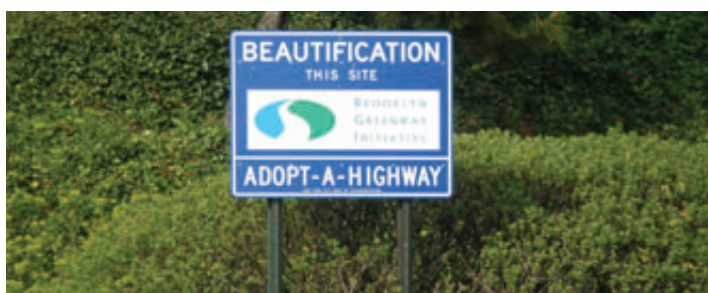
Agencies such as NYC Parks & Recreation may determine it to be more cost effective to subcontract landscape maintenance (or plowing – see below) to Brooklyn Greenway Initiative

Mechanical Broom Operations



Brooklyn Greenway Initiative can fill an important gap in the routine cleaning of greenway paths by providing mechanical broom operations over much of the more widely defined greenway. The cleaning of sidewalks at the Navy Yard and Marine terminal are clearly the responsibility of those agencies. Dual greenway paths constitute more area than simple sidewalks, however.

Standards for greenway path cleaning should perhaps be higher than for the typical sidewalk in order to make them attractive for recreational use. Many greenway segments are adjacent to truck routes where sidewalks accumulate a higher than normal load of debris. Please see picture below.



Services that Can be Provided by BGI

Mechanical Brooms and their operations are costly, but they are the most cost effective way to maintain extensive paved areas at adequate frequency to keep them clean. Where paths are within a road bed and supported by a thick concrete base, DSNY mechanical brooms can provide the service. In many parts of Brooklyn, street sweeping is currently being reduced to once a week.

On paths that are off-street, such as at the Navy Yard and the Port, a lighter mechanical broom is called for. There Brooklyn Greenway Initiative can provide mechanical broom services. Hudson River Park Trust recently evaluated equipment and purchased a Sentinel mechanical broom made by Tennant. See specifications in Exhibit 4. The authors also investigated mechanical broom equipment and have concluded that the Tennant Sentinel offers the best performance and capabilities for operations over significant distances, of the equipment evaluated.

Only one mechanical broom like the sentinel would be needed for the off-street paths over the entire planned 14 miles of the Brooklyn Waterfront Greenway. It would also have the capacity to clean paths on esplanades, in parks, on sidewalks and on private properties if contributions to its operations are made by:

- NYC Parks/OSA for esplanades and parks
- BNYDC and Port Authority for paths at their properties
- NYC EDC at Piers 11 & 12
- Brooklyn Bridge Park
- Private owners such as Ikea and at waterfront esplanades not managed by NYC Parks

A maintenance operation based at the Brooklyn Navy Yard with a secondary base at the Port Authority facility at Pier 9 could service the entire route.

Plowing

Unlike mechanical broom operations, snow plowing on greenway paths may be more efficiently achieved under a distributed model as all paths will need to be plowed at the same time rather than on a predetermined weekly schedule. Plowing of paths on roadbeds can be performed by DSNY. Plowing of parks and esplanades under NYC Park's jurisdiction can be performed by NYC Parks. An agreement for plowing at the Brooklyn Navy Yard and the Red Hook Marine Terminal to be provided by the BNYDC and Port Authority, respectively is one option for the off-street class I paths. Brooklyn Greenway Initiative will coordinate with all parties to assure that greenway paths are plowed on a timely basis.

If there are gaps or of priorities preclude timely plowing of greenway paths and walks, light weight, multi function equipment such as the Bobcat 5600 shown in Exhibit 5, or comparable equipment from John Deere and others operated by Brooklyn Greenway Initiative, would also support landscape maintenance and litter removal work.

Routine Maintenance During Development

It should be an objective of all parties concerned with the development and maintenance of the greenway for each new section built to be maintained at a satisfactory standard following its opening

to the public. Initially, this needs to involve sweeping, litter removal and plowing primarily. A transition program to provide those services should be devised in 2009 with the completion of the first phase of the greenway on Columbia Street. If the sidewalks are swept less often than the streets, for example, cyclists may chose to avoid paths that are littered with debris thrown up by the street sweepers, defeating the purpose of the greenway.

On August 9, 2008, for example, Brooklyn Greenway Initiative volunteers conducted a clean-up of the new Columbia Street greenway



including weeding the tree pits that had become overgrown.

Programming

Events and programs can add to the vitality of the greenway and to the sense of connection to the facility felt by area residents.

- Walking and Bike Tours. Brooklyn Greenway Initiative currently sponsors an annual "Future Waterfront Greenway Bike Tour". This will continue and as the greenway is built additional tours will be added such as:
 - oEpic Brooklyn Waterfront Bike Tour from Greenpoint to Jamaica Bay
 - oGreenway 5k and 10k runs
 - oChildren's bike tours
 - oSeniors walking clubs
 - oHistory walks and bike tours
 - oEnvironmental walks and bike tours
 - oArchitectural walks and bike tours.
- Seasonal greenway clean-ups and landscaping days
- Gateway Gardens adopted by local neighborhood gardeners
- Cross Promotion of Park Events across the greenway with valet bike parking

Funding for Maintenance

Brooklyn Greenway Initiative is developing approaches to secure supplementary funding for greenway maintenance and operations. Some of the approaches being developed are:

- Establishing a membership program
- Building a maintenance reserve
- Establishing an Adopt-the-Greenway program
- Negotiating commitments from other stakeholders
- Continuing to investigate the feasibility of special assessment district status

Exhibit 1 - Maintenance Costs of Existing Parks & Greenways

Exhibit 1 – Maintenance Costs of Existing Parks & Greenways

Park	Size*	Area (acres)	Maintenance Spectrum**	Borough	Total Operating Budget + Security (\$)	Total Operating Budget + Security (\$/acre/yr)	Non-recurring maintenance costs (\$/acre/yr)	Recurring maintenance costs (\$/acre/yr)	Management & Administration costs (\$/acre/yr)	Programming costs (\$/acre/yr)	Security (\$/acre/yr)	Ownership	Management	Maintenance Funding	Service Component**
Stuyvesant Cove (FY07)	Small	1.9	3	Manhattan	\$197,125	\$103,750	\$5,000	\$51,000	\$32,750	\$15,000	EDC	Public (City+Other authority)	+ non-profit	+ various public + non-profit	AA
Hudson River Park (FY06)	Large	54	2	Manhattan	\$11,717,212	\$216,985	\$24,404	\$92,503	\$56,637	\$10,463	\$36,889	Public (City+State)	Trust	Trust	AAA
Brooklyn Bridge Park (Proposed)	Large	81.71	3	Brooklyn	\$14,932,089	\$182,745	\$25,211	\$19,217	\$14,686		\$23,631	Public (City Parks)	+ lease, licensing, concession agreement + special permit	+ commercial entity	AAA
Battery Park City Park (FY07)	Medium	35.27	3	Manhattan	\$89,381,796	\$253,421	\$1,418	\$146,353	\$41,712	\$27,080	\$36,889	Public (BP/CNA)	+ public authority + Conservancy has significant responsibility	+ Conservancy, Trust	AAA
Revco Bank State Park (FY06)	Medium	28	3	Manhattan	\$6,830,160	\$243,577	\$34,369	\$38,912	\$103,755	\$12,969	\$53,571	Public (State)	+ public agency	+ various public funding	AAA
Riverside South (FY07)	Medium	16.8	2	Manhattan	\$1,216,774	\$72,427	\$12,479	\$29,159	\$3,274	\$9,184	\$18,331	Public (City Parks)	+ City/State PARKS	+ maintenance fund/enhancement from development	AA
Bakerson Clomont State Park (FY06)	Medium	22	2	Brooklyn	\$2,400,057	\$109,094	\$15,622	\$17,687	\$47,161	\$5,895	\$22,727	Public (State)	+ public agency	+ various public funding	AA
Seward Cove (FY07)	Small	5	1	Manhattan	\$405,122	\$81,024	\$0	\$66,663	\$19,842	\$520	\$0	Public (City Parks)	+ non-profit	+ various public funding	A
Grant Plaza State Park (FY06)	Small	2.5	2	Queens	\$240,000	\$96,000	N/A	N/A	N/A	N/A	\$0	Public (State)	+ public agency	+ various public funding	A
Hudson Piers (EDC Proposed)	Medium	1	2	Brooklyn	\$221,540	\$221,540	\$45,140	\$110,000	\$66,400		\$0	Public (EDC)	unknown	unknown	A

Definitions:

Non-recurring Maintenance Costs:

Recurring Maintenance Costs:

Management Costs:

Security:

Programming:

Capital Repairs and replacement
Cleaning, maintenance, horticulture, non-managerial operations, utilities
Management, administration, supervision salaries and supplies (personnel and non-personnel)
Different levels of paid security
Park programs, fundraising, salaries and associated fees

*Size:	**Maintenance Spectrum	***Amenity Components	Justification
Small:	1-	A	Baseline for every park
Medium:	2-	AA	"A" + Horticulture + Amenities (restrooms, drinking fountains et
Large	3-	AAA	"AA" + Security + Programming

Exhibit 2 - Maintenance Budget

	Segment 1 Commercial Street	Segment 2 West Street	Segment 3 Waterfront Esplanade	Segment 4 Bushwick Inlet Park	Segment 5 Kent Ave	Segment 6 Kent Ave	Segment 7 Waterfront Esplanade
Start	Manhattan	Eagle	Manhattan	Quay	Quay	North 7	North 7
Finish	West	Quay	Quay	North 7	North 7	Clymer	North 3
Typology	Class II - Striped	Class I 18 Ft	Wfrnt Esplanade	In Park	Class I 18 Ft	Class I 18 Ft	Wfrnt Esplanade
Linear Feet	2,127	3,349	6,426	4,623	2,916	6,440	1,087
Section Width	10	18	40	30	18	18	40
Section Area	21,270	60,282	257,040	138,690	52,488	115,920	43,480
Hardscape %	100%	56%	50%	73%	56%	56%	50%
Landscape %	0%	44%	50%	27%	44%	44%	50%
Hardscape Area	21,270	33,490	128,520	101,706	29,160	64,400	21,740
Landscape Area	-	26,792	128,520	36,984	23,328	51,520	21,740
Hardscape Cost @ \$0.55	\$ 11,699	\$ 18,420	\$ 70,686	\$ 55,938	\$ 16,038	\$ 35,420	\$ 11,957
Landscape Cost @ \$0.42	\$ -	\$ 11,253	\$ 53,978	\$ 15,533	\$ 9,798	\$ 21,638	\$ 9,131
Maintenance Cost	\$ 11,699	\$ 29,672	\$ 124,664	\$ 71,472	\$ 25,836	\$ 57,058	\$ 21,088
Maintenance Contingency @ 10%	\$ 1,170	\$ 2,967	\$ 12,466	\$ 7,147	\$ 2,584	\$ 5,706	\$ 2,109
Annual Landscape Maintenance Cost	\$ 12,868	\$ 32,639	\$ 137,131	\$ 78,619	\$ 28,419	\$ 62,764	\$ 23,197
Park Lighting @ \$0.11	\$ 2,340	\$ 6,631	\$ 28,274	\$ 15,256	\$ 5,774	\$ 12,751	\$ 4,783
Utility Cost	\$ 2,340	\$ 6,631	\$ 28,274	\$ 15,256	\$ 5,774	\$ 12,751	\$ 4,783
Utility Contingency @ 10%	\$ 234	\$ 663	\$ 2,827	\$ 1,526	\$ 577	\$ 1,275	\$ 478
Annual Utility Expense	\$ 2,574	\$ 7,294	\$ 31,102	\$ 16,781	\$ 6,351	\$ 14,026	\$ 5,261
Construction Cost Estimate (\$568/linear ft)	\$ 1,208,519	\$ 1,902,835	\$ 3,651,125	\$ 2,626,696	\$ 1,656,813	\$ 3,659,079	\$ 617,612
Annual Capital Maintenance @ 0.5%	\$ 6,043	\$ 9,514	\$ 18,256	\$ 13,133	\$ 8,284	\$ 18,295	\$ 3,088
Total Direct Maintenance Costs	\$ 21,485	\$ 49,448	\$ 186,488	\$ 108,534	\$ 43,054	\$ 95,086	\$ 31,546

	Segment 16 Navy Street	Segment 17 Hudson/Water/ Plymouth Sts	Segment 18 Brooklyn Bridge Park	Segment 19 Atlantic Ave	Segment 20 Columbia Street	Segment 21 Degraw Street	Segment 22 Van Brunt Street
Start	Sand St	York St	Old Fulton	Brooklyn Bridge Park	Atlantic	Columbia	Degraw
Finish	York St	Old Fulton	Atlantic Ave	Columbia	Degraw	Van Brunt	Summit
Typology	Class I 24 Ft	Class II	In Park	Class I 30 Ft	Class I 30 Ft	Class I 30 Ft	Class I 30 Ft
Linear Feet	565	8,093	4,354	407	2,245	564	3,259
Section Width	24	10	30	30	30	30	30
Section Area	13,560	80,930	130,620	12,210	67,350	16,920	97,770
Hardscape %	79%	100%	73%	73%	73%	73%	73%
Landscape %	21%	0%	27%	27%	27%	27%	27%
Hardscape Area	10,735	80,930	95,788	8,954	49,390	12,408	71,698
Landscape Area	2,825	-	34,832	3,256	17,960	4,512	26,072
Hardscape Cost @ \$0.55	\$ 5,904	\$ 44,512	\$ 52,683	\$ 4,925	\$ 27,165	\$ 6,824	\$ 39,434
Landscape Cost @ \$0.42	\$ 1,187	\$ -	\$ 14,629	\$ 1,368	\$ 7,543	\$ 1,895	\$ 10,950
Maintenance Cost	\$ 7,091	\$ 44,512	\$ 67,313	\$ 6,292	\$ 34,708	\$ 8,719	\$ 50,384
Maintenance Contingency @ 10%	\$ 709	\$ 4,451	\$ 6,731	\$ 629	\$ 3,471	\$ 872	\$ 5,038
Annual Landscape Maintenance Cost	\$ 7,800	\$ 48,963	\$ 74,044	\$ 6,921	\$ 38,178	\$ 9,591	\$ 55,423
Park Lighting @ \$0.11	\$ 1,492	\$ 8,902	\$ 14,368	\$ 1,343	\$ 7,409	\$ 1,861	\$ 10,755
Utility Cost	\$ 1,492	\$ 8,902	\$ 14,368	\$ 1,343	\$ 7,409	\$ 1,861	\$ 10,755
Utility Contingency @ 10%	\$ 149	\$ 890	\$ 1,437	\$ 134	\$ 741	\$ 186	\$ 1,075
Annual Utility Expense	\$ 1,641	\$ 9,793	\$ 15,805	\$ 1,477	\$ 8,149	\$ 2,047	\$ 11,830
Construction Cost Estimate (\$568/linear ft)	\$ 321,022	\$ 4,598,281	\$ 2,473,856	\$ 231,249	\$ 1,275,564	\$ 320,454	\$ 1,851,699
Annual Capital Maintenance @ 0.5%	\$ 1,605	\$ 22,991	\$ 12,369	\$ 1,156	\$ 6,378	\$ 1,602	\$ 9,258
Total Direct Maintenance Costs	\$ 11,046	\$ 81,747	\$ 102,218	\$ 9,555	\$ 52,706	\$ 13,241	\$ 76,511

Start	Total
Finish	
Typology	
Linear Feet	79,720
Section Width	
Section Area	2,097,120
Hardscape %	64%
Landscape %	36%
Hardscape Area	1,341,578
Landscape Area	755,542
Hardscape Cost @ \$0.55	\$ 737,868
Landscape Cost @ \$0.42	\$ 317,328
Maintenance Cost	\$ 1,055,196
Maintenance Contingency @ 10%	\$ 105,520
Annual Landscape Maintenance Cost	\$ 1,160,715
Park Lighting @ \$0.11	\$ 230,683
Utility Cost	\$ 230,683
Utility Contingency @ 10%	\$ 23,068
Annual Utility Expense	\$ 253,752
Construction Cost Estimate (\$568/linear ft)	\$ 45,295,310
Annual Capital Maintenance @ 0.5%	\$ 226,477
Total Direct Maintenance Costs	\$ 1,640,943

Exhibit 2 - Maintenance Budget

Segment 8 Waterfront Esplanade	Segment 9 Kent Ave	Segment 10 Williamsburg Place	Segment 11 Flushing Ave	Segment 12 Flushing Ave	Segment 13 Flushing Ave	Segment 14 Flushing Ave	Segment 15 Navy Street
Grand Street Navy Yard Wfrrt Esplanade	Clymer Williamsburg St Class I 18 Ft	Williamsburg St Flushing Class I 30 Ft	Williamsburg Place Ryerson Class I 30 Ft	Ryerson Vanderbuilt Class I 30 Ft	Vanderbuilt Adelphi Class I 24 Ft	Adelphi Navy St Class I 30 Ft	Flushing Sand St Class I 30 Ft
4,196	1,929	832	793	1,364	813	1,832	498
40	22	30	30	30	24	30	30
167,840	42,438	24,960	23,790	40,920	19,512	54,960	14,940
50%	82%	73%	73%	73%	79%	73%	73%
50%	18%	27%	27%	27%	21%	27%	27%
83,920	34,722	18,304	17,446	30,008	15,447	40,304	10,956
83,920	7,716	6,656	6,344	10,912	4,065	14,656	3,984
\$ 46,156	\$ 19,097	\$ 10,067	\$ 9,595	\$ 16,504	\$ 8,496	\$ 22,167	\$ 6,026
\$ 35,246	\$ 3,241	\$ 2,796	\$ 2,664	\$ 4,583	\$ 1,707	\$ 6,156	\$ 1,673
\$ 81,402	\$ 22,338	\$ 12,863	\$ 12,260	\$ 21,087	\$ 10,203	\$ 28,323	\$ 7,699
\$ 8,140	\$ 2,234	\$ 1,286	\$ 1,226	\$ 2,109	\$ 1,020	\$ 2,832	\$ 770
\$ 89,543	\$ 24,572	\$ 14,149	\$ 13,486	\$ 23,196	\$ 11,223	\$ 31,155	\$ 8,469
\$ 18,462	\$ 4,668	\$ 2,746	\$ 2,617	\$ 4,501	\$ 2,146	\$ 6,046	\$ 1,643
\$ 18,462	\$ 4,668	\$ 2,746	\$ 2,617	\$ 4,501	\$ 2,146	\$ 6,046	\$ 1,643
\$ 1,846	\$ 467	\$ 275	\$ 262	\$ 450	\$ 215	\$ 605	\$ 164
\$ 20,309	\$ 5,135	\$ 3,020	\$ 2,879	\$ 4,951	\$ 2,361	\$ 6,650	\$ 1,808
\$ 2,384,083	\$ 1,096,019	\$ 472,726	\$ 450,567	\$ 774,998	\$ 461,930	\$ 1,040,906	\$ 282,954
\$ 11,920	\$ 5,480	\$ 2,364	\$ 2,253	\$ 3,875	\$ 2,310	\$ 5,205	\$ 1,415
\$ 121,772	\$ 35,187	\$ 19,533	\$ 18,617	\$ 32,022	\$ 15,894	\$ 43,010	\$ 11,691

Segment 22 Van Brunt Street	Segment 23 Pier 11 Street	Segment 24 Ferris Street	Segment 25 Beard Street	Segment 26 Watrefront Esplanade	Segment 27 Erie Basin Esplanade	Segment 28 Columbia St Esplanade	Segment 29 Red Hook Park	Segment 30 Halleck/Smith Streets	Segment 31 Hamilton Ave
Degraw Summit Class I 30 Ft	Imlay Ferris Class I 30 Ft	King Van Dike Class I 30 Ft	Van Dike Columbia Class II	Ferries Van Brunt Pier Wfrrt Esplanade	Van Brunt Columbia Wfrrt Esplanade	Bay Pier Wfrrt Esplanade	Columbia Court In Park	Court Hamilton Class II	Smith 15th St Class II
3,259	515	1,440	2,253	4,006	3,251	3,154	1,886	2,691	1,812
30	30	30	10	40	40	40	30	10	10
97,770	15,450	43,200	22,530	160,240	130,040	126,160	56,580	26,910	18,120
73%	73%	73%	100%	50%	50%	50%	73%	100%	100%
27%	27%	27%	0%	50%	50%	50%	27%	0%	0%
71,698	11,330	31,680	22,530	80,120	65,020	63,080	41,492	26,910	18,120
26,072	4,120	11,520	-	80,120	65,020	63,080	15,088	-	-
\$ 39,434	\$ 6,232	\$ 17,424	\$ 12,392	\$ 44,066	\$ 35,761	\$ 34,694	\$ 22,821	\$ 14,801	\$ 9,966
\$ 10,950	\$ 1,730	\$ 4,838	\$ -	\$ 33,650	\$ 27,308	\$ 26,494	\$ 6,337	\$ -	\$ -
\$ 50,384	\$ 7,962	\$ 22,262	\$ 12,392	\$ 77,716	\$ 63,069	\$ 61,188	\$ 29,158	\$ 14,801	\$ 9,966
\$ 5,038	\$ 796	\$ 2,226	\$ 1,239	\$ 7,772	\$ 6,307	\$ 6,119	\$ 2,916	\$ 1,480	\$ 997
\$ 55,423	\$ 8,758	\$ 24,489	\$ 13,631	\$ 85,488	\$ 69,376	\$ 67,306	\$ 32,073	\$ 16,281	\$ 10,963
\$ 10,755	\$ 1,700	\$ 4,752	\$ 2,478	\$ 17,626	\$ 14,304	\$ 13,878	\$ 6,224	\$ 2,960	\$ 1,993
\$ 10,755	\$ 1,700	\$ 4,752	\$ 2,478	\$ 17,626	\$ 14,304	\$ 13,878	\$ 6,224	\$ 2,960	\$ 1,993
\$ 1,075	\$ 170	\$ 475	\$ 248	\$ 1,763	\$ 1,430	\$ 1,388	\$ 622	\$ 296	\$ 199
\$ 11,830	\$ 1,869	\$ 5,227	\$ 2,726	\$ 19,389	\$ 15,735	\$ 15,265	\$ 6,846	\$ 3,256	\$ 2,193
\$ 1,851,699	\$ 292,613	\$ 818,179	\$ 1,280,110	\$ 2,276,129	\$ 1,847,153	\$ 1,792,040	\$ 1,071,587	\$ 1,528,972	\$ 1,029,542
\$ 9,258	\$ 1,463	\$ 4,091	\$ 6,401	\$ 11,381	\$ 9,236	\$ 8,960	\$ 5,358	\$ 7,645	\$ 5,148
\$ 76,511	\$ 12,091	\$ 33,807	\$ 22,757	\$ 116,258	\$ 94,347	\$ 91,532	\$ 44,277	\$ 27,182	\$ 18,303

Exhibit 3 - Leventhal Memorandum



THE CITY OF NEW YORK
OFFICE OF THE MAYOR
NEW YORK, N.Y. 10007

NATHAN LEVENTHAL
DEPUTY MAYOR FOR OPERATIONS

TO: Commissioner Anthony Ameruso
Commissioner Gordon Davis
Commissioner Norman Steisel

FROM: Nathan Leventhal

DATE: January 17, 1983

SUBJECT: Assignments of Jurisdiction for Cleaning Certain City Properties

This directive assigns agency jurisdiction for the cleaning of certain categories of City-owned properties, specifically including: center malls, traffic islands, triangles, medians, overpasses, underpasses, step streets, safety zones, pedestrian walkways, sidewalks along City-owned properties, dead-end streets, and areas along railroads or subway lines. All previous directives, memos and agreements concerning these properties, if contradicted by this directive, are hereby superseded.

I. PURPOSE AND GENERAL PRINCIPLES

The absence of clearly defined agency jurisdiction for the cleaning of these properties has contributed to their not being adequately cleaned and has resulted in considerable confusion at the community level regarding which agency to contact with service requests. This directive is intended to address these problems by clearly assigning agency jurisdiction for the properties defined in Section II of this document.

Exhibit 3 - Leventhal Memorandum

Assignments of jurisdiction within this directive are based on a joint agreement previously reached by the Departments of Sanitation, Transportation, and Parks and Recreation after extensive field surveys. Criteria used in making these assignments include:

- o The similarity of required tasks to operations currently performed by the assigned agencies;
- o The presence within the assigned agency of those types of personnel and equipment needed to perform the cleaning operation; and
- o The potential for the assigned agency to integrate the cleaning of these properties into regularly scheduled operations.

The assignment of jurisdiction for cleaning those properties defined in this directive, implies no expectation that they will be given a higher priority by the assigned agency than other properties for which it is already responsible. It is understood that the adequate cleaning of all of the properties covered by this directive would necessitate resources that are not currently available. The lack of resources, however, does not diminish the logic of assigning jurisdictions as presented in this directive, which should facilitate the structuring of service priorities by both the operating agencies and the communities they serve. Resource needs should be addressed through the budget process.

The jurisdictional assignments stated herein shall not be construed to prevent one agency from assisting another where availability of resources permits, nor shall they be construed to allow an agency to refuse a reasonable request for assistance on purely jurisdictional grounds, when needed resources are available to the agency receiving the request.

II. DEFINITIONS

A. Property Categories

The property categories for which jurisdictional assignments are being made are defined as follows:

Exhibit 3 - Leventhal Memorandum

1. Center malls, traffic islands, triangles, medians:

Areas of various shapes, sizes, and materials located fully within the beds of roadways, raised above the level of the roadway and/or physically separated from the roadway by curbing or other barriers. These properties are further sub-categorized as landscaped or unlandscaped:

Landscaped properties are defined as those consisting predominantly of grass, bushes, trees or other planned vegetation which require maintenance in the form of mowing, pruning, or other similar treatment.

Unlandscaped properties are defined as properties which are predominantly hard-surfaced or were originally designed and constructed to be hard-surfaced areas (asphalt, hex block, belgian block, cobbled areas and the like) including those properties which a) now contain volunteer growth; b) which are predominantly hard-surfaced but contain occasional tree pits or planters; or c) where vegetation is limited to a minor portion of the overall property.

2. Overpasses:

Vehicular and/or pedestrian thoroughfares over highways, railroad lines, etc., including sidewalk areas if present.

3. Underpasses:

Vehicular and/or pedestrian thoroughfares under highways, bridges, etc., including sidewalk areas if present.

4. Safety Zones:

Areas delineated by stripes, reflectors, or other markings in the bed of a roadway noting zones forbidden for traffic or parking.

5. Step Streets:

City-owned staircases (whether mapped as staircases or not) leading from one sidewalk level to another.

Exhibit 3 - Leventhal Memorandum

6. Sitting Areas:

Areas of various shapes, sizes, and materials located fully within the beds of roadways, raised above the level of the roadway and/or physically separated from the roadway by curbing or other barriers, which contain benches or other facilities for recreational use. Such areas may also be either landscaped or unlandscaped as defined in II.A.1.

7. Properties Abutting Railways, Subways:

Properties adjacent to railways and subways which fall under the jurisdiction of agencies not party to this document.

8. Pedestrian Walkways:

Paved and unpaved walkways located on or alongside City-owned property other than those adjacent to arterial highways.

B. Definition of Cleaning:

When referred to in this directive, the task of cleaning shall also include weed removal, where appropriate, and snow removal when required for pedestrian and/or vehicular safety.

III. ASSIGNED AGENCY JURISDICTIONS

A. Department of Sanitation

1. The Department of Sanitation shall clean the following City-owned properties: unlandscaped center malls; traffic islands, medians, triangles and sitting areas; underpasses; overpasses; safety zones; step streets; throw-out areas at the end of dead-end streets; and pedestrian walkways, and/or other strips of City-owned property adjacent to City streets, (except as limited by III.A.2). Tree pits located on unlandscaped center malls, medians, etc., shall also be cleaned by the Department of Sanitation. (Vacant lots are currently cleaned by and are the responsibility of the Department of Sanitation's Vacant Lot Program and are therefore not addressed within the context of this directive).

Exhibit 3 - Leventhal Memorandum

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Exhibit 3 - Leventhal Memorandum

2. Responsibility for cleaning alongside subways, railways and developed properties belonging to governmental bodies or agencies (including those of the City) resides with the agency having jurisdiction for that property. When cleaning is not performed, the Department of Sanitation, consistent with its Charter and Code authority, shall seek compliance from these agencies.
3. Responsibility for snow removal on arterial highways shall remain with the Department of Sanitation as it is currently assigned.

B. Department of Parks and Recreation

1. The cleaning of those center malls, sitting areas, traffic islands, medians, triangles, etc. which are landscaped shall be the responsibility of the Department of Parks and Recreation.
2. In addition to the cleaning to be provided by the Department of Sanitation, tree pits located on unlandscaped center malls, etc., shall be cleaned by the Department of Parks and Recreation at such time as forestry work is performed.
3. The cleaning of all areas and properties including center malls, traffic islands, etc., which are located entirely within the boundaries of any park (except certain properties located within the right-of-way of arterial highways which are determined to be the responsibility of the Department of Transportation), shall be the responsibility of the Department of Parks and Recreation.

C. Department of Transportation

1. The Department of Transportation shall clean those properties regardless of surface, on or along arterial highways (excluding those portions which run through parks which are deemed not to be the responsibility of the Department of Transportation) including those which are part of exits and entrances to an arterial highway, extending outward from the roadway until they reach: a) a fence or other barrier designed to limit access to the main road; b) the curb of a City street, service road, or other roadway which is not an arterial highway; or c) a cliff or steep embankment which restricts passage beyond that point.

Exhibit 4 - Maintenance & Jurisdiction Plan S. Bronx Greenway

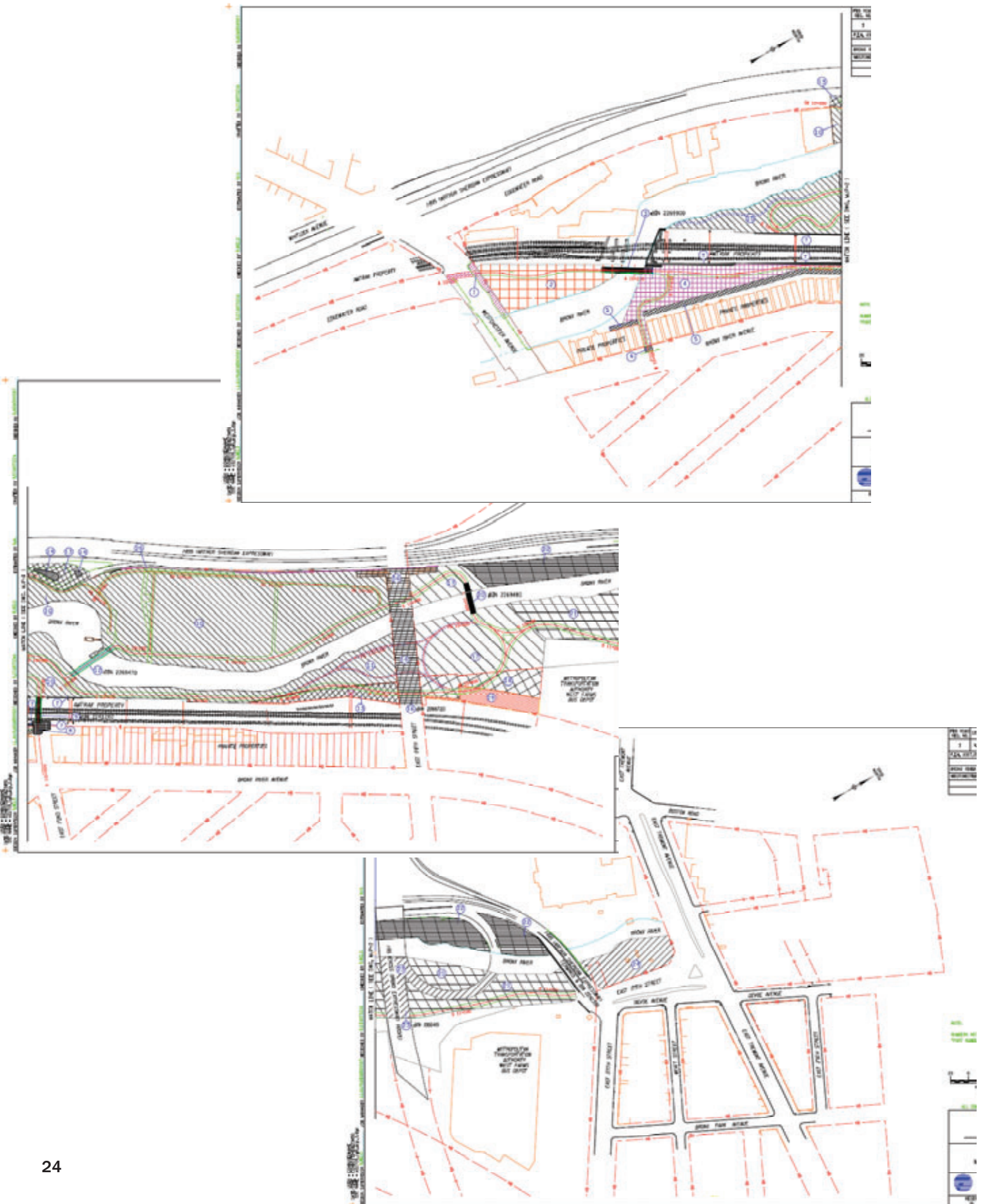


Exhibit 4 - Maintenance & Jurisdiction Plan S. Bronx Greenway

PART NO. (SEE MAINTENANCE JURISDICTION PLAN)	DESCRIPTION	APPROXIMATE LIMITS	GENERAL FEATURES TO BE MAINTAINED PERTAINING TO THIS PROJECT	OWNERSHIP	MAINTENANCE
GENERAL	ENTIRE PROJECT	WESTCHESTER AVENUE TO EAST TREMONT AVENUE	LIGHTING	NEW YORK CITY DEPARTMENT OF TRANSPORTATION (NYC DOT), OWNERSHIP NYC AS PARKLAND, NYC AS CITY STREETS, MTA, AND NYC DOT.	NEW YORK CITY DEPARTMENT OF TRANSPORTATION (NYC DOT) NYC DOT DIVISION OF STREET LIGHTS INSTALLED IN THE DEPARTMENT OF TRANSPORTATION (NYC DOT).
GENERAL	ENTIRE PROJECT	WESTCHESTER AVENUE TO EAST TREMONT AVENUE	SNOW AND ICE REMOVAL, GRASSY AREA REMOVAL, COLLECTION OF LITTER FROM SIDEWALK SURFACE AND CURBSIDE DRAINAGE CLEANOUT AND REPAIR, MOVING, INVASIVE PLANT SPECIES CONTROL AND REMOVAL, SIGNING AND STRIPING REPLACEMENT AND PAVEMENT MAINTENANCE TO INSURE A SAFE AND ROADABLE SURFACE SITE UTILITY REPAIR AND MAINTENANCE, BENCH AND SEAT WALL REPAIR AND REPLACEMENT, FENCES AND GATES REPAIR AND REPLACEMENT.	NYC AS PARKLAND, NYC AS CITY STREETS, MTA, AND NYC DOT.	NEW YORK CITY DEPARTMENT OF TRANSPORTATION (NYC DOT) NYC DOT DIVISION OF STREET LIGHTS INSTALLED IN THE DEPARTMENT OF TRANSPORTATION (NYC DOT).
1	WESTCHES TER AVENUE	ADJUTANT TO THE BROOK RIVER	PAVEMENT SIGNALS, SIGNING, CURBS, STRIPING AND NORTH SIDEWALK.	NYC OWNERSHIP DURING AND AFTER PROJECT COMPLETION AS CITY STREET.	NYC DOT IS RESPONSIBLE FOR MAINTENANCE AND NYC DOT DIVISION OF STREET LIGHTS INSTALLED IN THE SECTION 7-210 OF THE N.Y.C. REQUESTS OF ADJACENT PARCELS.
2	MAY 106 PARCEL 105 MAY 105 PARCEL 105	STATION A 10+00 TO A 10+165	ALL INFRASTRUCTURE AND NATURAL RESOURCES.	NYC DOT OWNERSHIP UNTIL PROJECT COMPLETION OR WHEN DETERMINED BY NYCDOT.	NYC DOT IS RESPONSIBLE FOR MAINTENANCE AND NYC DOT DIVISION OF STREET LIGHTS INSTALLED IN THE SECTION 7-210 OF THE N.Y.C. REQUESTS OF ADJACENT PARCELS.
3	B.I.N. 228900	STATION A 10+165 TO A 10+220	BRIDGE AND ALL ASSOCIATED COMPONENTS.	ADJUTANTS ARE WITHIN PART NUMBERS 2 AND 4. NYCDOT AGREES TO ACCEPT OWNERSHIP AS PARKLAND PERSONALITY FOR E.L.A. 228900 ONE THOUSAND TWO HUNDRED EIGHTY-NINE REGARDLESS OF WHEN PROPERTY TRANSFERS OCCUR FOR PART NUMBERS 2 AND 4.	NYCDOT IS RESPONSIBLE FOR MAINTENANCE AND NYC DOT DIVISION OF STREET LIGHTS INSTALLED IN THE SECTION 7-210 OF THE N.Y.C. REQUESTS OF ADJACENT PARCELS.
4	MAY 106 PARCEL 105	STATION A 10+190 TO A 10+225	ALL INFRASTRUCTURE AND NATURAL RESOURCES.	NYC DOT OWNERSHIP UNTIL PROJECT COMPLETION AGREES TO ACCEPT OWNERSHIP AS PARKLAND PROJECT COMPLETION ON AS DETERMINED BY NYCDOT.	NYCDOT IS RESPONSIBLE FOR MAINTENANCE AND NYC DOT DIVISION OF STREET LIGHTS INSTALLED IN THE SECTION 7-210 OF THE N.Y.C. REQUESTS OF ADJACENT PARCELS.

5	<p>MAP 110, PARCEL 113</p> <p>MAP 111, PARCEL 114</p> <p>MAP 112, PARCEL 115</p> <p>MAP 113, PARCEL 116</p> <p>MAP 114, PARCEL 117</p> <p>MAP 115, PARCEL 118</p> <p>MAP 116, PARCEL 119</p> <p>MAP 117, PARCEL 120</p> <p>MAP 118, PARCEL 121</p> <p>MAP 119, PARCEL 122</p> <p>MAP 120, PARCEL 123</p> <p>MAP 121, PARCEL 124</p> <p>MAP 122, PARCEL 125</p> <p>MAP 123, PARCEL 126</p> <p>MAP 124, PARCEL 127</p> <p>MAP 125, PARCEL 128</p> <p>MAP 126, PARCEL 129</p> <p>MAP 127, PARCEL 130</p> <p>MAP 128, PARCEL 131</p> <p>MAP 129, PARCEL 132</p> <p>MAP 130, PARCEL 133</p> <p>MAP 131, PARCEL 134</p> <p>MAP 132, PARCEL 135</p> <p>MAP 133, PARCEL 136</p> <p>MAP 134, PARCEL 137</p> <p>MAP 135, PARCEL 138</p> <p>MAP 136, PARCEL 139</p> <p>MAP 137, PARCEL 140</p>	<p>STATION 10+10-175 TO 10+428 (SEE NWP-03 AND WWP-04 FOR SPECIFIC MAP LOCATIONS)</p>	<p>RETAINING WALL, SECURITY FENCE, AND RETAINING WALL SUBSURFACE DRAINAGE</p>	<p>OWNERSHIP BY INDIVIDUAL PROPERTY OWNERS AND PRIVATE INSTITUTIONS, PERMANENT EASEMENTS FOR CONSTRUCTION AND SECURITY FENCE.</p> <p>NVC AGREES TO ACCEPT THESE P.E. RIGHTS AT PROJECT COMPLETION OR AS DETERMINED BY NVCBOT.</p>	<p>NVCBOT (DESIGNER) SHALL BE RESPONSIBLE FOR PLANNING, GRADING, AND CONSTRUCTION OF THE PARK SIDE</p> <p>FOR MODULAR: NVCBOT SHALL NVCBOT SHALL PROJECT COMPLETION AND INSPECTION COSTS ASSOCIATED WITH THE PROJECT BUDGET, INCLUDING PRIVATE PROPE FOR ALL WANTS THE SECURITY FENCE, PERMANENT EASEMENTS, AND OWNERS FROM FENCE. INCLUDE PERMANENT SITE EASEMENTS ALL WALL OR FENCE WITHIN THE PROPERTY OWN</p>
6	<p>WCD-SKUNK RIVER AVE. PARK ENTRANCE</p>	<p>STATION 810+009 TO 810+217</p>	<p>SIDEWALK</p>	<p>NVC AS CITY STREET.</p>	<p>NVCBOT (DESIGNER) SHALL BE RESPONSIBLE FOR PLANNING, GRADING, AND CONSTRUCTION OF THE PARK SIDE</p> <p>FOR MODULAR: NVCBOT SHALL NVCBOT SHALL PROJECT COMPLETION AND INSPECTION COSTS ASSOCIATED WITH THE PROJECT BUDGET, INCLUDING PRIVATE PROPE FOR ALL WANTS THE SECURITY FENCE, PERMANENT EASEMENTS, AND OWNERS FROM FENCE. INCLUDE PERMANENT SITE EASEMENTS ALL WALL OR FENCE WITHIN THE PROPERTY OWN</p>
7	<p>MAP 107, PARCEL 107</p> <p>MAP 107, PARCEL 108</p> <p>MAP 108, PARCEL 109</p> <p>MAP 108, PARCEL 110</p> <p>MAP 108, PARCEL 111</p>	<p>STATION 410+217 TO 410+313</p> <p>STATION 410+313 TO 410+428</p> <p>STATION 410+428 TO 410+482</p> <p>STATION 410+482 TO 410+578</p> <p>(ABOVE AVE NARROW PERMANENT EASEMENTS ALONG ADJUTANT FOR CONE INJECTION AND FENCE INDEFINITELY)</p>	<p>RETAINING WALL, SECURITY FENCE, AND RETAINING WALL SUBSURFACE DRAINAGE.</p>	<p>OWNERSHIP BY AUTOLOCK, PERMANENT EASEMENT (P.E.) GRANTED BY NVCBOT FOR MAINTENANCE OF A PERPETUITY.</p> <p>NVC AGREES TO ACCEPT THESE P.E. RIGHTS AT PROJECT COMPLETION OR AS DETERMINED BY NVCBOT.</p>	<p>NVCBOT (DESIGNER) SHALL BE RESPONSIBLE FOR PLANNING, GRADING, AND CONSTRUCTION OF THE PARK SIDE</p> <p>FOR MODULAR: NVCBOT SHALL NVCBOT SHALL PROJECT COMPLETION AND INSPECTION COSTS ASSOCIATED WITH THE PROJECT BUDGET, INCLUDING PRIVATE PROPE FOR ALL WANTS THE SECURITY FENCE, PERMANENT EASEMENTS, AND OWNERS FROM FENCE. INCLUDE PERMANENT SITE EASEMENTS ALL WALL OR FENCE WITHIN THE PROPERTY OWN</p>
8	<p>PATH SEGMENT AND RAMP ON EAST 172ND STREET RIGHT OF WAY</p>	<p>STATION 010+043 TO 010+360</p>	<p>PATH AND ADJUTANCES, INCLUDING SIDEWALK ADJACENT TO SOUTH SIDE OF RAMP</p>	<p>NVC MAINTAINS OWNERSHIP DURING AND AFTER PROJECT COMPLETION AS CITY STREET.</p>	<p>NVCBOT (DESIGNER) SHALL BE RESPONSIBLE FOR PLANNING, GRADING, AND CONSTRUCTION OF THE PARK SIDE</p> <p>FOR MODULAR: NVCBOT SHALL NVCBOT SHALL PROJECT COMPLETION AND INSPECTION COSTS ASSOCIATED WITH THE PROJECT BUDGET, INCLUDING PRIVATE PROPE FOR ALL WANTS THE SECURITY FENCE, PERMANENT EASEMENTS, AND OWNERS FROM FENCE. INCLUDE PERMANENT SITE EASEMENTS ALL WALL OR FENCE WITHIN THE PROPERTY OWN</p>

Exhibit 4 - Maintenance & Jurisdiction Plan S. Bronx Greenway

9	B.N. 224120	STATION D10+60 TO D10+69	BRIDGE AND ALL ASSOCIATED COMPONENTS.	MAINTENANCE ARE WITHIN PART NUMBERS 7 AND 10. MAINTENANCE IS WITHIN NYCDOT P.E. NYCDOT AGREES TO ACCEPT OWNERSHIP RESPONSIBILITY FOR B.N. 226900 ONCE CONSTRUCTION IS COMPLETED. MAINTENANCE OCCUR FOR PART NUMBER 7 P.E. COVERS ADJACENT ENDS NOT DIRECTLY UNDER THE SUPERSTRUCTURE. NYCTA RETAINS OWNERSHIP RIGHTS TO THE GROUND AND ALL INFRASTRUCTURE BETWEEN THE BRIDGE ADJUTMENTS.	NYCDOT IS RESPONSIBLE FOR ALL PAY TO GO MAINTENANCE AND CLEANING, INCLUDING REPAIR OF GARAGE AND SNOW.
10	STRAIGHT PARK ON THE EAST AND WEST SIDES OF THE PARKING BLOCK 2019, LOT 100.	STATION A10+230 TO D10+280	DOG RUN, FLOATING DOCK, PARKING FACILITIES, ARTIFICIAL TURF FIELD, SPRAY SHOWER, PLAY APPURTENANCES, AND OTHER PARK APPURTENANCES.	NYCDOT PARALLEL FOR PROPERTY RIGHTS AND NYCDOT FOR DAMAGE INFRASTRUCTURE.	NYCDOT SHALL PERFORM ALL CAPITAL WORK, INCLUDING STRUCTURAL WORK AND INSPECT WORK AFTER CONSTRUCTION. ALL COSTS ASSOCIATED WITH SUCH WORK WILL BE FULLY REIMBURSED FROM PARKS CAPITAL OR OTHER BUDGET, INCLUDING STAFF AND EQUIPMENT. NYCTA IS RESPONSIBLE FOR THE TRAVEL AND OTHER PARALLEL INFRASTRUCTURE BETWEEN BRIDGE ADJUTMENTS.
11	1885 DRAINAGE INFRASTRUCTURE		PIPES, STORMWATER TREATMENT DEVICE, OUTFALL AND OUTFALL EROSION PROTECTION, AND ALL ASSOCIATED COMPONENTS.	NYCDOT FOR DAMAGE INFRASTRUCTURE.	NYCDOT SHALL BE ALLOWED ACCESS TO THE INFRASTRUCTURE FOR MAINTENANCE AND CLEANING, INCLUDING REPAIR OF GARAGE AND SNOW.
12	SW 2269410	STATION E10+06 TO E10+03	BRIDGE AND ALL ASSOCIATED COMPONENTS.	NYCDOT FOR DAMAGE INFRASTRUCTURE.	NYCDOT SHALL BE ALLOWED ACCESS TO THE INFRASTRUCTURE FOR MAINTENANCE AND CLEANING, INCLUDING REPAIR OF GARAGE AND SNOW.
13	EDGEWATER ROAD PAVEMENT	STATION 5810+00 TO 5810+05	PAYMENT, SIGNING, AND STRIPING.	NYCDOT CITY STREET.	NYCDOT SHALL BE ALLOWED ACCESS TO THE INFRASTRUCTURE FOR MAINTENANCE AND CLEANING, INCLUDING REPAIR OF GARAGE AND SNOW.
14	EDGEWATER ROAD TRAFFIC ISLANDS	STATION 5810+05 TO 5810+050	PLANTING WITHIN THE CURB DEFINING THE TRAFFIC ISLANDS.	NYCDOT CITY STREET.	NYCDOT SHALL BE ALLOWED ACCESS TO THE INFRASTRUCTURE FOR MAINTENANCE AND CLEANING, INCLUDING REPAIR OF GARAGE AND SNOW.
15	PARCEL, SOUTH OF EAST 17TH STREET - BLOCK 3019, LOT 114	STATION D10+557 TO D10+723	ALL INFRASTRUCTURE AND NATURAL RESOURCES.	NYCDOT UNDER THE JURISDICTION OF NYCTA. NYCDOT AGREES TO ACCEPT JURISDICTION AS DETERMINED BY NYCTA.	NYCDOT SHALL BE ALLOWED ACCESS TO THE INFRASTRUCTURE FOR MAINTENANCE AND CLEANING, INCLUDING REPAIR OF GARAGE AND SNOW.
16	PARCEL, UNDER EAST 17TH STREET BRIDGE (B.N. 2066720)	STATION D10+557 TO D10+580	ALL INFRASTRUCTURE AND NATURAL RESOURCES. NYCDOT AGREES TO ACCEPT JURISDICTION AS DETERMINED BY NYCTA.	NYCDOT UNDER THE JURISDICTION OF NYCTA. NYCDOT AGREES TO ACCEPT JURISDICTION AS DETERMINED BY NYCTA.	NYCDOT SHALL BE ALLOWED ACCESS TO THE INFRASTRUCTURE FOR MAINTENANCE AND CLEANING, INCLUDING REPAIR OF GARAGE AND SNOW.
17	PARCEL, BETWEEN EAST 17TH STREET AND THE SOUTH END OF THE WEST PARKS BUS DEPOT	STATION D10+741 TO D10+910	ALL INFRASTRUCTURE AND NATURAL RESOURCES.	NYCDOT OWNERSHIP UNTIL PROJECT COMPLETION ON WHEN DETERMINED BY NYCDOT.	NYCDOT SHALL BE ALLOWED ACCESS TO THE INFRASTRUCTURE FOR MAINTENANCE AND CLEANING, INCLUDING REPAIR OF GARAGE AND SNOW.

18	PARCEL, BETWEEN EAST 17TH STREET AND THE SOUTH END OF WEST PARKS BUS DEPOT	STATION D10+751 TO D10+831	ALL INFRASTRUCTURE AND NATURAL RESOURCES. EXCEPT THE BUS DEPOT BOUNDARY WALL AND FENCE.	NYCDOT UNDER THE JURISDICTION OF NYCTA. NYCDOT AGREES TO ACCEPT JURISDICTION AS DETERMINED BY NYCTA. NYCDOT AGREES TO ACCEPT JURISDICTION AS DETERMINED BY NYCTA. NYCDOT AGREES TO ACCEPT JURISDICTION AS DETERMINED BY NYCTA.	NYCDOT SHALL BE ALLOWED ACCESS TO THE INFRASTRUCTURE FOR MAINTENANCE AND CLEANING, INCLUDING REPAIR OF GARAGE AND SNOW.
19	PARCEL, BETWEEN EAST 17TH STREET AND THE SOUTH END OF WEST PARKS BUS DEPOT	STATION D10+746 TO D10+854	ALL INFRASTRUCTURE AND NATURAL RESOURCES. EXCEPT THE BUS DEPOT BOUNDARY WALL AND FENCE. MAINTENANCE INCLUDES THE SECURITY FENCE ALONG THE ADJUTMENTS.	NYCTA. NYCDOT AGREES TO ACCEPT JURISDICTION AS DETERMINED BY NYCTA. NYCDOT AGREES TO ACCEPT JURISDICTION AS DETERMINED BY NYCTA.	NYCDOT SHALL BE ALLOWED ACCESS TO THE INFRASTRUCTURE FOR MAINTENANCE AND CLEANING, INCLUDING REPAIR OF GARAGE AND SNOW.
20	B.N. 2261480	STATION E10+473 TO E10+513	BRIDGE AND ALL ASSOCIATED COMPONENTS.	NYCDOT PARALLEL FOR PROPERTY RIGHTS AND NYCDOT FOR DAMAGE INFRASTRUCTURE.	NYCDOT SHALL BE ALLOWED ACCESS TO THE INFRASTRUCTURE FOR MAINTENANCE AND CLEANING, INCLUDING REPAIR OF GARAGE AND SNOW.
21	PARCELS BETWEEN SOUTH END OF WEST PARKS BUS DEPOT PARKING AND 1885 BROOK RIVER	STATION D10+880 TO D11+230	ALL INFRASTRUCTURE AND NATURAL RESOURCES.	NYCDOT.	NYCDOT SHALL BE ALLOWED ACCESS TO THE INFRASTRUCTURE FOR MAINTENANCE AND CLEANING, INCLUDING REPAIR OF GARAGE AND SNOW.
22	AREA BETWEEN 1885 PARKING AND THE BROOK RIVER	STATION D10+900 TO D11+200	LANDSCAPING AND MOWING.	NYCDOT.	NYCDOT SHALL BE ALLOWED ACCESS TO THE INFRASTRUCTURE FOR MAINTENANCE AND CLEANING, INCLUDING REPAIR OF GARAGE AND SNOW.
23	AREA UNDER 185 AND NORTHBOUND 185 RAMP TO SOUTHBOUND 185	STATION D11+016 TO D11+180	ALL INFRASTRUCTURE AND NATURAL RESOURCES. LESS INFRASTRUCTURE DIRECTLY RELATED TO THE 185 BRIDGE AND THE NORTHBOUND 185 RAMP BRIDGE TO SOUTHBOUND 185.	NYCDOT.	NYCDOT SHALL BE ALLOWED ACCESS TO THE INFRASTRUCTURE FOR MAINTENANCE AND CLEANING, INCLUDING REPAIR OF GARAGE AND SNOW.
24	AREA DELIMITED BY 1855 NORTH OF PROJECT LIMITS TO THE SOUTH, EAST 17TH STREET TO THE EAST, THE BROOK RIVER TO THE WEST, AND EAST DRAINAGE FOR 1895 WITHIN PART 10	E10+100 TO E10+200	ALL INFRASTRUCTURE AND NATURAL RESOURCES. LESS THE COMBINED SEWER OUTFALL AT THE SOUTH END OF THIS AREA.	NYCDOT.	NYCDOT SHALL BE ALLOWED ACCESS TO THE INFRASTRUCTURE FOR MAINTENANCE AND CLEANING, INCLUDING REPAIR OF GARAGE AND SNOW.
25	DRAINAGE FOR 1895 WITHIN PART 10	E10+100 TO E10+200	DRAINAGE PIPES, STORM WATER TREATMENT DEVICE, MANHOLES, AND BACKFLOW PREVENTORS.	NYCDOT PROPERTY WITH NYCDOT OWNERSHIP OF DRAINAGE INFRASTRUCTURE.	NYCDOT SHALL BE ALLOWED ACCESS TO THE INFRASTRUCTURE FOR MAINTENANCE AND CLEANING, INCLUDING REPAIR OF GARAGE AND SNOW.

Exhibit 5 - Mechanical Broom & Snow Plowing



Sentinel Model Specifications

POWER SWEEPER

Feature		
Sweeping System		
Cleaning path		
Main brush	51-inch	1,295 mm
With right side brush	69-inch	1,750 mm
With opt. dual side brushes	87-inch	2,210 mm
With opt. dual side brushes & Vario Sweeping Brush™	126-inch	3,200 mm
Main brush		
Main brush length	51-inch	1,295 mm
Main brush diameter	24-inch	610 mm
Vario Sweeping Brush™		
Diameter	38-inch	965 mm
Debris hopper		
Volume capacity	3.4 yd³	2.6 m³
Weight capacity-low dump	7,000 lb	3,175 kg
-high dump	4,000 lb	1,815 kg
Dump height-low dump	40-inch	1,016 mm
-high dump	114-inch	2,895 mm
Dust Control System		
Filter system	Dry-filtering	Dry-filtering
Type	Mildew-resistant,	Mildew-resistant,
Area	synthetic envelope	synthetic envelope
	221 ft²	20 m² panel filter
Vacuum fan (2) Motor	15 hp each	10 kW each
Propelling System		
Engine, turbo diesel	Caterpillar 99 hp	Caterpillar 74 kW
Gradeability		
Full hopper	8.0 deg	8.0 deg
Empty hopper	12.0 deg	12.0 deg
Machine Dimensions		
Length-standard machine	175-inch	4,445 mm
With Vario Sweeping Brush™	206-inch	5,230 mm
Width	70-inch	1,780 mm
Height	100-inch	2,540 mm
Weight-net base machine	12,500 lb	5,670 kg
Turning radius	156-inch	3,960 mm
Warranty	Please refer to your local Tennant representative for information.	



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