Staten Island
South & West Shore
Greenways Master Plan

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Introduction

Project Description

The South and West Shores of Staten Island are home to some of the city's most dramatic waterfront views, best preserved forests and wetlands, and unique historical sites. There is currently no continuous system of bicycle and pedestrian pathways to take advantage of the open space along the south shore waterfront. Cyclists and hikers wanting to explore the Raritan Bay waterfront are confined to discontinuous park paths, esplanades along recently-completed residential communities, and an irregular pattern of mapped but unbuilt streets.

The goal of the South and West Shore Greenways Project is to provide a public amenity that will serve non-motorized commuting and recreational needs, improve waterfront access, connect natural and cultural resources, link communities to each other, to employment centers and commercial districts, and improve the quality of life for local residents.

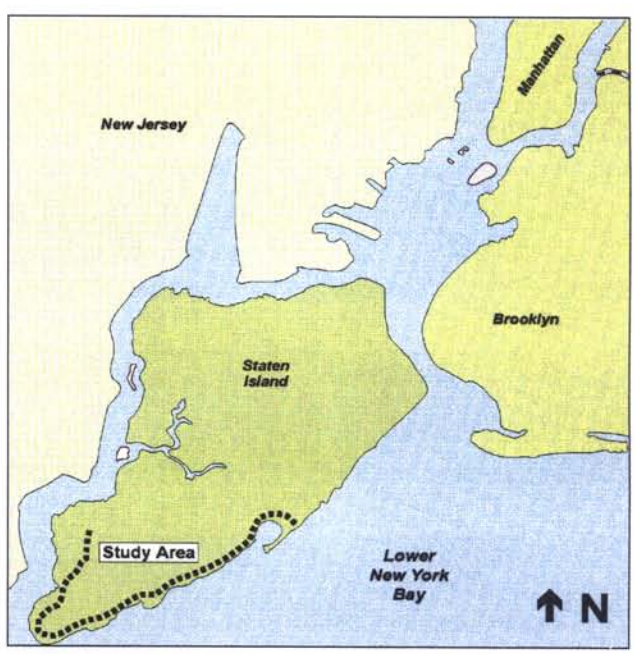
The proposed route of approximately 17 miles extends from Great Kills Park to Conference House Park along Staten Island's south shore, then continues along the southern portion of the Arthur Kill to connect with Clay Pit Pond and Bloomingdale parks.

Funded by the Transportation Enhancement Program of the Intermodal Surface Transportation Efficiency Act (ISTEA), the Department of City Planning (DCP) has planned and designed the South and West Shore Greenways in consultation with an advisory committee. The committee was composed of Community Board 3, civic organizations and community groups, as well as federal, state and local agencies. Numerous field visits, advisory committee meetings, and valued community input helped shape the outcome of this study.

This master plan includes a detailed description of the proposed route, presents schematic designs for each segment, defines guidelines for trail and bike lane design, and recommends improvements or alterations to existing facilities and landscaping. It also includes construction cost estimates and identifies potential implementors.

The proposed greenway capitalizes on the South Shore open space resources as defined in the Special South Richmond Development District, and within the constraints of jurisdictional issues [the private ownership of portions of Designated Open Space (DOS)] and environmental issues (freshwater, tidal wetlands and woodlands are designated throughout much of the open space).

This master plan should serve as a resource and guide for city, state and federal agencies, community groups and private developers to implement the plan. Private developers are encouraged to include greenway route recommendations - a separated multi-use path - in their projects. Agencies involved in capital construction projects in the South and West Shores are also in an excellent position to construct the greenway in conjunction with their ongoing work efforts.



General Study Area

Planning Framework

New York City Greenway System:

This proposed greenway is part of an ambitious effort to develop a comprehensive network of cycling lanes and greenways throughout the city. The 1997 *New York City Bicycle Master Plan* identified a 550-mile citywide on-street bicycle network and a 350-mile network of primarily off-street bicycle and pedestrian paths, as identified in the 1993 *Greenway Plan for New York City*, to be constructed in the coming years.

A greenway is a multi-use pathway for non-motorized transportation along linear spaces like park paths, waterfront esplanades, river corridors, shorelines, railroad rights-of-way, or city streets. These linear spaces can be natural or constructed landscaped paths for bicyclists and pedestrians. Greenways serve as open space connectors, linking origins and destinations such as parks, nature reserves, cultural areas, historic sites, employment centers, commercial areas, libraries, or schools. Greenways are used for walking, jogging, in-line skating, bicycling, and by wheelchair users.

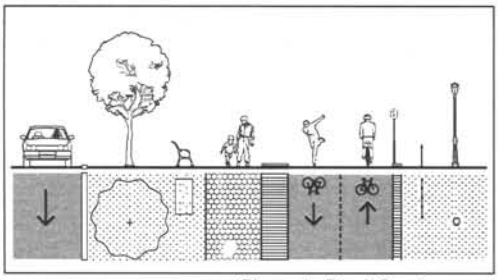
A successful greenway offers easy accessibility, connects to existing facilities in the bicycle/greenway network, is direct, continuous and provides a safe environment for its users.

Source: *A Greenway Plan for New York City*, DCP, 1993

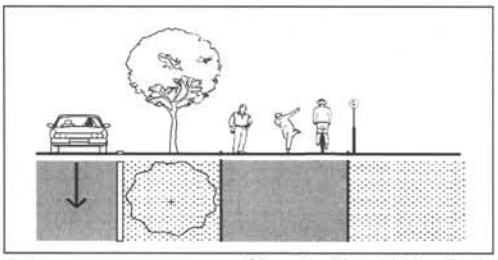
Greenways in New York are classified by type:

- Class 1: Multi-Use Trail

  A multi-use trail is separated from the roadway and delineated by pavement markings and regulatory signage.



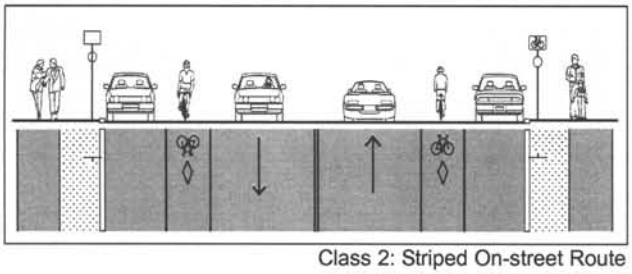
Class 1: Dual Carriageway



Class 1: Shared-Use Path

- Class 2: Bicycle Lane

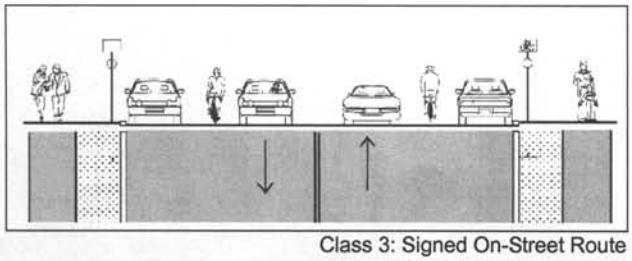
  A bicycle lane is part of the roadway and delineated by pavement markings and regulatory signage.



Class 2: Striped On-street Route

- Class 3: Signed Route

  A signed route or bike route has informational signage only, typically located at each block along the route.



Class 3: Signed On-Street Route

See Appendix A for more details about the greenway classification system.

Waterfront Planning in Staten Island:

The long-term goal of a continuous waterfront route along Staten Island's South Shore in particular is part of a larger vision articulated in the New York City Zoning Resolution. In 1975, the Special South Richmond Development District (SSRDD), encompassing twenty square miles of Staten Island Community District 3, was created to preserve the rural and natural characteristics of the South Shore in the face of increasing development. To allow access to the waterfront, the SSRDD specifically designated a waterfront esplanade, including the creation of shore public walkways on waterfront zoning lots, along Raritan Bay from Wiman Avenue to Conference House Park.

The same theme is echoed in the *New York City Comprehensive Waterfront Plan: Reclaiming the City's Edge*. Released by the Department of City Planning in 1992, the plan seeks to balance the many uses of the waterfront while promoting recreational use, open space, and public access to the water's edge. For the South Shore, the plan recommends developing waterfront access, improving street-ends with landscaping and promenades, and increasing recreational opportunities.

The South and West Shore Greenways master plan, with its emphasis on bringing greenway users to the waterfront, attempts to carry out the goals of these earlier plans.

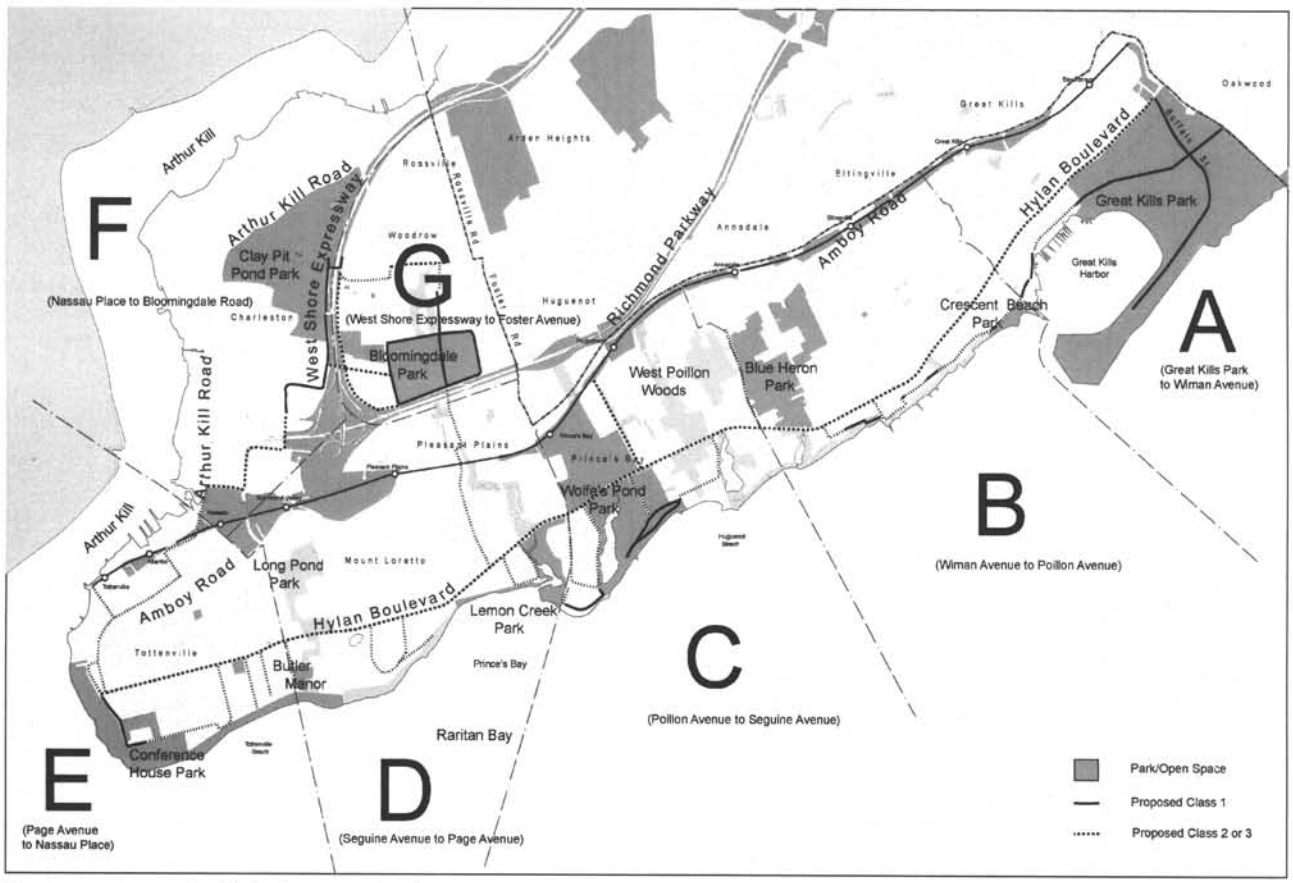
Study Area

The study area has three major sections: the South Shore, the West Shore, and Hylan Boulevard. While the South Shore section focuses on the waterfront, and the West Shore on open spaces, the Hylan Boulevard section offers an alternative east-west on-street route to provide a faster, more direct connection. The Hylan Boulevard alternative might be preferred by bicycle commuters, while the waterfront route might attract mainly recreational users. For reasons of manageability, the entire study area has been divided into seven segments (A through G).

South Shore:
The study area boundaries for this portion are the Staten Island Rapid Transit (SIRT) to the north, Raritan Bay to the south, Buffalo Street to the east, and the Arthur Kill to the west. The South Shore encompasses several city-owned parks, publicly- and privately-owned designated open spaces (DOS) - most of which are natural area preserves - as well as rapidly growing residential communities, including Great Kills, Bay Terrace, Eltingville, Annadale, Prince's Bay, Mount Loretto, and Tottenville. Segments A-E are covered in this portion.

West Shore:
The boundaries for the West Shore section are the SIRT to the south, the Arthur Kill to the west and north, and Rossville Road and Foster Avneue to the east. The Arthur Kill waterfront encompasses Tottenville's waterfront, Mill Weir Creek, the Outerbridge Crossing area, Charleston/Kreischerville and Rossville. The potential for a path system along this section's waterfront is constrained by private ownership and manufacturing uses along the waterfront. Nonetheless, a greenway route would take advantage of views of the Arthur Kill and connect with the hiking and equestrian trails and natural resources found in Clay Pit Ponds and Bloomingdale Parks, the area's two major parks. Segments F and G are described in this section.

Hylan Boulevard:
This section follows the right-of-way of Hylan Boulevard from Buffalo Street at Great Kills Park to its termination at Satterlee Street at Conference House Park.



The seven segments of the Staten Island South and West Shore Greenway

Existing Conditions

Overview

The study area offers a variety of land uses, recreational facilities and waterfront uses, and is subject to a variety of zoning designations. The South Shore is mainly residential, contains several parks, waterfront marinas and institutional facilities; the West Shore waterfront is more commercial and industrial. The study area is dotted by numerous national, state and city parks with a wealth of sandy beaches, streams, ponds, freshwater wetlands, saltwater marshes, and high bluffs. Woods and forested wetlands are located inland. These unique natural features are preserved by several means. In addition to the parkland, open space is protected through parcels of Designated Open Space (DOS) and through Bluebelt property. The DOS parcels, as defined by the New York City Zoning Resolution's Special South Richmond Development District (SSRDD), must be preserved in their natural state or, with City Planning Commission approval, used for limited active recreation facilities. The district plan also designates a waterfront esplanade along certain streets and the waterfront of the south shore. The Bluebelt property, under the jurisdiction of the NYC Department of Environmental Protection, preserves natural drainage corridors by consolidating once-isolated parcels surrounding major watersheds. See Appendix C for more details on the SSRDD.

The Staten Island Rapid Transit (SIRT) connects Tottenville by rail with the St. George Ferry Terminal. Eleven stations lie within the study area and offer access to the South Shore. The other parts of the study area are serviced by local and express buses, which include the 54, 59, 78, 79, X1, X4, X5, X6, X17, X19, and X22 lines.

Segment by Segment

The following section describes the entire study area, segment by segment. The study area map on the previous page shows the segment boundaries.

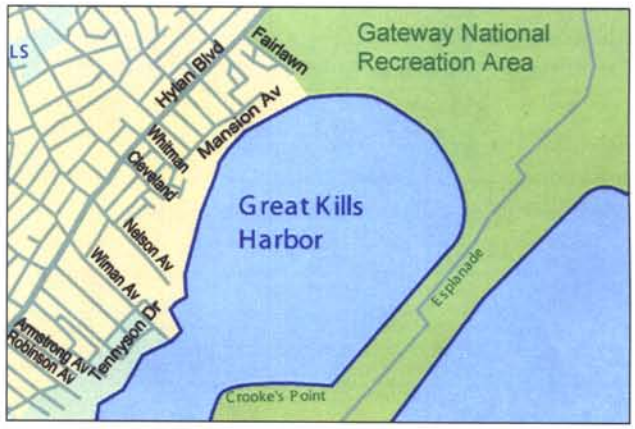
Segment A:

(Great Kills Park to Wiman Avenue)

The Bay Terrace and Great Kills areas are neighborhoods of mainly single-family homes. Some commercial activity is located along Hylan Boulevard. The shoreline contains mainly waterfront-related uses.

Waterfront:

Most of the waterfront is located within Great Kills Park in the Gateway National Recreation Area. The park's southern finger forms Great Kills Harbor, home to Great Kills Yacht Club and Richmond County Yacht Club. To the south of the park maritime uses are located along Mansion Avenue, which runs parallel and adjacent to the waterfront. In addition to the yacht clubs, a marina, boat storage facilities, retail shops and a restaurant line the street. A connection between Mansion Avenue and Great Kills Park is interrupted by the unbuilt portion of the avenue itself and the street's use by the private Great Kills Yacht Club.



Segment A (Great Kills Park to Wiman Avenue)

Between Fairlawn and Whitman avenues, Mansion Avenue is 54 feet wide. At Whitman Avenue it becomes Tennyson Drive and narrows to 43 feet. Tennyson Drive terminates at Cleveland Avenue, even though it is mapped to connect with Wiman Avenue.

With the exception of the Port Regalle residential development with its private esplanade, the waterfront between Cleveland and Wiman Avenues is undeveloped. Between Cleveland and Nelson avenues lies a private lot and the proposed Seaside Nature Park (NYCDPR). Immediately south of Nelson Avenue is Lot 70, under Parks jurisdiction, where a new open space has been created in conjunction with the community. Part of the right-of-way of the unbuilt Tennyson Drive traverses Lot 70. A new residential development, Sweetwater Estates, is proposed to be built west of Tennyson Drive, between Cleveland and Wiman avenues.

Parks and Recreation:
Great Kills Park is under the jurisdiction of the National Park Service. It covers 825 acres, and the park offers several paths, an esplanade, a boat launch, a model airplane flying field, a 400-yard bathing beach and a comfort station. A new educational center was opened in 2000 and new landscaping was provided. At the southern tip of the park is Crooke's Point. Originally an island, Crooke's Point became a peninsula in the 1940s through dredging and landfill. The point supports 81 species of birds and small mammals.

Hylan Boulevard:
In this segment, Hylan Boulevard is a heavily trafficked four-lane east-west arterial, measuring 70 feet, with a narrow concrete center median of approximately six feet. In each direction there are two 10-foot travel lanes and an unmarked 12-foot curb lane. Weekdays, the northbound curb lane is a moving lane from 6 to 9 a.m.; the southbound curb lane is a moving lane from 4 to 7 p.m. At Nelson Avenue commercial activity increases and two-hour parallel parking begins.

Transit:
The Bay Terrace and Great Kills SIRT stations offer rail access to the area. In addition, several express and local bus stops are along Hylan Boulevard.

Segment B:
(Wiman Avenue to Poillon Avenue)

The study corridor continues to the south through the predominantly residential neighborhoods of Eltingville and Annadale.

Waterfront:
Wiman Avenue to Arden Avenue:
The Tennyson Drive right-of-way continues to parallel the waterfront from Wiman to Retford avenues. The SSRDD designates a waterfront esplanade along Tennyson Drive, which is unbuilt between Armstrong and Robinson avenues. A 3.6 acre, city-owned waterfront DOS site encompassing the demapped Preston Avenue is located on Tennyson Drive between Richmond and Hales avenues. The drive is unbuilt through a portion of the DOS.

Segment B (Wiman Avenue to Arden Avenue)

To the west of the DOS site, Wakefield Road, the continuation of Tennyson Drive, parallels the waterfront between Hales Avenue and Woods-of-Arden Road. Large single-family homes are located on both sides of the road, separating the street from the bay. An asphalt path connects Wakefield Road to Mayberry Promenade in Atlantic Village, a recently completed waterfront residential development to the west between Woods-of-Arden Road and Arden Avenue. A three-foot wide public waterfront esplanade is located adjacent to 43-foot Mayberry Promenade, paralleling the waterfront within the Atlantic Village subdivision and built as part of the esplanade delineated in the SSRDD.

Arden Avenue to Poillon Avenue:
The area west of Atlantic Village is composed of detached single-family homes. Ocean Driveway, a designated waterfront esplanade street designated in the SSRDD, has a 19-foot, one-way westbound road and a separated grass path within its right-of-way. The street connects with Mayberry Promenade and Harold Avenue. City-owned waterfront DOS property is located along Ocean Driveway, providing commanding views of the bay. (Ocean Driveway is mapped but does not exist west of Harold Avenue, where shoreline erosion has eliminated the street.) Harold Avenue connects Ocean Driveway with Hylan Boulevard. Two blocks west, Bennet Avenue provides access from Hylan Boulevard back to the waterfront at the 35-foot wide Bayview Terrace, which runs adjacent to the waterfront from Bennet Avenue to Barclay Avenue. Several single-family houses are located between Bayview Terrace and the waterfront. The block between Bennet and Holdridge avenues is unbuilt, preventing continuous waterfront access. Oceanview Avenue runs parallel to the waterfront from Holdridge to Lipsett Avenue. However, it lies one block off the shoreline with homes on both sides of the street, and does not provide a view of the bay.

Segment B (Arden Avenue to Poillon Avenue)

South of Hylan Boulevard and west of Lipsett Avenue is Seguine Pond, a city-owned DOS freshwater wetland with no provisions for waterfront access. West of Seguine Pond is Spanish Camp, a former bungalow community. The area is slated for redevelopment and offers about 1,000 linear feet of beach front without formal access.

Parks and Recreation:
The two major parks in this segment are Crescent Beach Park and Blue Heron Park. Crescent Beach Park is located across from Crooke's Point in Great Kills Park. Its sandy beach offers great views of the Raritan Bay and is being expanded south to Richmond Avenue.

Blue Heron Park is located north of Hylan Boulevard between Harold and Poillon avenues. In the 1930s, New York City acquired 147 acres of land to create this park, which supports animal species like crayfish, frogs, herons, osprey, and spotted turtles. The natural landscape includes a variety of plant species, grassy fields, and forests interspersed with streams. The Bunkers Pond area along the waterfront, connecting Arbutus Creek and Wolfe's Pond Park, is Designated Open Space (DOS). Improvements to the park are currently underway to construct an environmental center, rehabilitate paths, and provide additional landscaping.

Hylan Boulevard:
Hylan Boulevard remains a heavily-trafficked east-west arterial. From Wiman to Arden avenues it remains 70 feet wide with a narrow concrete median and three lanes in each direction. At Arden Avenue Hylan Boulevard's geometry changes: the concrete median is replaced by a 10-foot striped median with left-turn bays. There are no sidewalks on Hylan Boulevard where the street fronts parklands.

There is commercial activity along the street with two-hour parallel parking. At Richmond Avenue mainly residential uses start to line the boulevard.

Transit:
SIRT stations for this segment are the Eltingville Station located at Richmond Avenue and White Court, and the Annadale Station at Jefferson Boulevard and Downes Avenue. Several bus stops are located along Hylan Boulevard.

Segment C:

(Poillon Avenue to Seguine Avenue)

The proposed Greenway corridor proceeds southwest through Annadale and Prince's Bay, residential neighborhoods of detached single-family houses. The area, with its mixture of turn-of-the-century and new homes, is still rural in character with mapped, partially-built streets. Two schools, St. Joseph's High School and Elias Berstein Intermediate School, are located south of Hylan Boulevard. Tottenville High School is north of Hylan Boulevard, along Luten Avenue. The Prince's Bay neighborhood, located west of Wolfe's Pond Park and south of Hylan Boulevard, also contains medical facilities and the Staten Island Hospital.

Waterfront:

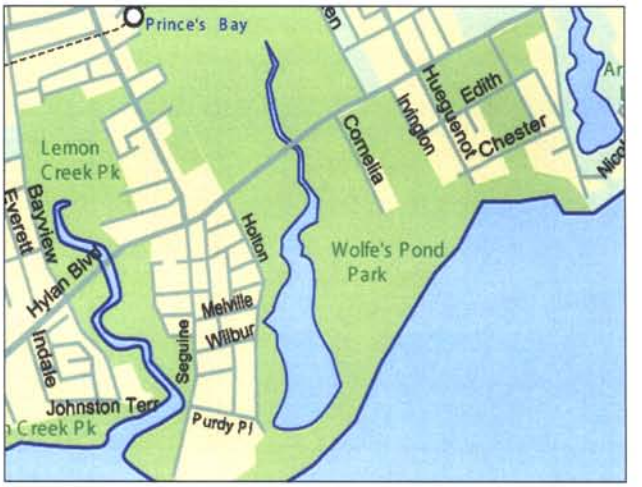
Poillon Avenue to Huguenot Avenue:

Zephyr Avenue is the 23-foot waterfront roadway in this area, running between Poillon and Bertram avenues. Zephyr Avenue is interrupted to the west by a fence bordering the Ocean Gate Estates residential development, preventing a connection to Nicolosi Drive. Arbutus Lake, located north of Ocean Gate Estates, is designated as part of DEP's Bluebelt project. The property surrounding the lake is privately-owned DOS, maintained by the Ocean Gate Estates homeowners association. West of Ocean Gate Estates, Chester Avenue runs along the waterfront between Arbutus Avenue and Huguenot Avenue. Another waterfront DOS site borders Chester Avenue.

Segment C (Poillon Avenue to Hugenot Avenue)

Huguenot Avenue to Seguine Avenue:

Located north and south of Hylan Boulevard between Luten and Holton avenues is Wolfe's Pond Park. Pedestrian access exists along the park's waterfront east of the pond.



Segment C (Huguenot Avenue to Seguine Avenue)

Holton Avenue, a 20-foot wide, north-south street, runs adjacent to Wolfe's Pond Park, and terminates at Purdy Place. Purdy Place is 23 feet wide, runs parallel to the waterfront, and is in poor condition due to sewage and drainage problems from the adjacent residences and Lemon Creek. The waterfront property at Prince's Point, also known as Seguine Point, has undergone contamination mitigation in preparation for the 266-unit Prince's Point residential development. The site is the location of the former S.S. White Dental Works factory. The development will include an unimproved pedestrian esplanade (beachfront easement), linking Wolfe's Pond Park and Lemon Creek Park. Johnston Terrace, east of Lemon Creek, was demapped for this development and to expand Lemon Creek Park. Seguine Avenue, at 25 feet wide, is a north-south arterial, with significant traffic generated by Staten Island Hospital.

Parks and Recreation:

The 341-acre Wolfe's Pond Park is located north and south of Hylan Boulevard, and includes natural environments such as beachfront, freshwater ponds and marshes, a dense upland forest, and designated wetlands. The park provides passive recreation activities, including a bathing beach, nature trails, picnic areas, a playground and boathouse, and com-

fort stations. Other recreational spaces within this segment are the Arbutus Lake Bluebelt property and the portion of Blue Heron Park to the west of Poillon Avenue.

Hylan Boulevard:
Hylan Boulevard remains a 70-foot wide, four lane east-west arterial with a 10-foot striped median with dedicated turning lanes. It is quite heavily traveled until Huguenot Avenue, where it becomes less trafficked but vehicular speeds are higher due to infrequent traffic lights. Huguenot Avenue is one of the main north-south connectors in the segment. It is 30 feet wide and provides access to one of the SIRT stations in the area. Tottenville High School is located north of Hylan Boulevard on Luten Avenue, a two-lane, 50-foot wide street.

Transit:
SIRT stations are located at Huguenot Avenue, just north of Amboy Road, and at Seguine Avenue and Herbert Street. Bus service is provided along Hylan Boulevard, as well as along Seguine and Luten avenues.

Segment D:
(Seguine Avenue to Page Avenue)

The proposed Greenway corridor continues through Pleasant Plains and Mount Loretto, residential neighborhoods with a distinctly rural character.

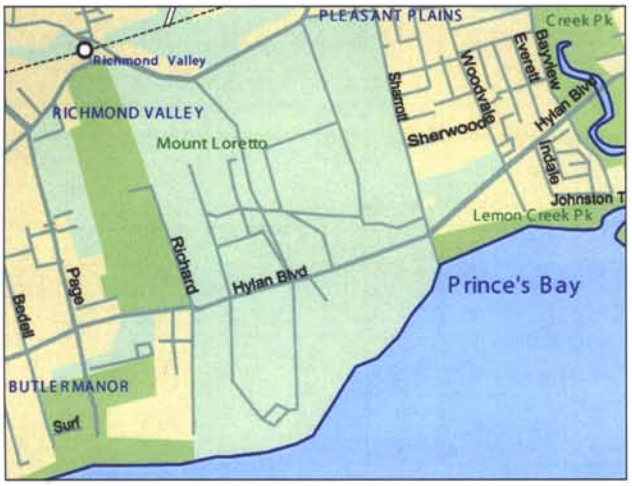
Waterfront:
While small residential neighborhoods are located in the eastern and western portion of the segment, the majority of the waterfront is designated park or open space.

Segment D (Seguine Avenue to Sharrott Avenue)

Lemon Creek, just west of Seguine Avenue, runs north-south through the park from Prince's Bay. Near the mouth of the creek, maritime activities include wet and dry boat storage, dock repair facilities, and a private boat launch. A vehicular bridge over Lemon Creek was recently removed. Johnston Terrace is the only street that parallels the waterfront just west of Lemon Creek Park. It is designated as a waterfront esplanade within the special zoning district. Captain's Quarters, located on Johnston Terrace between Bayview and Indale avenues, is a 272-unit residential complex of attached townhouses with 38-foot wide roads and a seven-acre park along the waterfront.

The Greenway corridor continues west through the Mount Loretto neighborhood and property, located north and south of Hylan Boulevard. The Mt. Loretto property north of Hylan Boulevard is owned by the Catholic Archdiocese and houses a variety of reli-

gious, charitable, recreational and community facilities on 294 acres. The state agreed to purchase the 145-acre portion south of Hylan Boulevard to the Raritan Bay as a natural preserve. The portion bordering the waterfront is identified as Designated Open Space. The tidal wetlands along Raritan Bay nourish the largest clam beds in the state.



Segment D (Sharrott Avenue to Page Avenue)

Butler Manor, located west of Mount Loretto between Richard and Page avenues, has a rural character, with significant wetlands and both public and private DOS parcels. Severe erosion has eliminated substantial portions of the DOS waterfront. A horse stable is located at Butler Boulevard and Flower Avenue. Located south of Hylan Boulevard, between Butler Boulevard and Page Avenue, is the South Shore Swim Club, which includes tennis courts, playgrounds and a picnic area.

Parks and Recreation:
Parks and open space are the dominant land uses in this segment. The 106-acre Lemon Creek Park is located in Prince's Bay west of Seguine Avenue, and continues approximately one mile along the shore. This area contains the remains of a small fishing village that closed in 1937 due to a typhoid outbreak. The park was acquired in 1964 and the last parcel was added in 1989.

The park was recently designated a Significant Coastal Fish and Wildlife Habitat by the New York State Department of State. Its creek is the only tidal/freshwater marsh on the island. The creek water comes from Porzio's Pond, a fresh water pond at Woodrow Road, near the western shore of the island. The park is home to the only Purple Martin bird colony in the city.

Seguine Mansion is located at Seguine Avenue and Hank Street. The 18-room Greek Revival structure was built in 1850 as a summer waterfront retreat by Joseph H. Seguine, a prosperous farmer and oyster trader. The historic house was acquired by the New York City Department of Parks and Recreation and is now a museum. The Seguine Equestrian Center currently operates a stable and riding facility on the property.

The Mt. Loretto site, owned by the Mission of the Immaculate Virgin (Catholic Archdiocese), was originally used to aid destitute children from Manhattan. Mt. Loretto's most notable structure was St.Elizabeth's Home for Girls, built in 1897 on top of a meadow overlooking Raritan Bay. The structure was destroyed by fire almost a decade ago.

Hylan Boulevard:
Hylan Boulevard continues west at a width of 70 feet with a 10-foot median and left-turn bays. Sidewalks are unbuilt where Hylan Boulevard traverses parkland or open space. On-street parking is infrequent given the adjacent park land and rural setting.

Transit:
The Richmond Valley and the Pleasant Plains SIRT stations serve this segment. Local and express bus service is located along Hylan Boulevard and Amboy Road.

Segment E:
(Page Avenue to Nassau Place)

The neighborhoods of Tottenville and Tottenville Beach are located at the southwestern tip of Staten Island. They consist of turn-of-the-century and new single-family homes and offer park land along large portions of the waterfront.

Waterfront:
The previously-mentioned DOS property continues from Mt. Loretto to the west to Conference House Park. Surf Avenue is mapped but unbuilt along most of the Butler Manor waterfront between Page Avenue and Brighton Street. The only built portion of Surf Avenue is between Sprague Avenue and Loretto Street, where a sea wall has been constructed to prevent erosion.

Conference House Park is located along the borough's tip, between Brighton Street and Shore Road. It is largely undeveloped and contains historic resources as well as a variety of natural features. The park offers dramatic waterfront views and occupies a substantial portion of the waterfront on the south shore. Shoreline erosion is a major concern. The wetlands were created by a stream, starting at Finlay and Aspinwall streets and ending with a large marsh bordering the beach.

Segment E (southern half)

The waterfront north of Conference House Park is developed with single-family homes on narrow streets. Tottenville's commercial center is located on Main Street between Amboy Road and Arthur Kill Road. The waterfront along the Arthur Kill becomes more industrial and commercial. Marinas, storage facilities, auto repair shops and warehouses make the waterfront inaccessible to the general public. The roads that provide closest access to the waterfront are Ellis Street, a 35-foot wide, lightly-trafficked roadway, and Arthur Kill Road, a two-lane, 34-foot wide major east-west arterial. Craig Avenue is a two-way residential street one block further inland.

Segment E (northern half)

Parks and Recreation:
The 228-acre Conference House Park is rich in natural and historic resources. Half of the park is the site of a Native American burial ground. The park includes the Conference House, built in 1680 from fieldstones and timber, and so-named for a meeting there that attempted to end the Revolutionary War.

The park also contains the Henry Biddle House, a Greek Revival home built in 1850, archaeological ruins, and natural features such as accreting and eroding beach areas, sandy bluffs, meadows, woodlands, and freshwater wetlands. A newly-installed playground is located along Billop Avenue. Billop Avenue, Surf Avenue, and Satterlee Street are all narrow, lightly-trafficked streets that run along the perimeter of the park. A 1989 Master Plan for Conference House Park recommends creating six precincts representing the significance of each area.

Along Hylan Boulevard are other recreational facilities, such as five softball fields for the South Shore Little League.

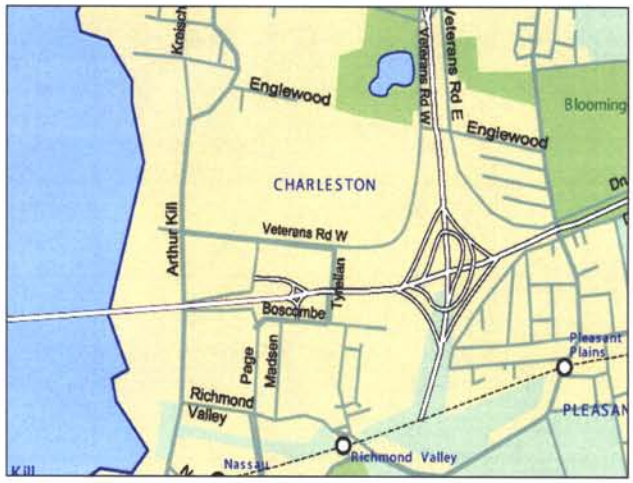
Hylan Boulevard:
Hylan Boulevard narrows to 60 feet and carries less traffic. The street maintains two travel lanes and a parking lane in each direction, but the median is eliminated. It terminates at its intersection with Craig Avenue and Satterlee Street at Conference House Park, in the residential neighborhood of Tottenville. Page, Bedell, and Joline avenues provide access from Hylan Boulevard to the Raritan Bay waterfront where erosion has eradicated mapped parts of Surf Avenue. Page Avenue has two lanes and is 41 feet wide north of and 16 feet wide south of Hylan Boulevard.

Transit:
The Nassau, Atlantic, and Tottenville stations of the SIRT are located in the northern part of the segment. Tottenville station at the end of Bentley Street is the terminus of the SIRT line. Several local and express buses serve Hylan Boulevard, Craig Avenue, Main Street, and Arthur Kill Road.

Segment F:
(Nassau Place to Bloomingdale Road)

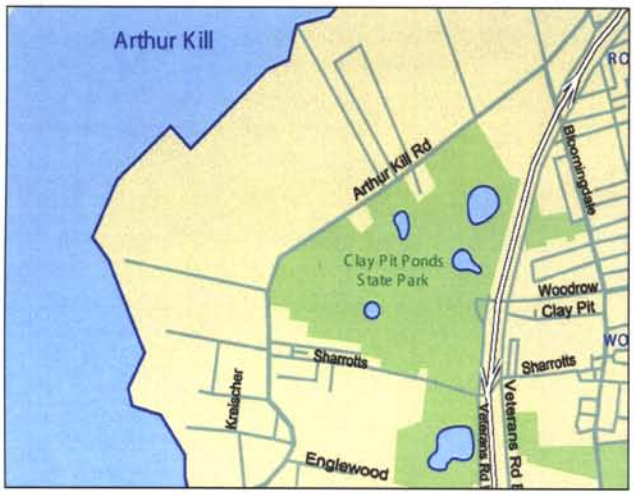
The proposed Greenway corridor continues to the north through the Charleston neighborhood. The land uses are primarily industrial, despite which, the area has remained rural in character, with wetlands along the waterfront, vacant land and wooded and residential neighborhoods inland.

Waterfront/Land Uses:
Arthur Kill Road, a two-lane, 34-foot wide, moderately trafficked arterial with high speeds provides connections to the Outerbridge Crossing, New Jersey and Richmond Parkway. Arthur Kill Road becomes winding and hilly around Englewood Avenue.



Segment F (southern half)

Between Englewood Avenue and Sharrotts Road the land uses remain primarily commercial. Warehouses, recording and television studios, auto body shops, delis, repair and retail shops, and occasional single-family homes characterize the area. North of Arthur Kill Road industrial uses predominate. Mobil's large oil storage facilities are located along the waterfront between Ellis Road and Johnson Street in Port Mobil. Other land uses include the indoor Staten Island Ice Skating Rink, the Richer Farmer's stables on Sharrotts Road near Veterans Road West, the Staten Island Golf Practice Center, and the Arthur Kill Correctional Facility.



Segment F (northern half)

In addition to the mainly commercial uses, there are also several hundred acres of currently vacant land east of Arthur Kill Road. An MTA bus depot is planned on 10 acres fronting Arthur Kill Road at Englewood Avenue. Market rate senior housing is proposed at the privately-owned Kreischer Mansion site. The landmarked mansion would be preserved. The vacant area along Veterans Road West south of Englewood Avenue will be the future home of the Bricktown Centre shopping center, a private retail development. Just north of the site and adjacent to Clay Pits Pond State Park 20 acres of wood- and wetlands will be preserved, providing a buffer between the existing park and the proposed retail center. An additional 22 acres is slated for city parkland. A remaining portion of open space could become the future home of public schools, senior housing, and additional retail/commercial developments.

Parks and Recreation:
The 250-acre Clay Pit Ponds State Park Preserve is one of three wildlife preserves in New York State, and includes 6.5 miles of meandering equestrian and hiking trails. The park is on the site of the former Kreischer Brickworks, a clay mining operation that serviced the construction industry in New York City. The park preserve opened in 1980 and has over 90 acres of designated freshwater wetlands. The Winant Farm, which is eligible for listing in the State and National Registers of Historic Places, is located within the park grounds.

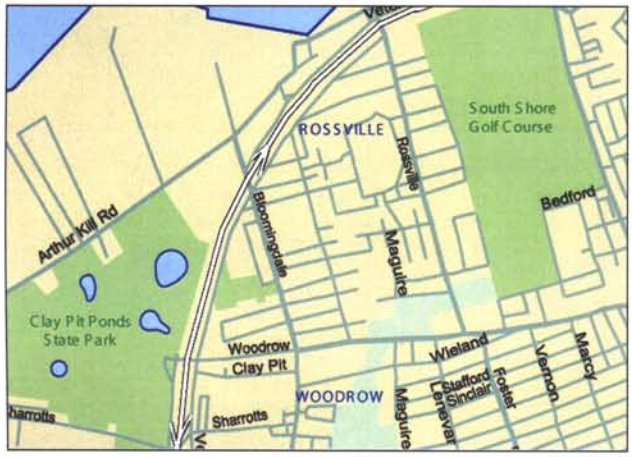
The park is bordered by Arthur Kill Road, Englewood Avenue and the West Shore Expressway. Traversing the park, Sharrotts Road, a 30-foot wide, major east-west arterial, connects Arthur Kill Road to Bloomingdale Road across the expressway.

Transit:
Transit services in this segment are limited to the local bus route 74. The SIRT runs along the southern boundary of the segment as described previously.

Segment G:

(West Shore Expressway to Foster Road)

Segment G contains the neighborhoods of Woodrow and Rossville, areas currently undergoing rapid development of single-family and townhouse subdivisions. Some vacant land and Bloomingdale Park are located along the West Shore Expressway. A partially-occupied commercial development lies between Arthur Kill Road and Westfield Avenue.



Segment G (northern half)

Segment G (southern half)

Land Uses: (no waterfront access)

Veterans Road East and West, the service roads of the West Shore Expressway, vary in width and change from two-way to one-way direction at Englewood Avenue. South of Englewood Avenue Veterans Road West has three southbound travel lanes and two northbound lanes, separated by a median. Conversely, Veterans Road East has three northbound lanes separated by a median from two southbound lanes. North of Englewood Avenue both roads narrow to three lanes, with northbound travel on Veterans Road East and southbound travel on Veterans Road West. They are 34 feet wide and carry light to moderate traffic. The roads terminate at Woodrow Road, where an underpass beneath the West Shore Expressway connects the two service roads.

Bloomingdale Road is a major north-south arterial within the segment. It is a two-lane road varying in width from 24 to 54 feet. A recently-developed community of single-family homes is located south of Woodrow Road to the northeast of Bloomingdale Park. The vacant property west of Maguire Avenue, between Stafford and Ramona avenues, is slated for a residential development known as Maguire Estates.

Parks and Recreation:

The 138-acre Bloomingdale Park contains two segments: the recently-acquired Bloomingdale Extension west of Bloomingdale Road, and the original portion to the east, which is bounded by Bloomingdale, Ramona, and Lenevar avenues, lightly-traveled wide residential streets, and by Drumgoole Road West, the service road for the Korean War Veterans Memorial Parkway. Bloomingdale Park is primarily wetlands and forests and is currently being improved with new recreation facilities. Equestrians currently use Sharrotts Road to ride from Clay Pit Ponds Park to the equestrian trails of Bloomingdale Park.

Transit:

Transit service is provided by two local and two express bus routes. They follow the Bloomingdale Road, Woodrow Road and Rossville Avenue corridor, as well as Foster and Woodrow roads.

Proposed Route

Staten Island currently has the fewest total miles of greenways in any of the five boroughs. There are short segments in the Gateway National Recreation Area, the South Beach boardwalk, at Richmond Terrace, and near the Snug Harbor Cultural Center. The completion of the Staten Island South and West Shore greenways would provide close to 17 additional miles of greenways, greatly enhancing the non-motorized transportation network on the island.

The following chapter includes a detailed description of the proposed route on a segment-by-segment basis. Maps and accompanying cross-sections tied to those maps, as well as other graphic representations, detail the proposed alternatives.

Along the South Shore the recommended routes focus on the waterfront and Hylan Boulevard. The creation of an uninterrupted waterfront route is a long-term project and needs the cooperation of numerous stakeholders. For this reason, a 'parallel' route is proposed along Hylan Boulevard. This on-street route alternative makes use of the existing street and its right-of-way. It would connect the neighborhoods along Hylan Boulevard between Great Kills Park and Tottenville. More importantly, while people may choose to travel leisurely along the shoreline, the on-street route may be preferred by commuters. The on-street route would also provide the critical links where the waterfront route is not continuous.

In the South Shore portion, the waterfront route is discussed at the beginning of every segment, followed by the design proposals for Hylan Boulevard.

For the West Shore section, waterfront access cannot be provided due to the land uses and developments along the shore. Here the proposed route follows existing streets, making use of excess street bed, street rights-of-way and parkland.

The proposed routes that make up each segment were identified using the following criteria:

- Accessibility and directness to major origins and destinations
- Routes proposed by the Staten Island Borough President's Staten Island Bikeway and Cultural Trail and the Department of City Planning's Bicycle Master Plan
- Connections with other greenway routes
- Street width and observed traffic volumes
- Ecological considerations including wetlands, bluebelt property, wooded areas, and waterfront erosion
- Attractiveness of route and scenic views
- Consultation with the community

Segment A

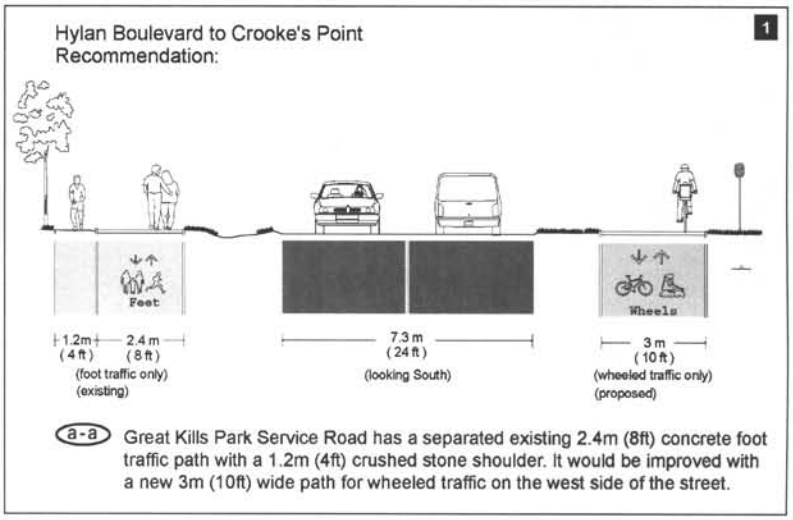
Hylan Boulevard to Crooke's Point:

The South Shore Greenway would begin at the entrance to Great Kills Park. Two separate trails for wheeled and non-wheeled users would parallel Great Kills Park Service Road on either side. The first trail, for foot traffic only, is an existing eight-foot wide concrete path with a four-foot wide crushed stone shoulder located east of the service road. The existing foot trail travels south to connect to the existing harbor esplanade, beach center, and Crooke's Point.

The proposed addition, for wheeled users only, would be a new 10-foot wide asphalt trail, located west of the service road [see cross-section (a-a) and the following illustrations].

Crooke's Point to Mansion Avenue:

A valuable addition to the park's existing path system would be a standard multi-use trail travelling around Great Kills Harbor. It could connect Crooke's Point to the existing bridge between Fairlawn Avenue and Great Kills Park and would create a loop within the park for greenway users, offering unique views of maritime activity and the coast. Paths would have to be designed in conjunction with the National Park Service and the park's environmental center and provide safe access for all users to and around the active fishing area.

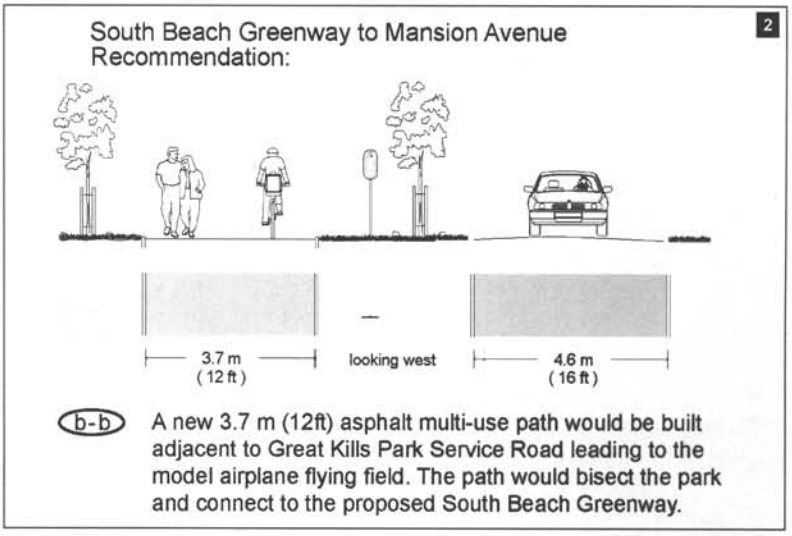


Existing:
Great Kills Park Service Road, looking east

Proposed:
A three meter (10ft) trail for wheeled traffic

South Beach Greenway to Mansion Avenue:

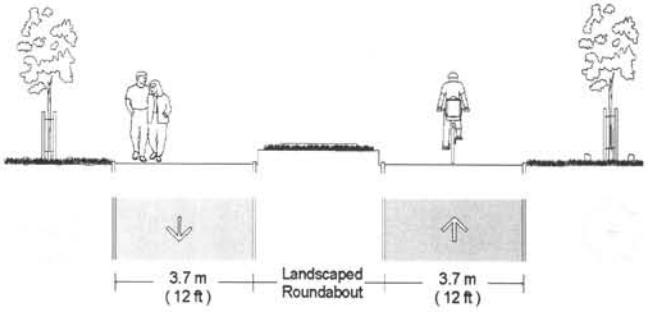
The NYC Department of Parks and Recreation has funding for an additional six-mile stretch of greenway that would connect to the South and West Shore Greenway project at Great Kills Park. This six-mile section, called the South Beach Greenway, would include paths through Great Kills Park, Oakwood Beach, Cedar Grove Beach, Miller Field Recreational Area, Midland Beach, South Beach, and Fort Wadsworth. The design is almost complete and construction is expected to start in late 2003.



To provide a connection to the proposed South Beach Greenway, the greenway route would cross the park, running east-west along the model airplane flying field, ballfields, and running track [see cross-sections (b-b) and (c-c)]. Between Great Kills Service Road and the model airplane flying field, a new 12-foot multi use trail would be located adjacent to the existing sewer easement and the asphalt road. The separation would prevent potential conflicts with motorized traffic to and from the field. Between the model airplane field and the ballfield parking lot the greenway route would use the existing road. East of the ballfield parking lot, the greenway route would diverge from the service road and connect to Fairlawn and Mansion avenues.

3

South Beach Greenway to Mansion Avenue
Recommendation:



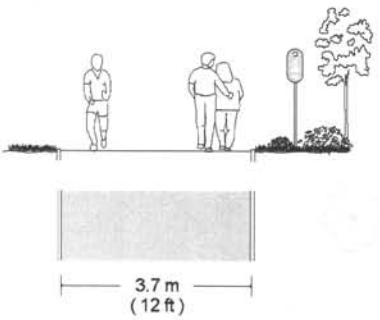
(c-c) Service road at model airplane flying field.

Bridge Connection to Mansion Avenue:

An existing bridge currently connects Great Kills Park and Fairlawn Avenue. The bridge is seven feet wide and has bollards on either side to keep wheeled users from crossing without dismounting. A recommendation of this master plan is to replace this bridge with a new 12-foot wide bridge, preferably aligned with Mansion Avenue. The reasons for the bridge replacement are: the bridge's bollards prevent access to people in wheelchairs; erosion is destabilizing the bridge's base; and the bridge's alignment requires greenway users to navigate around tight turns and a narrow trail to connect to the proposed Mansion Avenue extension (see next paragraph).

4

Mansion Avenue and Tennyson Drive
Recommendation:



(d-d) Unbuilt Mansion Avenue.

Mansion Avenue to Tennyson Drive:

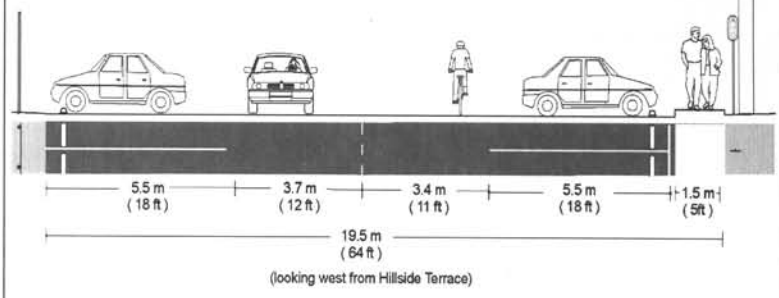
After crossing the bridge, a 12-foot wide multi-use trail is proposed within the unbuilt Mansion Avenue right-of-way between Fairlawn Avenue and Great Kills Yacht Club [see cross-section (d-d)]. DCP's 1997 *Streets of South Richmond Study* recommended extending Mansion Avenue to Fairlawn Avenue for motor vehicles. If roadway construction occurs before the implementation of the multi-use-trail, roadway design should include an adjacent multi-use trail connecting to the new bridge. Furthermore, the streetscape should be improved, where space permits, with landscaping and benches to capitalize on the waterfront location.

From the Great Kills Yacht Club, the greenway route would follow a new signed route along existing Mansion Avenue, which becomes Tennyson Drive west of Hillside Terrace. Interesting views of maritime-related activities are found along this segment. Due to discontinuous sidewalks, the creation of a pedestrian lane in the short-term would provide some designated space for pedestrians. In the long-term the construction of new five-foot sidewalks within the street's right-of-way is recommended to link existing sidewalks and provide safer pedestrian movement [see cross-section (e-e) and the illustration on the following page]. This recommendation would not remove travel lanes or parking.

The Greenway route would then continue along Tennyson Drive to Cleveland Avenue. This intersection should be improved to provide safe vehicle, pedestrian, and bicycle movements, including an extension and realignment of the northeast curb, and the posting of regulatory "STOP" signs and bars.

Mansion Avenue and Tennyson Drive
Recommendation:

5



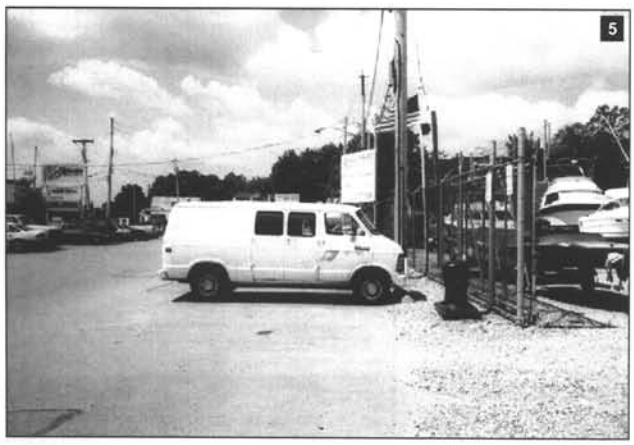
(looking west from Hillside Terrace)

e-e The long-term recommendation is to build a continuous sidewalk system of 1.5 meter (5ft) along Mansion and Tennyson avenues between Great Kills Yacht Club and Cleveland Avenue.

Note:
Mansion Avenue is an important link between Great Kills Park and the residential neighborhood to the west. Mansion Avenue has several commercial businesses including restaurants, private marinas, and boat dealerships that generate traffic during certain times of the day during the warmer months of the year. The project team recognizes the concerns of business owners that encouraging joggers, walkers, bicyclists, and in-line skaters to use Mansion Avenue is potentially unsafe. However, there are also business owners who would welcome increased foot and bicycle traffic. Furthermore, neighborhood residents are interested in improved access to the park.

The project team has developed two alternate proposals based on seasonal use of Mansion Avenue that balance the interests of the commercial businesses and the residents:

(1) During the summer months, when Mansion Avenue experiences heavier motor vehicle traffic volumes, greenway users would be directed to either proceed with caution or use Hylan Boulevard. Hylan Boulevard might also carry park-bound bicyclists and alleviate some bicycle traffic on Mansion Avenue.
(2) During non-summer months, when traffic volumes are lighter, greenway users would use Mansion Avenue without restrictions.



Existing:
Mansion Avenue looking west

Proposed:
Mansion Avenue to be improved with a 1.5m (5 ft) sidewalk

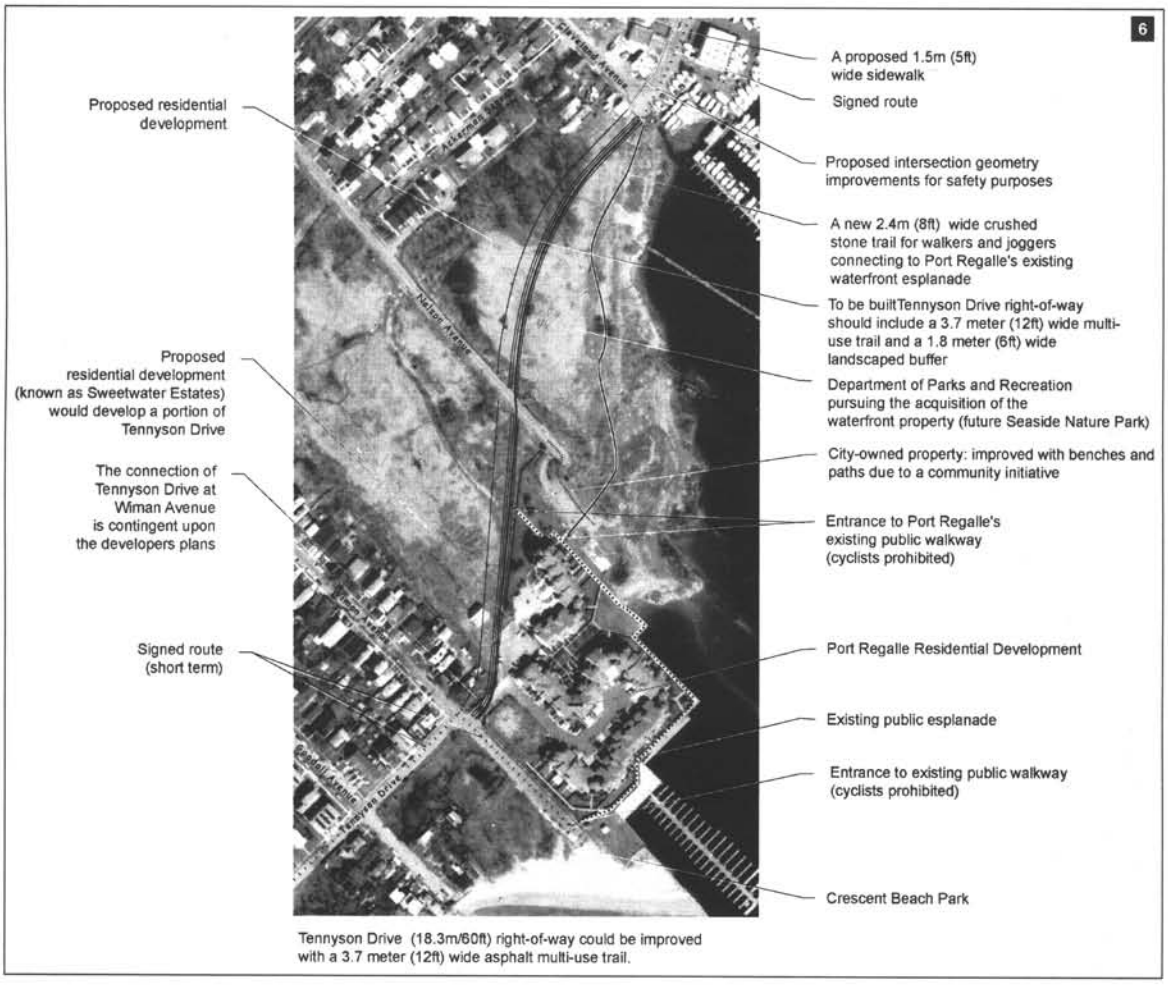
Cleveland Avenue to Wiman Avenue:

Short-Term Recommendation:
Continuing west, a signed route would direct greenway users on Cleveland Avenue, Hartford Street, Nelson Avenue, Sweetwater Avenue and Wiman Avenue to reach Tennyson Drive at Crescent Beach Park. The streets travel through a quiet residential area; greenway signage should instruct users to travel slowly.

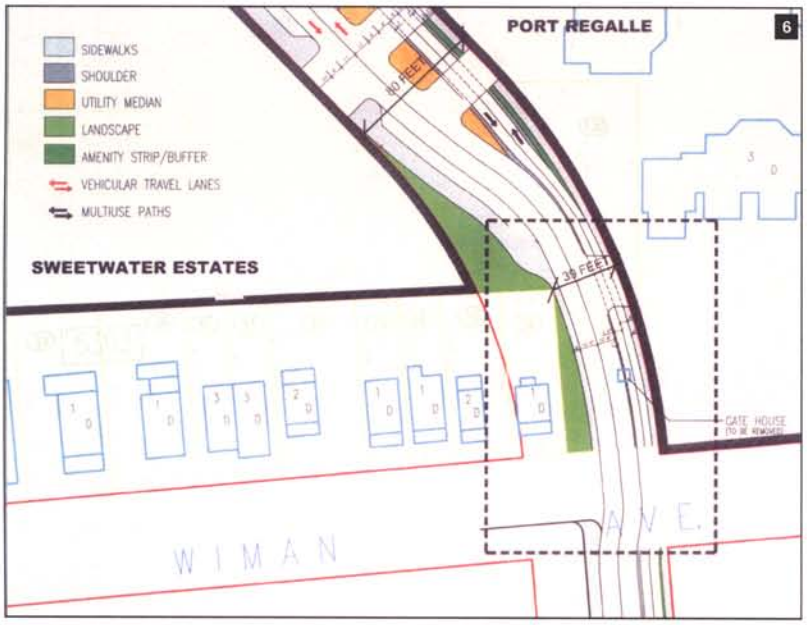
Long-Term Recommendation:
Cleveland Avenue to Nelson Avenue:
The vacant property located west of Tennyson Drive between Clevelend and Nelson avenues is in private ownership. NYC plans include mapping the publicly-owned waterfront land east of Nelson Avenue, currently under Parks Department jurisdiction (Lot 70), along with public acquisition of the parcel from Cleveland Avenue to and including the Nelson Avenue right-a-way as Seaside Nature park.

The recommendation for this segment is to construct a 12-foot wide multi-use trail with a six-foot wide landscaped buffer within the Tennyson Drive right-of-way. A separate crushed stone trail for walkers and joggers could be located along the waterfront within the future Seaside Nature park, connecting to Port Regalle's existing pedestrian-only waterfront esplanade, located between Nelson and Wiman avenues.

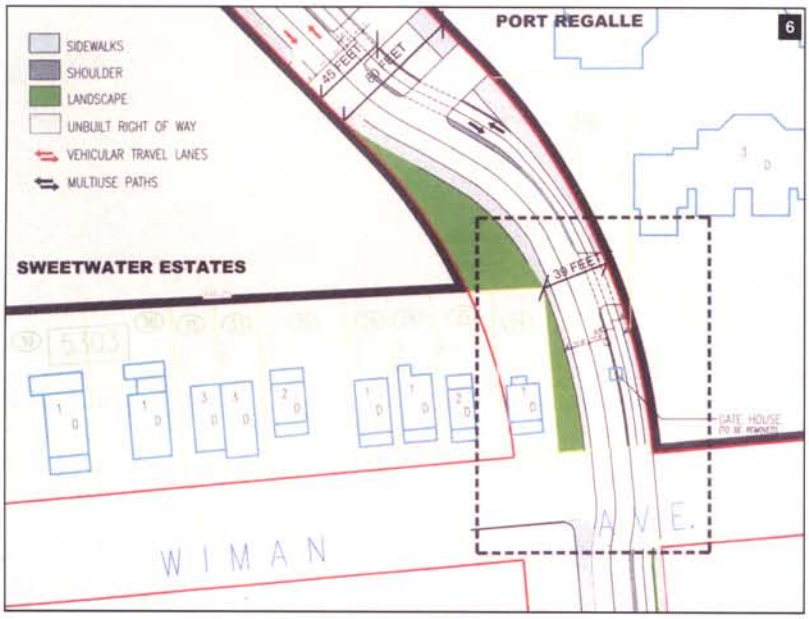
Nelson Avenue to Wiman Avenue:
Between Nelson and Wiman avenues, to the west of Port Regalle, a residential development known as Sweetwater Estates is proposed. The waterfront land immediately north of Port Regalle, as well as a triangle between the unbuilt Tennyson Drive and Nelson Avenue, is publicly-owned and under the jurisdiction of the Parks Department. It has been improved as a community garden. To continue the greenway, a 12-foot wide multi-use trail should be built within the Tennyson Drive right-of-way, along the east side of the roadbed (see possible alternatives on next page).



Tennyson Drive (18.3m/60ft) right-of-way could be improved with a 3.7 meter (12ft) wide asphalt multi-use trail.



Proposed Alternative A: Greenway built into the 80ft right-of-way of Tennyson Drive

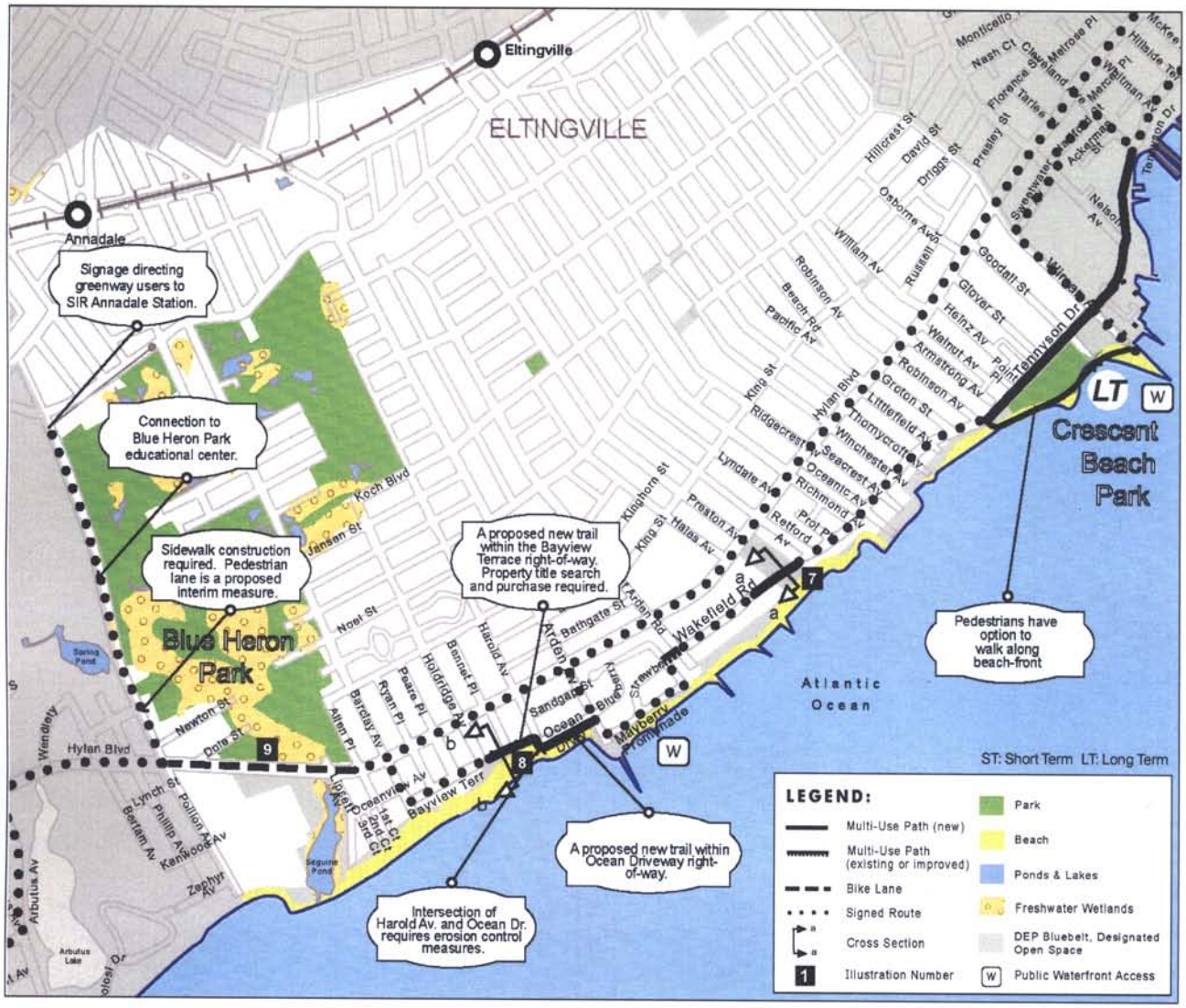


Proposed Alternative B: Greenway built into the 45ft wide paving plan of the proposed Sweetwater Estates development

Hylan Boulevard:

Due to the peak-hour travel regulations, the entire roadbed with all its travel lanes is used for moving motorized traffic. The striping of a five-foot bike lane, adjacent to an eight-foot parking lane, is not feasible. Bicyclists in this segment of Hylan Boulevard are advised to travel on-street in the curblane. Since the curblane is currently not striped, the delineation of the lane could channelize the traffic and alleviate potential confusion. Bicylists using the curblane would be able to ride within this designated lane.

Segment B



Wiman Avenue to Robinson Avenue:

Short-Term Recommendation:
At Wiman Avenue, the route would continue on-street as a signed route along Tennyson Drive to Point Place. West of Point Place, a 10-foot wide crushed stone path would be constructed within the unbuilt Tennyson Drive right-of-way to connect to Robinson Avenue.

Long-Term Recommendation:
Community representatives have requested that the Department of Parks and Recreation improve Crescent Beach Park. The Crescent Beach Civic Association has prepared a conceptual design of Crescent Beach Park. A tot lot has been installed at Point Place. A sea wall to prevent flooding is required and to be built by the Army Corps of Engineers. If the sea wall is constructed, an esplanade for shared use should be built to provide community access along the waterfront and to connect the Port Regalle esplanade to Robinson Avenue.

In addition to the seawall, the greenway would, in the long term, run as a Class 1 facility along the western edge of Crescent Beach Park, between Wiman and Robinson avenues. The route would be run on-street for one block to circumnavigate exisiting residences on Goodall Street.

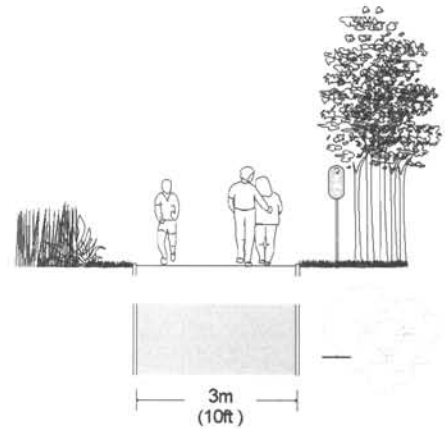
Robinson Avenue to Arden Avenue:

West of Robinson Avenue, the greenway would continue as a new signed route along Tennyson Drive until Retford Avenue. From Retford Avenue, a connection would be provided by a 10-foot wide crushed-stone trail along the unbuilt portion of the street that crosses DOS/park property [see cross-section (a-a) and the aerial illustration]. The greenway would again continue as a signed route along Wakefield Road once the built street is reached.

West of Wakefield Road (at the intersection with Woods-of-Arden Road) an existing 12-foot wide service road provides a link to Mayberry Promenade in the Atlantic Village subdivision. Currently a chain-link gate prevents motor vehicle access, but allows pedestrian use. By replacing the fence with breakaway bollards, access for all non-motorized traffic could be granted. Along the Atlantic Village neighborhood, the greenway would continue on-street as a signed route. The on-street portion along Mayberry Promenade in Atlantic Village would be adjacent to the existing public walkway and the pedestrian esplanade with beach access.

7

West of Retford Avenue
Recommendation:



a-a Crushed Stone Trail.

7

Unbuilt Tennyson Drive 24.3m (80ft) right-of-way between Retford Avenue and Hales Avenue could be improved with a 3 m (10ft) wide crushed stone path.

Arden Avenue to Blue Heron Park/Poillon Avenue:

At Arden Avenue, two recommendations are proposed for the greenway route.

Short-Term Recommendation:
To continue west from Mayberry Promenade, the greenway would travel north via a signed route on Arden Avenue to connect to the Hylan Boulevard route.

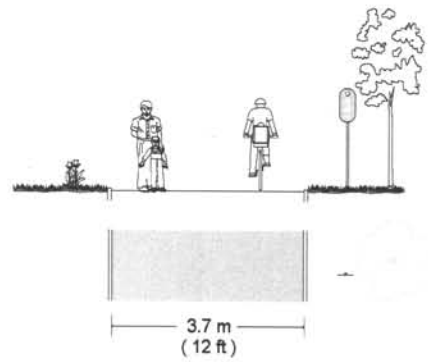
Long-Term Recommendation:
Greenway users would travel along the waterfront on a proposed 12-foot wide multi-use trail adjacent to Ocean Driveway and Harold Avenue. The intersection of Ocean Driveway and Harold Avenue is narrow and dangerous. Future improvements to the intersection, coordinated with erosion control efforts, should include widening this section in order to accommodate a multi-use trail adjacent to the roadway.

West of Harold Avenue, the greenway route would provide continuous access within the unbuilt Bayview Terrace right-of-way [see cross-section (b-b) and the aerial illustration]. The multi-use trail should be improved with landscaping and furniture and the trail design should blend in with the existing Bayview Park, a community waterfront garden operated by the Department of Parks and Recreation.

At the connection with the built part of Bayview Terrace (west of Holdridge Avenue), the greenway route would continue as a signed route along Bayview Terrace, then use Barclay Avenue to connect to Hylan Boulevard. This loop back to the on-street route is due to a lack of space along the waterfront at Seguine Pond.

8

West of Harold Avenue
Long-Term Recommendation:



b-b Unbuilt Bayview Terrace

8

Unbuilt Bayview Terrace 18.3m (60ft) right-of-way between Harold Avenue and Holdridge Avenue could be improved with a 3.7m (12ft) wide multi-use path. Further research of the right-of-way ownership, through a title search, is required in order to purchase the property if feasible.

Hylan Boulevard and Spurs:

At Wiman Avenue, the peak hour traffic regulations discontinue; parking in the curblane is possible at any time. North of Arden Avenue there are residential and commercial uses along the boulevard, with frequent use of the curb lane for parking. West of Allen Place (at the beginning of Blue Heron Park) the parking discontinues and becomes infrequent on the remaining part of Hylan Boulevard.

Between Wiman Avenue and Allen Place, the Hylan Boulevard on-street route would continue as a signed route within the curb lane. Again, the curb lane is not delineated and striping of a 10-foot moving lane could channelize traffic and help designate the parking/moving lane to be shared with bicyclists. As an alternative, the curb lane could be delineated as a parking lane by adding a solid stripe. This parking lane could then be shared by bicyclists as a combination parking-cycling lane.

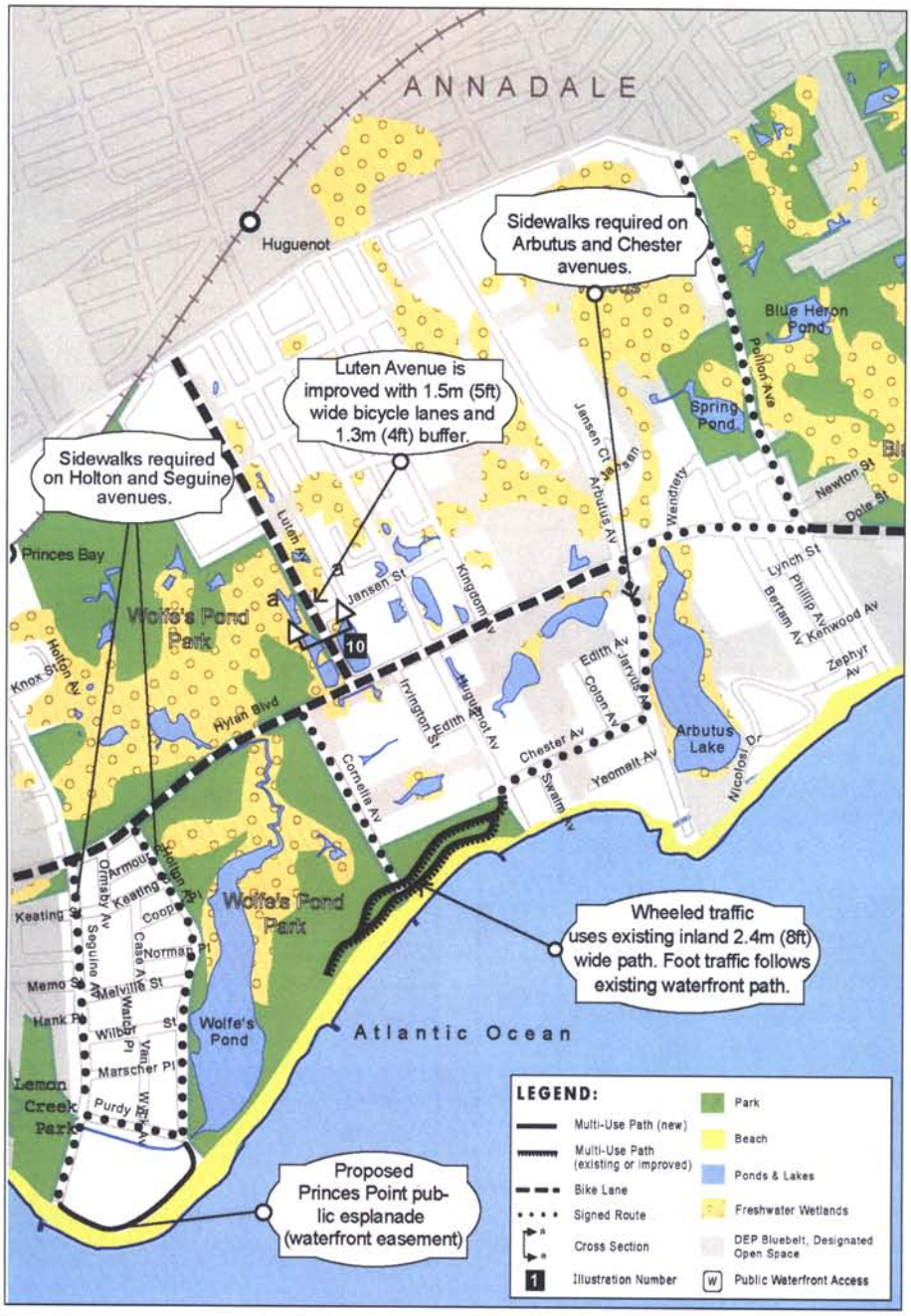
Between Allen Place and Poillon Avenue, as Hylan Boulevard parallels Blue Heron Park, a five-foot bike lane with a three-foot striped buffer would be added, as shown in the illustrations below. The construction of a sidewalk along Blue Heron Park is recommended.

A spur off Hylan Boulevard along Poillon Avenue would connect to Blue Heron Park. The park offers hiking trails and an educational center. Bike racks for secure parking should be provided at the center. Along Poillon Avenue, sidewalks would need to be constructed in the long term; a five-foot pedestrian lane is proposed as an interim measure. Signs could also direct users to the nearby Annadale SIRT station.

Existing:
Hylan Boulevard, along Blue Heron Park, looking east

Proposed:
Five-foot bike lane with three-foot striped buffer.

Segment C



Poillon Avenue to Wolfe's Pond Park:

Traveling through the Annadale and Prince's Bay residential neighborhoods, the greenway would continue on Hylan Boulevard. At Arbutus Avenue a new signed route would lead greenway users along Arbutus and Chester avenues, through Wolfe's Pond Park to Cornelia Avenue. This loop would provide scenic views of Arbutus Lake. Public beach access is provided within Ocean Gate Estates development.

The greenway within Wolfe's Pond Park would travel on an existing eight-foot wide multi-use crushed-stone path through a natural preservation area which links to an asphalt path of similar width. The

greenway would become a dual carriageway through the segment of the park developed with active recreation facilities. Foot traffic would be directed to an existing eight-foot wide asphalt path along the waterfront, while wheeled traffic would be directed to an existing eight-foot wide inland asphalt path. The two paths converge at the boathouse.

Cornelia Avenue to Lemon Creek Park:

To continue west, greenway users would follow a signed route on Cornelia Avenue connecting to the route on Hylan Boulevard, where after a short section bisecting Wolfe's Pond Park, a signed route along Holton Avenue and Purdy Place would bring greenway users back to the waterfront, connecting to the proposed Prince's Point public esplanade and crushed-stone paths in Lemon Creek Park. At the park, bicycle racks are provided, allowing greenway users to enjoy the meandering foot paths, waterfront, picnic tables and lawns. The racks are part of the NYC Parks Department's Hike and Bike program. A signed route along Seguine Avenue would continue the greenway, connecting once again to the Hylan Boulevard route. Construction of sidewalks is recommended along Holton and Seguine avenues.

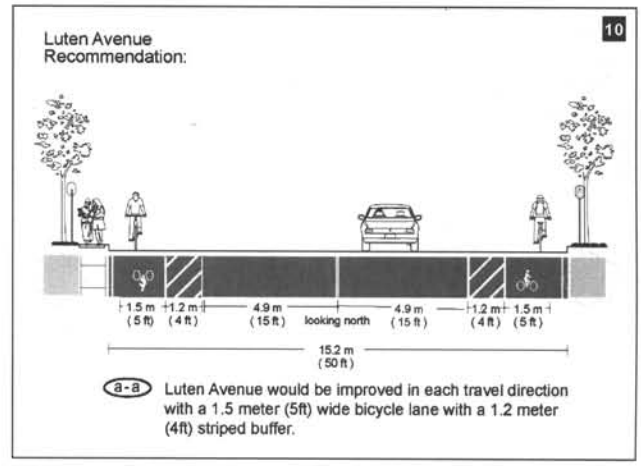
Hylan Boulevard and Spurs:

Between Poillon and Arbutus avenues single family homes line Hylan Boulevard and a gas station at Arbutus Avenue causes some activity in the unmarked curb lane. The bike route would only be signed as the rider uses the shared moving/parking lane in this section. Again, the curb lane should be striped with a solid line to designate a shared parking/cycling lane.

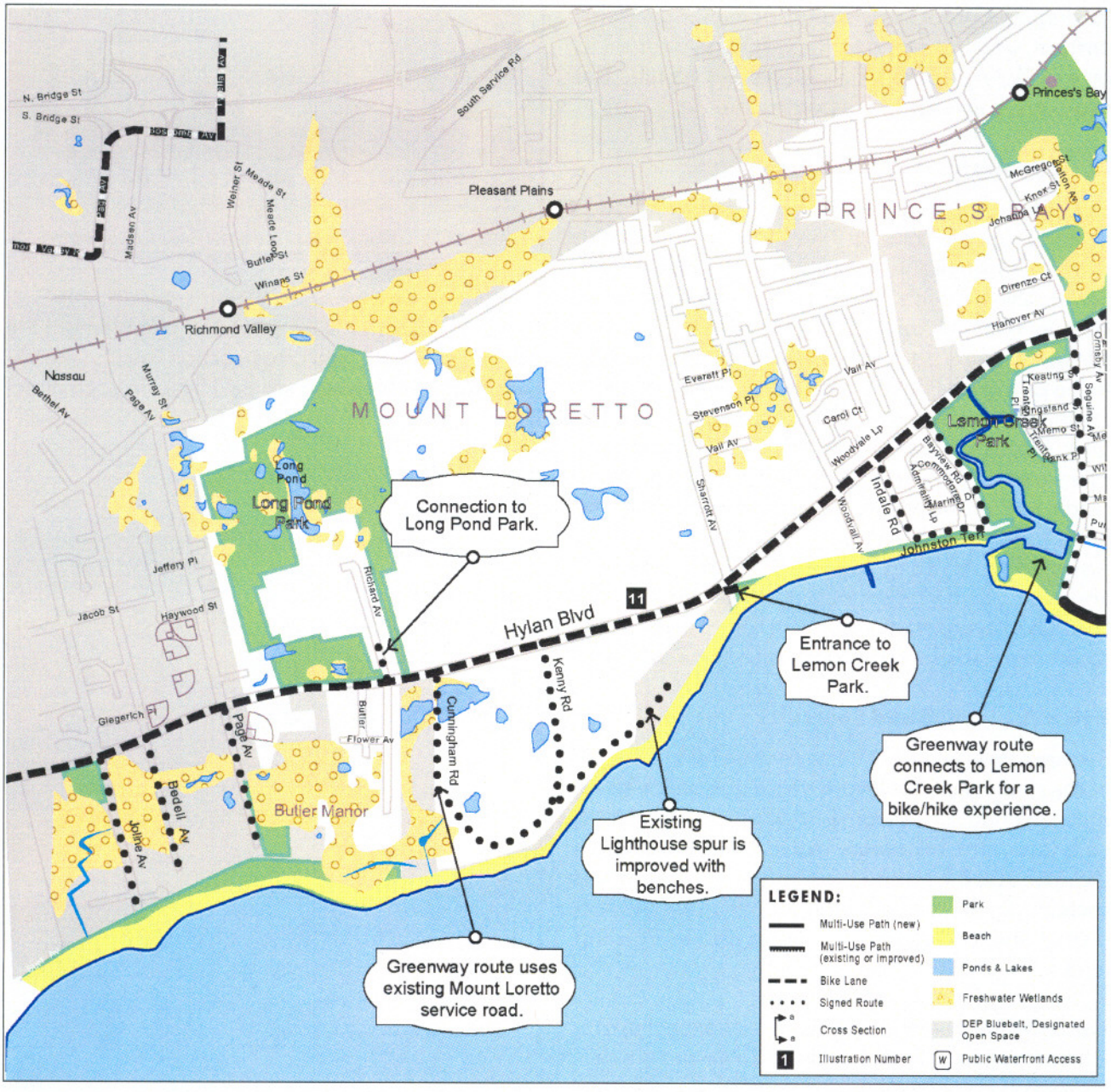
West of Arbutus Avenue (to Seguine Avenue) the majority of the properties lining Hylan Boulevard are designated open space, park land, and very few privately-owned parcels that are undeveloped. The route would continue in the form of a five-foot lane with a three-foot striped buffer.

The construction of sidewalks on Hylan Boulevard along parks is recommended.

Along Luten Avenue, an inland spur from the Hylan Boulevard route to Tottenville High School is recommended. A five-foot wide bicycle lane with a four-foot striped buffer is proposed to complement the existing sidewalk [see cross-section (a-a)]. The vehicle traffic lanes would still be 15 feet in each direction.



Segment D



Lemon Creek Park to Page Avenue:

To continue traveling west, greenway users would return to Hylan Boulevard following the on-street route through Lemon Creek Park. A signed route along Bayview Avenue, Johnston Terrace, and Indale Road would provide a loop back to the waterfront west of Lemon Creek. At Sharrott Avenue the boulevard route would connect to the western entrance of Lemon Creek Park, with access to foot paths, a fishing pier and a boat launch.

West of Sharrott Avenue, the greenway would continue on Hylan Boulevard to Kenny Road in the Mount Loretto property. At Kenny Road, a loop would lead back to the waterfront. An eastern spur to the lighthouse could be provided along an existing eight-foot wide asphalt path adjacent to the waterfront. This eastern spur should be improved with benches and landscaping. To the west, a proposed signed route on Cunningham Road would close the loop and bring

users back to Hylan Boulevard. Between Cunningham Road and Page Avenue the on-street Boulevard route would continue the South Shore Greenway.

New York State has acquired Mount Loretto, south of Hylan Boulevard, as protected open space, allowing the public access to its rolling meadows and waterfront views from its high bluffs. The designation of this greenway route within Mount Loretto property must be coordinated with plans of the New York State Department of Environmental Conservation.

Hylan Boulevard and Spurs:

As in the previous segment, this section of Hylan Boulevard mostly traverses park land and open space, such as the Mount Loretto property. There are only a few clusters of residences along this section of Hylan Boulevard, located immediateely east and west of Lemon Creek Park. Most properties are reached from neighborhood streets other than the boulevard, or offer ample driveway space.

The on-street route would continue with bicycle lanes of five feet and an adjacent three-foot wide striped buffer zone in each direction, as shown in the illustration. In sections of the bulevard the shoulder vegetation along the curb has grown over and extended into the roadbed. These 'encroachments' would have to be removed to regain the entire width of the roadbed and accommodate the bike lane. The on-street route would offer unique views of the historic Mount Loretto property.

A signed route on Richard Avenue would connect to Long Pond Park north of Hylan Boulevard.

Proposed five-foot bike lane with three-foot buffer on Hylan Boulevard.

Segment E

Page Avenue to Shore Road:

In segment E the route would continue along Hylan Boulevard. At Sprague Avenue the waterfront route would resume, leading greenway users along a signed route on Sprague Avenue, Surf Avenue, and Loretto Street. West of Loretto Street the greenway would continue on Billop Avenue to Swinnerton Street, adjacent to the densely-forested lands of Conference House Park [see cross-section (a-a)].

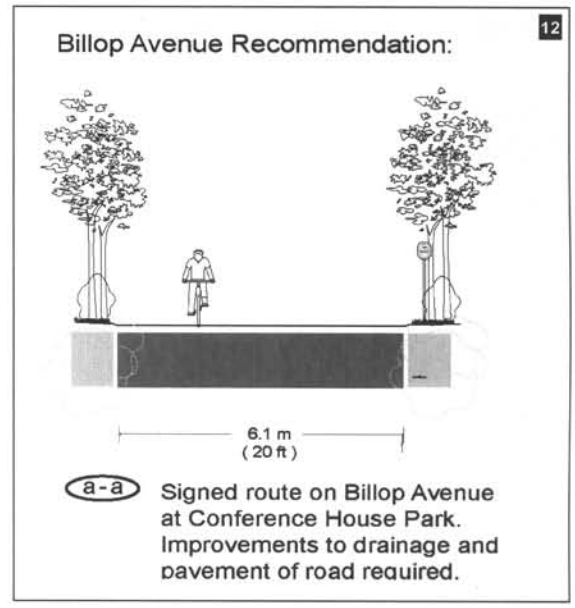
In the long-term a multi-use path could be built in the mapped right-of-way of Surf Avenue between Page and Sprague avenues and between Loretto and Brighton streets.

West of Swinnerton Street, greenway users would connect to a new 12-foot wide multi-use trail within the rights-of-way of Billop and Surf avenues and Satterlee Street, adjacent to Conference House Park [see cross-section (b-b)]. The multi-use trail could be separated from the roadway by a landscaped median varying in width. These lightly-traveled streets are property of the Department of Parks and Recre-

ation. In order to make the interim on-street riding experience pleasant, improvements to pavement and drainage would be required.

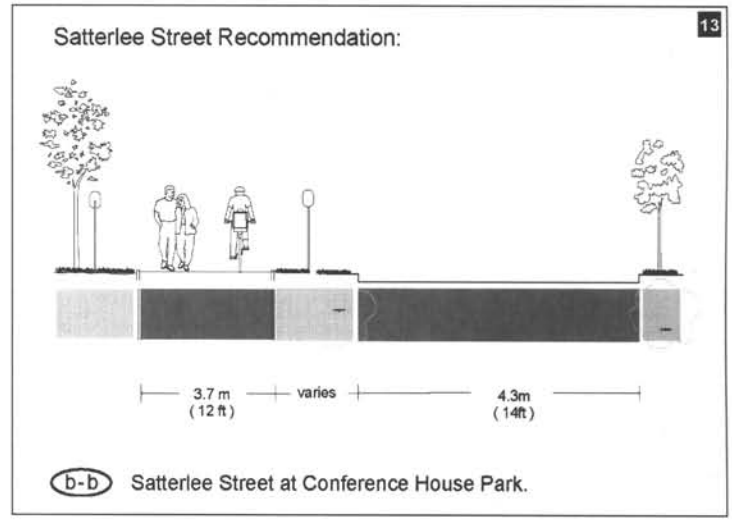
At the intersection of Satterlee Street, Hylan Boulevard and Craig Avenue, the greenway would continue north as a signed on-street route along one-way northbound Satterlee Street to Shore Road. The historic Conference and Billop houses are located along Satterlee Street. The southbound greenway between Shore Road and Hylan Boulevard would follow Craig Avenue, connecting to Satterlee Street just south of Hylan Boulevard.

Shore Road marks the transition between the South Shore and the West Shore sections of the greenway.



Shore Road to Arthur Kill Road:

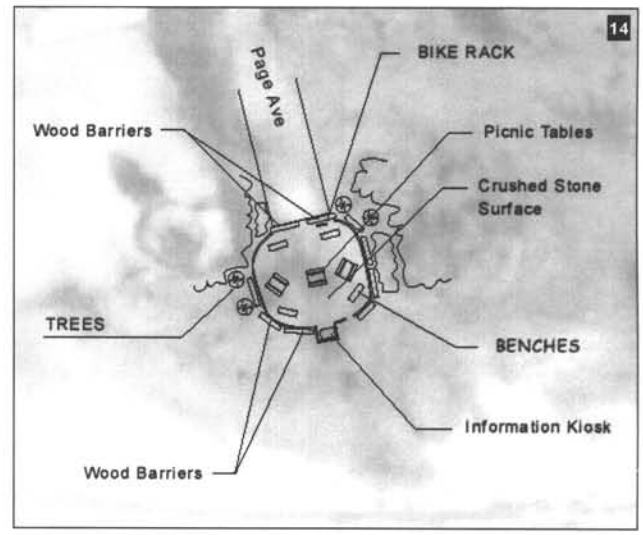
The West Shore Greenway would continue as a signed route on Craig Avenue, a pleasant residential street, passing through Tottenville's commercial center at Main Street. At Barnard Avenue, the route would follow that neighborhood street to connect to Arthur Kill Road, a major 34-foot wide, north-south arterial, where greenway users would follow the on-street signed route.



Hylan Boulevard and Spurs:

At Page Avenue Hylan Boulevard reduces in width to 60 feet (without median) before it terminates at Conference House Park. Bicyclists would share the to be delineated parking lane from Page Avenue, the beginning of this segment, to the boulevard's end at Satterlee Street. A long-term recommendation for this segment of the route would be to install a six-foot bicycle lane and to eliminate a travel lane in each direction. A traffic analysis is required to determine the feasibility of this recommendation.

Page, Bedell, and Joline avenues dead-end at the Raritan Bay shoreline. In order to provide greenway users with more waterfront access, these streets should be signed as spurs off of Hylan Boulevard. Greenway users could enjoy ocean views at the street ends. Improvements of the street ends with benches, picnic tables, landscaping, and special signage to educate visitors on the area's history and its sensitive ecosystem are recommended. Bollards, fencing and

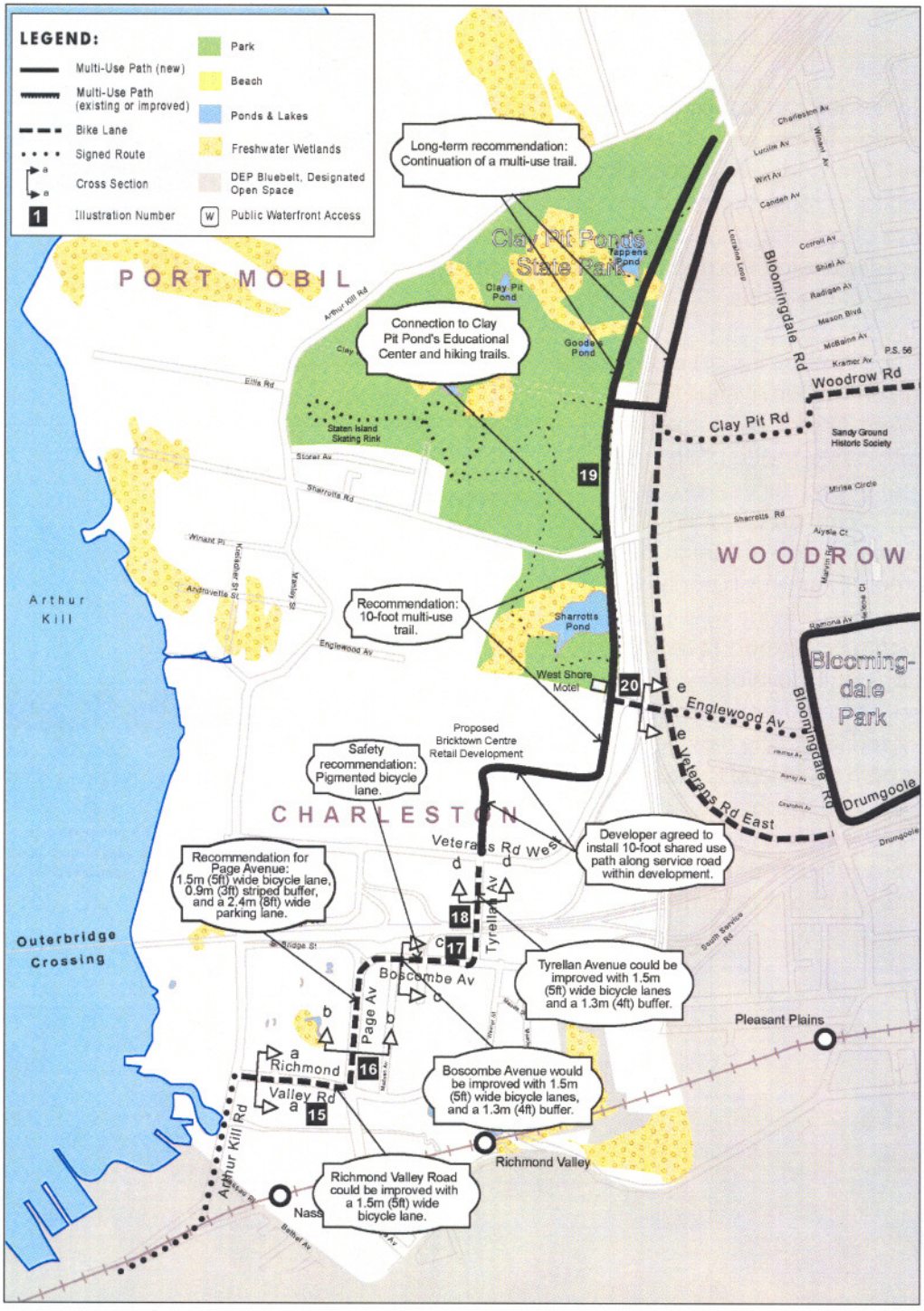


Proposed schematic design for street-end improvements at Page Avenue.

signage could be used to prevent motorized vehicles from accessing the beachfront.

At Bentley Street, informational signage would direct greenway users from Craig Avenue to the Tottenville Station of the SIRT. Bicycle parking facilities at the railroad station are recommended.

Segment F



Arthur Kill Road to Veterans Road West:

West Shore Greenway users would continue north through the Charleston neighborhood, following Arthur Kill Road along a signed route. At Richmond Valley Road the route would turn east, and then follow Page, Boscombe and Tyrellan avenues. Richmond Valley Road would be improved with a five-foot bicycle lane [see cross-section (a-a)]. Page Avenue would be marked with a five-foot wide bicycle

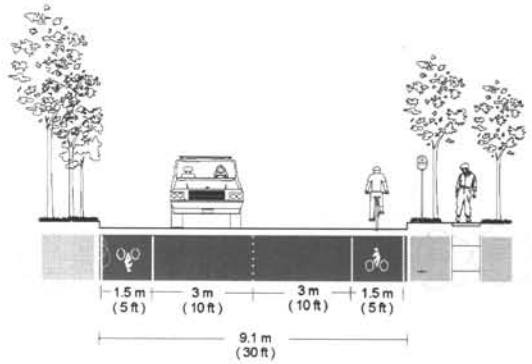
lane and a three-foot striped buffer, adjacent to an eight-foot wide parking lane [see cross-section (b-b)]. As the greenway continues east, Boscombe Avenue would be improved with a five-foot wide bicycle lane and a four-foot striped buffer [see cross-section (c-c)].

The bicycle lanes at the intersections of Page Avenue and South Bridge Street, as well as Boscombe Avenue and the Outerbridge Toll Service Road, should be pigmented to increase their visibility. Signage to warn motorists of crossing bicycles could also be installed to increase awareness and improve safety at these trafficked intersections.

From Boscombe Avenue the greenway route would continue north on Tyrellan Avenue to Veterans Road West. Tyrellan Avenue would be striped with a five-foot bicycle lane and a four-foot striped buffer [see cross-section (d-d)]. The property east of Tyrellan Avenue and north of Korean War Veterans Memorial Parkway is partly developed. The property to the west is currently undergoing preliminary review for a commercial/retail development. A separated path along Tyrellan Avenue might be realized within the new development. This path could lead to the proposed shared-use path within the Bricktown Centre development (see next paragraph), providing a non-motorized connection from the south with new retail shops.

15

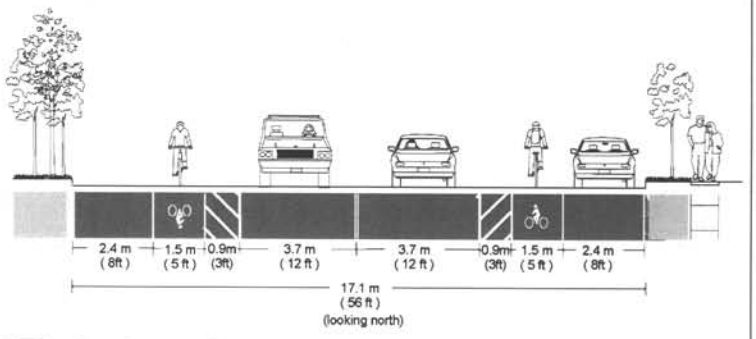
Richmond Valley Road
Recommendation:



(a-a) Richmond Valley Road at Arthur Kill Road.

16

Page Avenue
Recommendation:



(b-b) Page Avenue at Richmond Valley Road would be improved with a 1.5 meter (5ft) wide bicycle lane and a 0.9 meter (3ft) striped buffer, adjacent to a 2.4 meter (8ft) wide parking lane in each direction.

16

Existing:
Page Avenue, looking north.

16

Proposed:
Five-foot bike lanes with a four-foot buffer, adjacent to an eight-foot parking lane.

Veterans Road West:

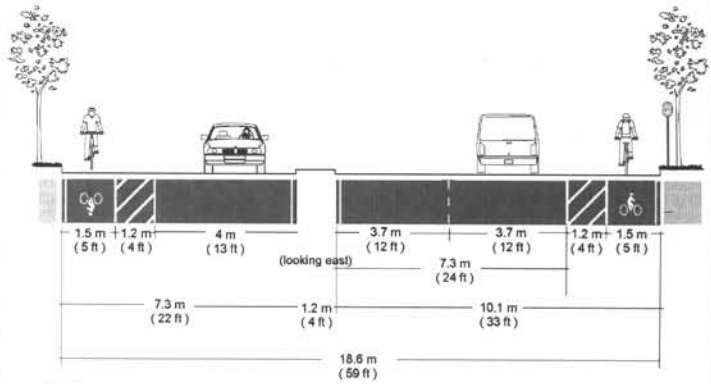
Tyrellan Avenue terminates at Veterans Road West, where the greenway route would connect to a Class 1, 12-foot multi-use-trail within the service road of the upcoming Bricktown Centre development.

This path would provide a connection between the southern and eastern loop of Veterans Road West. As part of the retail development, a portion of the site along Veterans Road West would be set aside as a preservation area and become part of the newly-created Charleston Park north of the commercial development. From the service road to Englewood Avenue, the greenway trail would be located within a 16-foot corridor under Parks jurisdiction (11-foot street right-of-way and an adjacent five-foot strip of the preservation area). The two-way trail would be 10 feet wide with a buffer to safeguard users from vehicular traffic.

At Englewood Avenue, greenway users would be directed to use the West Shore Motel's sidewalk. Equestrians would be directed to the existing equestrian trails within Clay Pit Pond Park. North of the motel, greenway users would continue on a proposed 10-foot wide multi-use trail connecting to Clay Pit Road. This path would also link up to the proposed Clay Pit Ponds Park educational center to be located at Sharrotts Road.

17

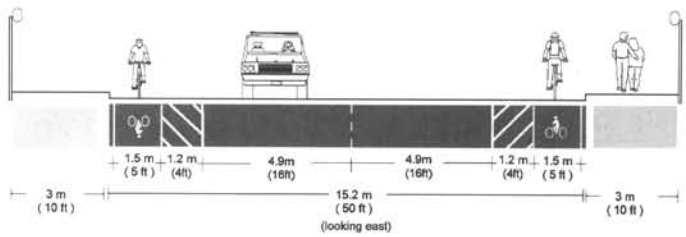
Boscombe Avenue
Recommendation:



(c-c) Boscombe Avenue at Madsen Avenue to be improved with a 1.5 meter (5ft) wide bicycle lane and a 1.2 meter (4ft) striped buffer.

18

Tyrellan Avenue
Recommendation:



(d-d) Tyrellan Avenue, between Page Avenue and Veterans Road West, would be improved with a 1.5 meter (5ft) wide bicycle lane and a 1.2 (4ft) meter buffer.

Existing:
Veterans Road West, looking south along Clay Pit Ponds Park.

Proposed:
A 10-foot multi-use trail along Veterans Road West.

Englewood Avenue Bridge:

Englewood Avenue Bridge is an important connection between Clay Pit Ponds Park and Bloomingdale Park. The bridge's roadbed is 50 feet wide, with 10-foot sidewalks on either side. In order to limit potential conflicts between the multiple users, including equestrians, bicyclists, and pedestrians, the following design is recommended:

Equestrians would be directed to use the bridge's northern sidewalk; pedestrians would use the southern sidewalk. Bicyclists would use the south side of the bridge roadway where the eastbound lane would be improved with a two-way bicycle lane, protected by a three-foot wide concrete barrier (see cross-section (e-e)].

With the addition of the recommended two-way bicycle lane and increased usage by equestrians and pedestrians, the geometry of the intersections to the east and west of the bridge may require redesign, to improve sightlines for motorists and bicyclists and insure overall safety.

Additional recommendations for long-term consideration are the following:

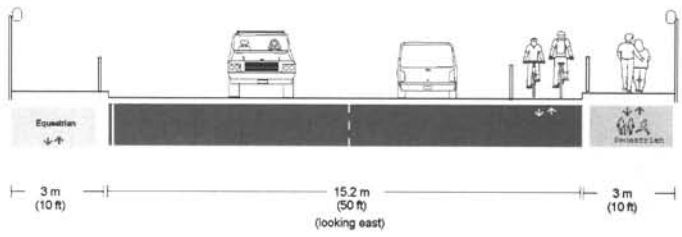
Veterans Road East and West:

Community District Three has recommended extending the Veterans Road East and West service roads from their current terminus at Woodrow Road to Bloomingdale Road in order to alleviate increasing automobile congestion. Should the service roads be extended in the future, the implementation of an adjacent multi-use trail is recommended. The trail should accommodate bicyclists, pedestrians and equestrian users, where feasible, and connect to Bloomingdale Road to the north. The extension of the proposed greenway would also provide for additional recreational facilities in the neighborhood where the lack of pathways and sidewalks causes people to exercise in the roadway.

Additional analysis will be required for the further continuation of the West Shore greenway route beyond Bloomingdale Road.

20

Englewood Avenue Bridge
Recommendation:

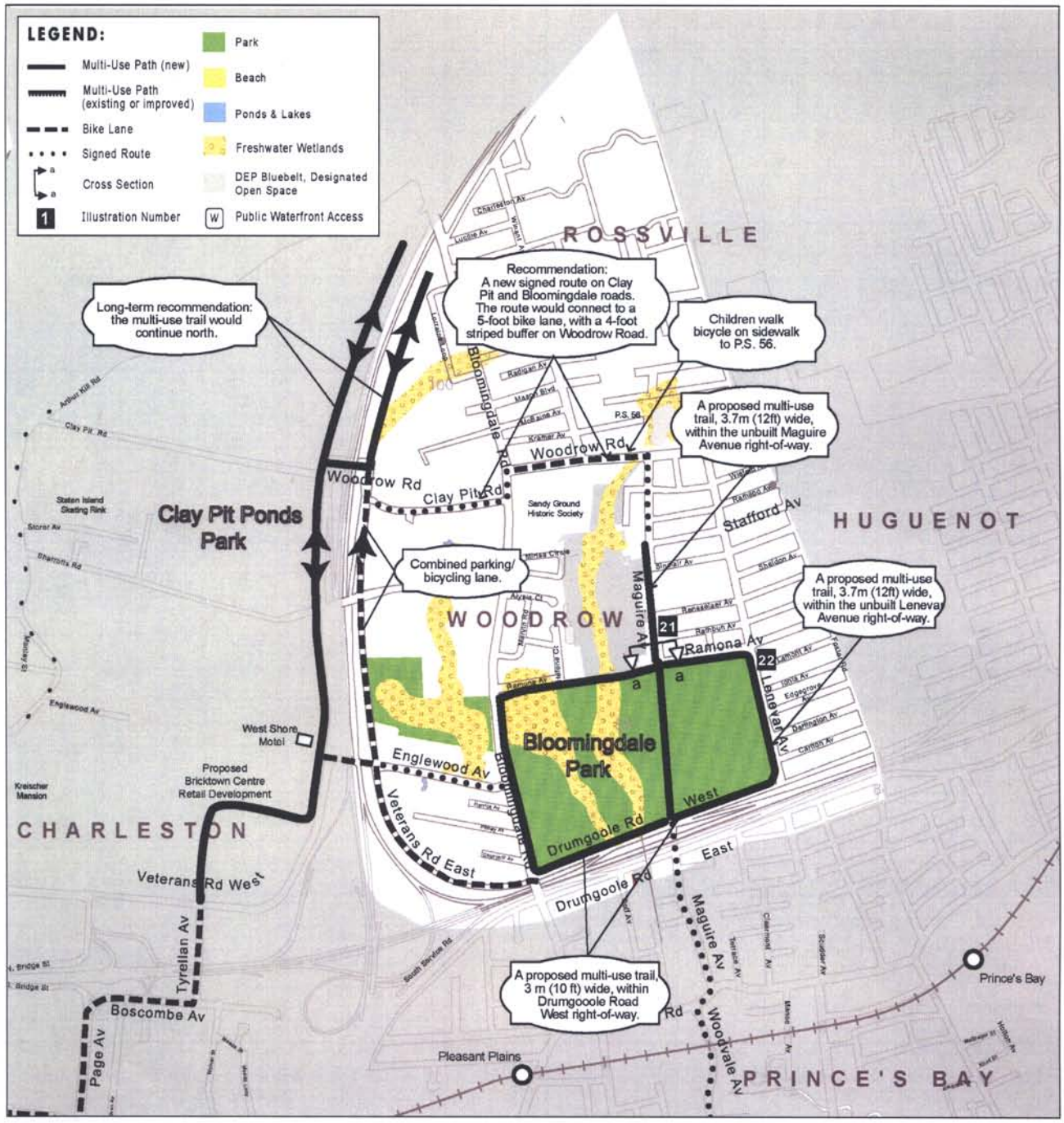


(e-e) Englewood Avenue Bridge between Veterans Road East and West:
Equestrians would use the northern sidewalk; pedestrians would use the southern sidewalk. The roadway would be improved with a two-way bike facility with a barrier.

Arthur Kill Road:

Community Board Three has also identified the need to widen Arthur Kill Road, currently a 34-foot wide, winding arterial. As plans develop, a 12-foot wide multi-use path should be explored. A new path would provide connections to the historic Kreischer Mansion, Staten Island Ice Skating Rink and the western entrance of Clay Pit Ponds Park for a bike/hike excursion.

Segment G



Veterans Road East:

Veterans Road West connects to Veterans Road East at the Woodrow Road underpass. Veterans Road East is a three-lane northbound street between Englewood Avenue and Woodrow Road. Between Englewood Avenue and Bloomingdale Road (at the southwestern corner of Bloomingdale Park), Veterans Road East is a two-way, five-lane roadway, with three northbound lanes and two southbound lanes, separated by a concrete median. A sidewalk lines the eastern side of the road.

The recommendations for Veterans Road East are as follows:

Between Englewood Avenue and Woodrow Road the curb lane of Veterans Road East is used as a travel lane and as a parking lane by local residents. The recommendation is to stripe a combined parking/ bicycling lane. A shared lane is feasible as the lane measures 11 feet on average. Greenway signage should be installed and the bike route should be striped on-street.

Between Englewood Avenue and Bloomingdale Park/ Drumgoole Road West the lane configuration of Veterans Road East changes as previously described. A choice of route recommendations is provided for this section:

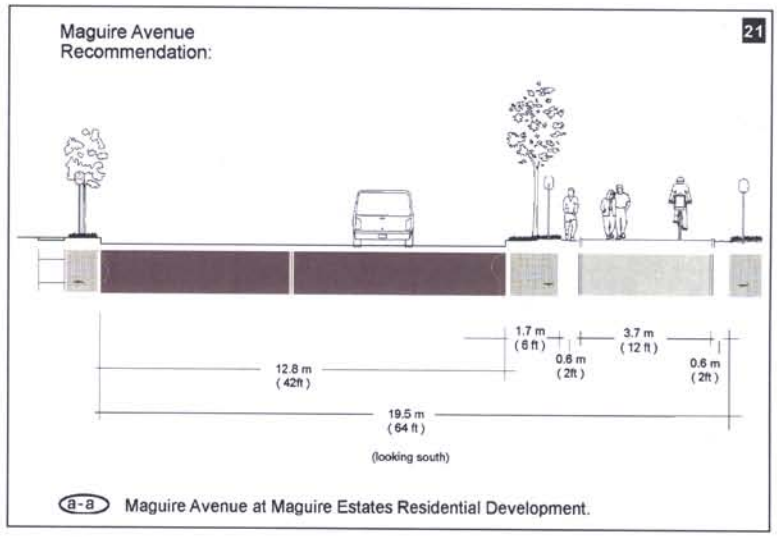
- Englewood Avenue offers two-way travel for greenway users and connects Bloomingdale Park and Clay Pit Ponds Park. No improvements to the segment along Veterans Road East are necessary.
- If a connection along the service road is desired, a northbound five-foot bike lane with a four-foot buffer could be designated on the curbside travel lane. Current traffic volumes support this recommendation. This change from three to two travel lanes is not expected to impact vehicular flow.
- For southbound travel the impact on traffic would seem greater if a five-foot bike lane with a four-foot buffer was to replace an existing travel lane. This would mean the reduction of southbound vehicular travel lanes from two to one, and is not recommended.

Access to Bloomingdale Park:

Two options are proposed for an east-west connection between Veterans Road East/West and Bloomingdale Park.

North Option:
Just south of the Woodrow Road underpass, a signed route would lead greenway users east along Clay Pit Road, then turn north on Bloomingdale Road for approximately 200 feet. From there five-foot striped bicycle lanes with four-foot buffers are recommended along Woodrow Road to Maguire Avenue. The greenway would then turn south along a signed route on Maguire Avenue through the residential neighborhood to Bloomingdale Park. The property west of Maguire Avenue, between Stafford and Ramona avenues, is slated for a residential development known as Maguire Estates. The developer has committed to construct a 12-foot wide multiuse trail within the unbuilt portion of the street right-of-way, as recommended by DCP [see cross-section (a-a)].

South Option:
Englewood Road, the direct connection between Clay Pit Ponds Park, Englewood Avenue Bridge, and Bloomingdale Park, would be a signed route.



Bloomingdale Park Area:

In February 2003, the Parks Department held a groundbreaking ceremony for Bloomingdale Park (portion east of Maguire Avenue). Planned are softball, baseball and soccer fields, basketball and bocce courts, a playground, and comfort station. A network of paths will provide access to the forests of Bloomingdale Park. The path system would include a perimeter greenway along Maguire, Ramona, and Lenevar avenues, as well as stone footpaths, boardwalks, and bridges at the interior of the park.

This master plan recommends similar measures regarding the path system in Bloomingdale Park. In order to preserve the natural area as much as possible, recommendations of this master plan focused

Existing:
Lenevar Avenue, looking south. Bloomingdale Park is to the right.

Proposed:
12-foot multi-use trail within the street right-of-way.

on the wide, unbuilt street right-of-ways. These recommendations are as follows:

A 12-foot multi-use trail and equestrian trail are proposed along the perimeter of the entire eastern portion of Bloomingdale Park. These trails would be located within the rights-of-way of Maguire, Ramona, and Lenevar avenues (see illustration above), as well as Drumgoole Road West. At Drumgoole Road West, the multi-use trail width would decrease to 10 feet due to space constraints.

Spur:

To return to the Raritan Bay waterfront, the greenway route would loop back south, passing through the Prince's Bay residential neighborhood. The proposed signed route would run from Drumgoole Road West along Maguire Avenue, Amboy Road, and Woodvail Avenue, terminating at Lemon Creek Park and Hylan Boulevard. The route would provide views of Bluebelt wetlands, new residential development, turn-of the century housing found on Amboy Road (the original east-west arterial along the South Shore, before Hylan Boulevard was built), and the Mount Loretto Cemetery.

Appendix A
Design Guidelines

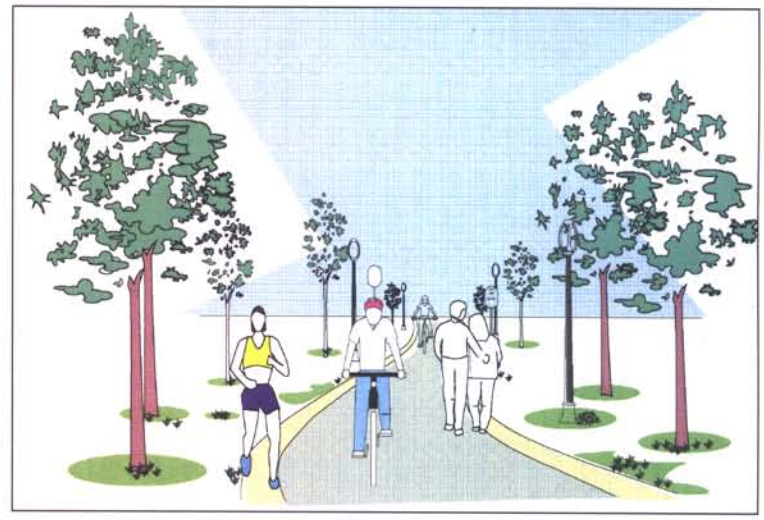
Greenway Facilities Classification

Greenways in New York City are classified by type:

Class 1: Multi-Use Trail

A multi-use trail is separated from the roadway and delineated by pavement markings and regulatory signage. Trails are usually shared by multiple users, including cyclists, pedestrians, joggers, in-line skaters, and wheelchairs. Typical widths are 12 to 16 feet.

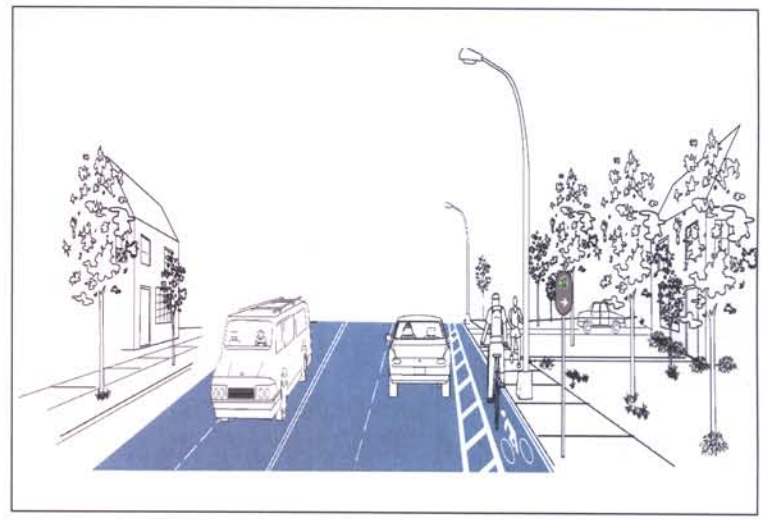
Dual carriage-way trails separate foot and wheel traffic. At trail and roadway intersections the design treatment should include bollards and landscaping to prevent access to the trail by motorized vehicles, except for maintenance and emergency vehicles.



Class 1: Multi-Use Trail

Class 2: On-Street Bicycle Lane

A bicycle lane is part of the roadway and delineated by pavement markings and regulatory signage. The lane is usually next to the curb parking lane, but may also be adjacent to the curb where parking is prohibited. The lane is usually separated from motorized traffic by a striped buffer. A sidewalk complements a bike lane to form a greenway for multiple users. The typical width of a striped bike lane is five feet, with a four- to five-foot striped buffer.



Class 2: On-Street Bicycle Lane

Class 3: Signed or Bicycle Route

A signed route has informational signage only, typically located at each block along the route. Bicyclists share the roadbed with motorized vehicles without special delineation. A signed route is typically located on lightly-traveled streets, neighborhood streets, or where space conditions do not allow the striping of a separate bike lane. A signed route also provides information directing users to bicycle lanes or multi-use trails.

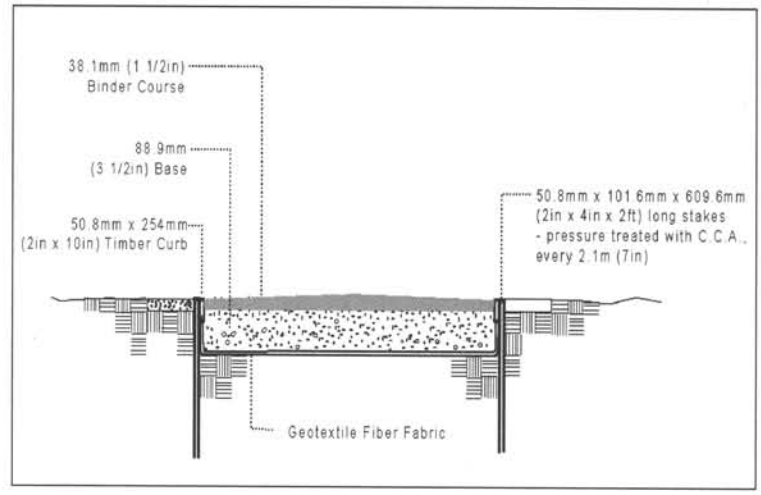
Class 3: Signed or Bicycle Route

Trail Design - Materials

Depending on space conditions and environmental aspects a choice of trail materials is available. The two most common materials are discussed below.

Asphalt Trail:

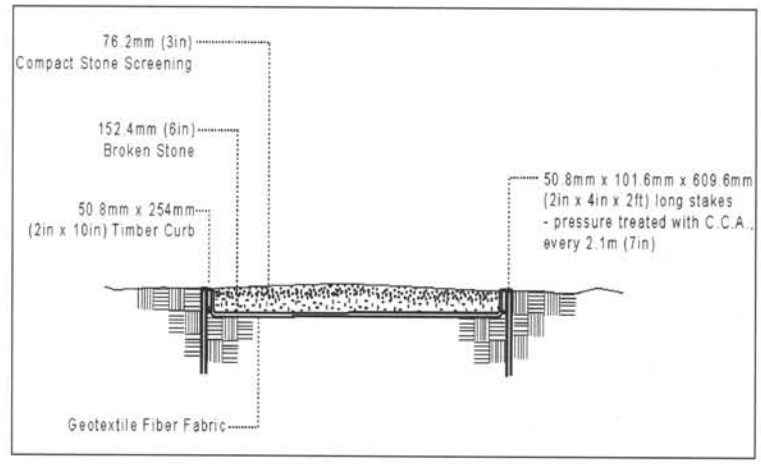
The standard material used for trails consists of hot rolled asphalt with a crushed stone clear zone. An alternative is to use concrete plates, which is more expensive to construct but provides longer durability. Trail widths may vary depending on space availability. The typical design for a two-way multi-use trail is 12 feet with a one-inch timber edge. According to the American Association of State Highway and Transportation Officials (AASHTO), the minimum width for two-way bicycle travel is eight feet.



Asphalt Trail Cross-Section

Crushed Stone Trail:

The crushed stone or chipped wood trail design is often used in environmentally-sensitive areas. Trail width may vary depending on the environmental sensitivity of the natural landscape. Design standards are the same as for asphalt trails. If bicycle travel has to be excluded for environmental reasons, trail width may be less than eight feet.

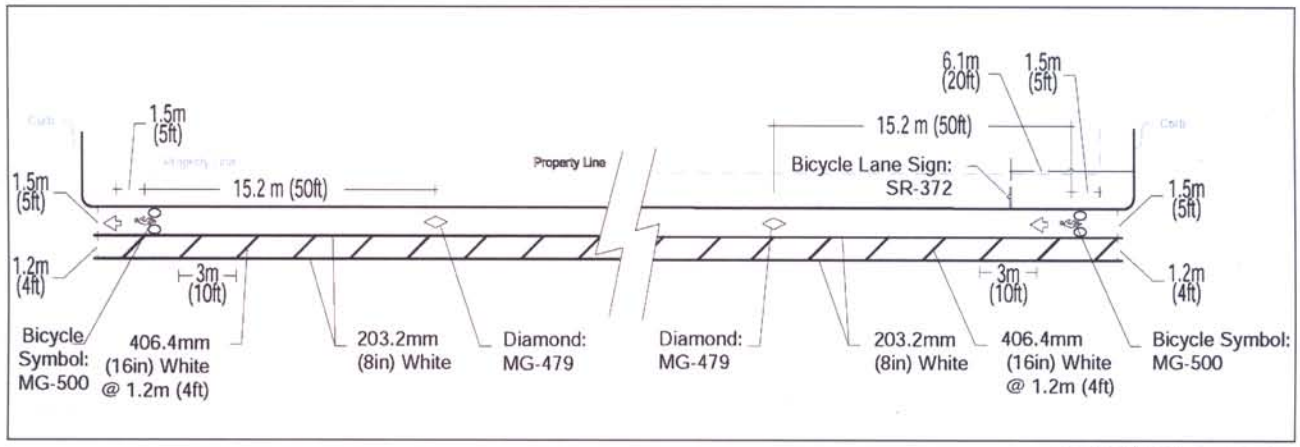


Crushed Stone Trail Cross-Section

Typical Details

Bicycle Lanes:

A bicycle lane is used to channelize one-way bicycle travel. The design may vary depending on roadway width and traffic conditions. According to AASHTO the minimum width for bicycle lanes is five feet; in several U.S. cities four-foot bike lanes may be found. A bike lane may be accompanied by a striped buffer zone to provide additional space separating the bicyles from the automobile lane and increase the visibility of the bicycle lane. The width of the buffer zone depends on the available roadway space. Two feet is the minimum, the typical width is four to five feet. Bicycle symbols and diamonds further identify the lane.

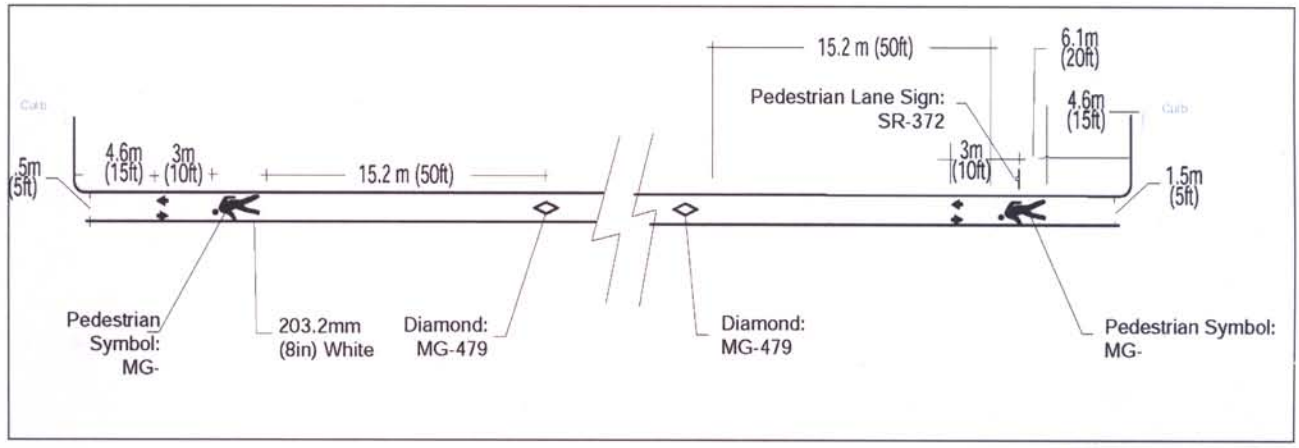


Typical Bike Lane Design

Pedestrian Lanes:

The use of pedestrian lanes in a greenway route development is an infrequent recommendation. With a lack of sidewalks, the obvious solution would be to build sidewalks along properties lacking them. However, sidewalk construction costs must be incurred by the property owner. Pedestrian lanes, a less costly alternative, may temporarily allow for safe pedestrian circulation.

Pedestrian lanes are most suitable on roads that may safely accommodate a pedestrian lane and two-way traffic. These roads usally carry low vehicular volumes and are wide enough to delineate a pedestrian lane.

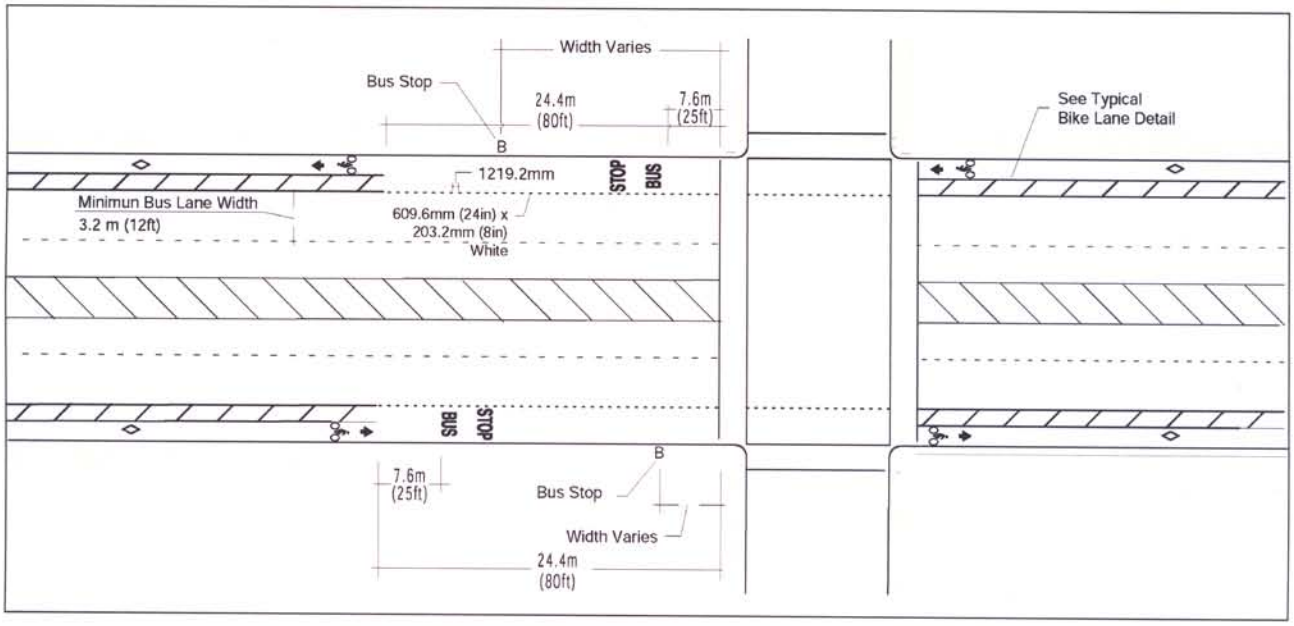


Typical Pedestrian Lane Design

Bus and Bike Interface:

The design for the convergence of a bus and a bike lane includes signage and pavement markings, warning both bus driver and cyclist in advance of the convergence area.

At a bus stop the bike lane is typically discontinued for approximately 80 feet. Bikes and buses share the same roadspace. Regular striping of the bike lane continues past the bus stop.

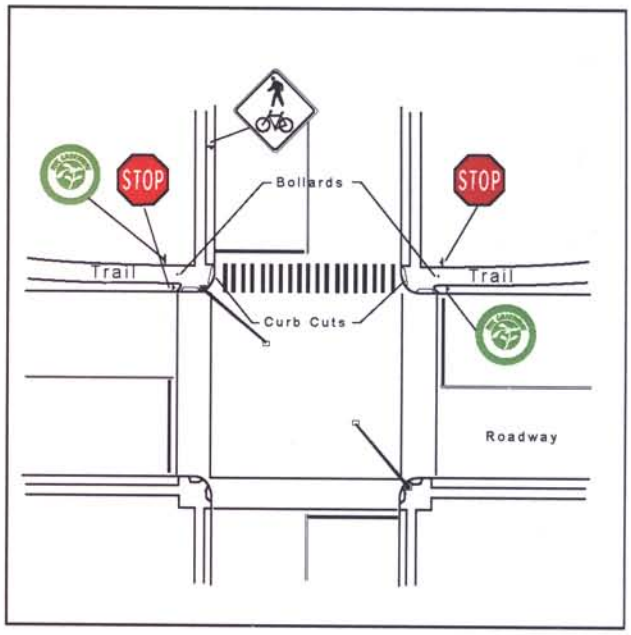


Bus and Bike Lane Interface

Trail and Roadway Interface

The design of a trail and roadway interface is extremely important in greenway or trail development. AASHTO provides design guidelines as shown in the diagrams and also recommends the following:

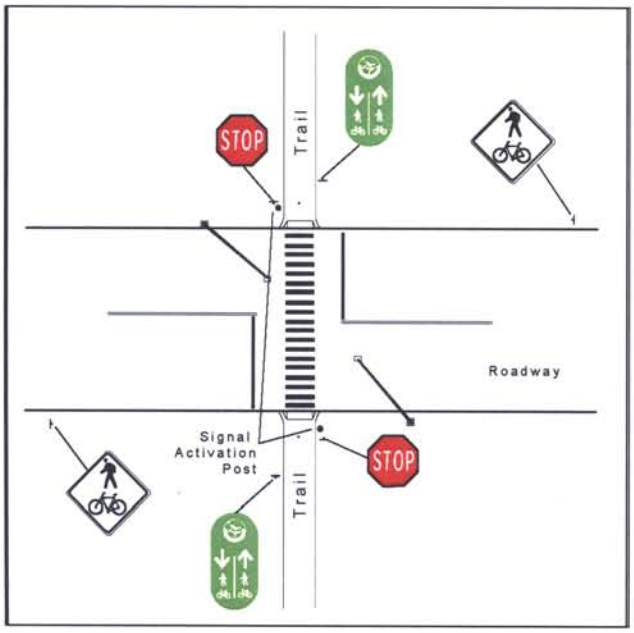
- Traffic controls (signals, stop signs, etc.) should be located so that motorists and cyclists are not confused by which controls apply to them.
- When a path terminates at an existing road, the path should be safely integrated into the existing system of roadways.
- Path intersections and approaches should be on relatively flat grades; stopping sight distances at intersections should be checked and adequate warning should be provided.
- Ramps and curb cuts at intersections should be the same width as paths, providing a smooth transition between the path and roadway.



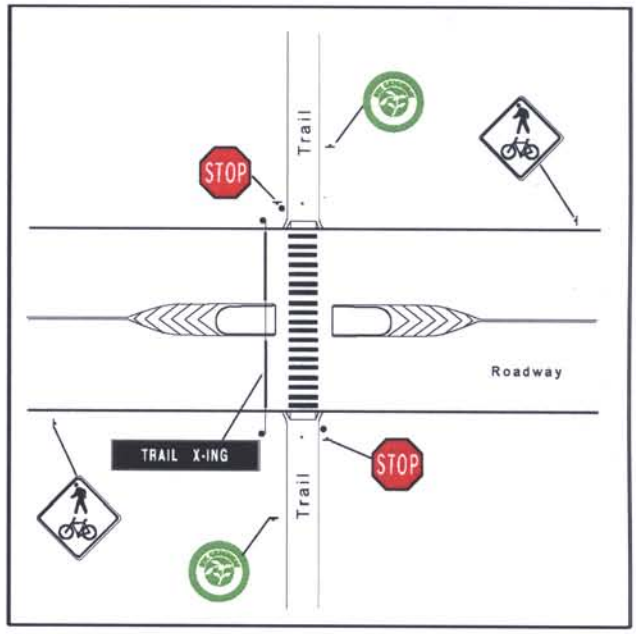
A: Trail Crossing at Signalized Intersection

Some typical design elements include warning and regulatory signage, located in advance of the junction. Where roadway crossings occur, traffic signals may be used. If the crossing occurs at a timed, signalized intersection, trail users cross with the green phase (see figure A).

When a trail crosses mid-block, there are two possible design treatments, depending upon the roadway's vehicular volume. The first design treatment for a roadway with modest vehicular volumes uses a traffic signal, activated by trail users only. This allows for continuous vehicular travel, until a trail user needs to cross (see figure B). The second design treatment, for a roadway with higher vehicular volumes, utilizes traffic islands for refuge while crossing (see figure C). High visibility pavement markings demarcate the crossing.



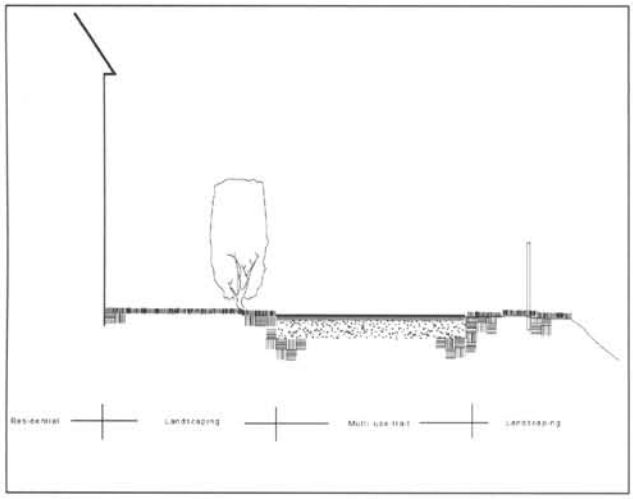
B: Mid-Block Trail Crossing with Signalization on Demand



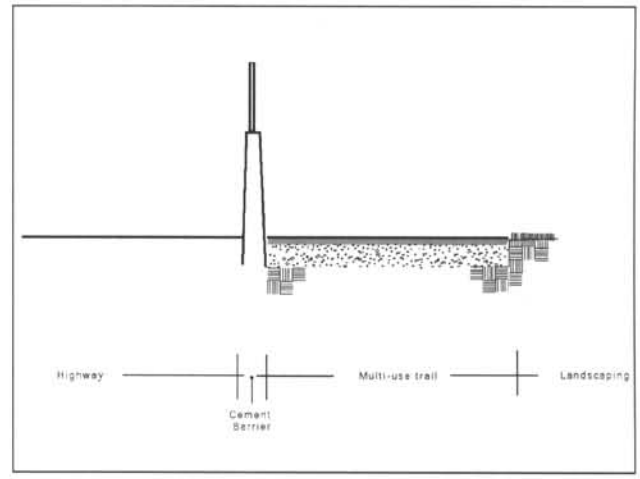
C: Mid-Block Trail Crossing with Signage

Trail/Lane Buffers

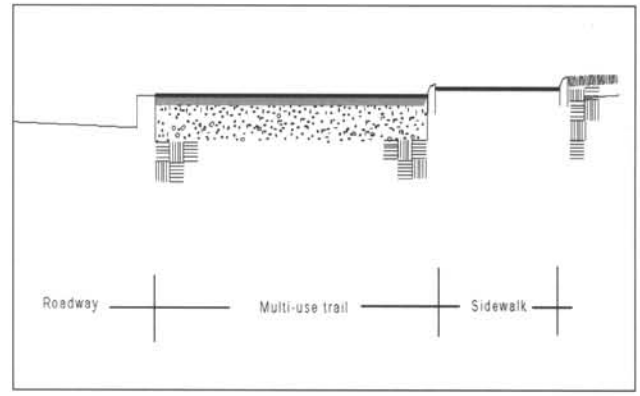
Designs to safely separate different travel modes include a combination of signage, pavement markings, and in some instances fences or landscaped medians to accommodate and separate users. A few examples and design measures are illustrated in the following figures.



Buffer between Trail and Residential Property



Physical buffer between Trail and Highway



Separation between Trail and Sidewalk

Appendix B Implementation/Cost Estimates

Given the overall length and cost of the entire 17-mile greenway, construction will occur incrementally. Potential funding sources include the TEA-21 CMAQ and Enhancement Programs, elected officials' discretionary funds, and existing agencies' capital projects.

Implementing agencies, such as the New York State Department of Transportation and New York City departments of Transportation and Parks and Recreation, would be guided by the Master Plan to construct, where possible, portions of the greenway as part of existing capital projects. In addition, segments of the greenway should be implemented within residential and commercial developments, in consultation with New York City Department of City Planning's Staten Island Office and Staten Island Community District Three. Coordinating the development of the greenway route with future construction projects would significantly reduce trail construction cost.

Typical construction of the greenway will involve general site work, such as clearing, grading, protection of trees, installation of signage, bollards, site furniture, and plant materials. Topographic surveys are also needed.

The cost estimates are given by route segment. Hylan Boulevard has been calculated separately and will be discussed first. Potential implementors are identified for each segment.

The preliminary cost of the South Shore and West Shore Greenway is $8.2 million.

Hylan Boulevard/Luten Avenue

Cost $213,314
Length: 11.8 miles
Potential Implementors: NYC DOT

Stripe bicycle lanes and shared bike/parking lanes on Hylan Boulevard as described, as well as on Luten Avenue. Estimate includes pavement markings and signage. Implementation may be funded through proposed Bicycle Network Implementation Congestion Mitigation and Air Quality (CMAQ) projects.

Segment A

Great Kills Park:

Cost: $986,822
Length: 1.61 miles
Potential Implementors: NYC DPR and National Park Service

These estimates include the construction of multi-use trails within Great Kills Park to provide connections with the Amundsen Trail and the South Beach extension.

Great Kills Park to Crescent Beach Park:

Cost: $1,513,345
Length: 0.62 miles
Potential Implementors: NYC DOT, NYC DPR, the National Park Service, developers of the proposed assisted-care center and the residential development between Cleveland and Wiman avenues.

This portion includes the construction and installation of a new bicycle and pedestrian bridge, connecting Great Kills Park to Mansion Avenue, via a new trail within Mansion Avenue's unbuilt right-of-way. Mansion Avenue, between Fairlawn Avenue and Hillside Terrace, would be improved with sidewalks, landscaping and greenway signage. Tennyson Drive would also be improved with sidewalks from Hillside Terrace to Cleveland Avenue.

Between Cleveland and Wiman avenues the potential exists for immediate trail construction as part of the development of an assisted-care facility and a residential development. However, plans for the de-

velopments have progressed. It needs to be determined if coordination is still possible. The section would include crushed stone and asphalt trails, fencing, signage, and landscaping.

Segment B

Crescent Beach Park to Mayberry Promenade:

Cost: $55,211
Length: 0.15 miles
Potential Implementors: NYC DOT, NYC DPR

This section encompasses the area between Wiman and Arden avenues and includes the construction of new trails and signed routes. Trail construction within Crescent Beach Park should be coordinated with design and improvements of the park. Between Tennyson Drive and Wakefield Road greenway implementation also consists of improvements to the land parcel [formerly a Designated Open Space (DOS) site] newly incorporated into Crescent Beach Park for passive recreation, including crushed stone paths, seating and an informational kiosk. Greenway signs would be installed between Wakefield Road and Arden Avenue.

Mayberry Promenade to Barclay Avenue:

Cost: $163,054
Length: 0.22 miles
Potential Implementors: NYC DOT, NYC DPR, and the Army Corps of Engineers.

The cost estimates include the construction of the multi-use trail between Arden Avenue and Holdridge Avenue using Ocean Driveway and Bayview Terrace. The Bayview Terrace right-of-way, between Harold Avenue and Peare Place, requires a title search; shoreline stabilization and roadway improvements are required at the intersection of Harold Avenue and Ocean Driveway.

Segment C

Bloomingdale Park to Lemon Creek Park and spur between segments C and G:

Cost: $5,376
Length: 1.48 miles
Potential Implementors: NYC DOT

This estimate includes the signed route connecting Bloomingdale Park to Lemon Creek Park and Wolfe's Pond Park. It also includes the spur from segment G back to the waterfront along Maguire, Amboy and Woodvail avenues.

Segment D

Lemon Creek Park to Page Avenue:

The recommendations for this segment do not require any striping or construction of any trails or paths. The route uses existing paths within the Mount Loretto Property. Street-end improvements to Page Avenue are included in the cost estimates for segment E, since this segment includes other streets with similar improvements.

The signage needed for segment D is very minimal, and its cost is therefore not specified.

Segment E

Page Avenue to Nassau Place:

Cost: $456,727
Length: 2.7 mi
Potential Implementors: NYC DOT, NYC DPR, and residential developers

Implementation of greenway facilities identified in segment E include installation of greenway signage for the signed routes, and the creation of scenic lookout points at the termini of Page, Bedell and Joline avenues; the construction of the Conference House Park perimeter signed route; and a multi-use trail, using the rights-of-way of Billop Avenue, Surf Avenue, and Saterlee Street.

Segment F

Nassau Place to Bloomingdale Road:

Cost: $1,489,321
Length: 3.17 miles
Potential Implementors: NYS and NYC DOT, commercial and residential developers.

The cost estimate includes the implementation of bike lanes on Richmond Valley Road, Page Avenue, Boscombe Avenue and Tyrellan Avenue. Along Veterans Road West, the construction of a multi-use trail is included between Tyrellan Avenue and Bloomingdale Road. The estimate includes the segment soon to be developed in conjunction with the Bricktown Centre shopping mall. The developer committed to construct the greenway within the site, along its service road. This will reduce the length to be built by about 1900 feet and will lower the segment's estimated cost.

Segment G

West Shore Expressway, Veterans Memorial Road, Bloomingdale Road, Foster Avenue:

Cost: $3,300,241
Length: 2.4 miles
Potential Implementors: NYC DOT, NYC DPR, and residential developers.

The estimate includes the implementation of the greenway facilities east of the West Shore Expressway. The following ongoing plans and proposals could include construction of the greenway:

Recreational facility improvements to Bloomingdale Park, Department of Environmental Protection sewer and water main installation, and the residential development of Maguire Estates. The developer for Maguire Estates has agreed to construct the multi-use trail within Maguire Avenue's right-of-way, as specified by the Department of City Planning. This will reduce the estimated cost of the segment's greenway.

Appendix C
Zoning Resolution

Special South Richmond Development District (Excerpts)

Zoning Resolution Article X: Special Purpose Districts
Chapter 7: Special South Richmond Development District

107-01 Definitions (9/9/99):
Arterial
Development
Designated Open Space
Open Space Network
Park
Waterfront Esplanade:

> A pedestrian way to be provided for the public use within the open space network along the Raritan Bay waterfront, as show on the District Plan.

107-06 District Plan (5/22/86):
The District Plan [...] shows the open space network, designated open space, park streets, waterfront esplanade, and building setback lines. [...] Appendix A [...] incorporated as an integral part of the provision of this chapter.

107-20 District Plan Elements (8/18/83):
All land in the open space network as shown on the District Plan, except public parks, is subject to the provisions of this Section.

107-21 Modification of Designated Open Space (8/18/83):
The City Planning Commission may adjust the boundaries of a designated open space on a zoning lot provided that such adjustment will not place the new boundary closer than 60 feet to a watercourse. As a condition for such adjustment in the boundaries, the Commission shall find that:
(d) such adjustment shall:

> (2) not preclude the continuity to the designated open space or the public pedestrian way or the waterfront esplanade; and [...]

107-22 Designated Open Space (9/11/75):
Any development or site alteration on a zoning lot which contains designated open space as shown on the District Plan, shall require certification by the City Planning Commission that:
(c) where required by the Commission, as indicated on the District plan, that the applicant has complied with Section 107-23 (Waterfront Esplanade).

107-23 Waterfront Esplanade (6/30/89)
When a zoning lot containing a portion of the waterfront esplanade, as shown on the District Plan, is developed, the location and design of the waterfront esplanade shall be certified by the City Planning Commission and its development shall conform to the guidelines and standards established by the Department of City Planning in consultation with the Department of Transportation and the Department of Parks and Recreation.

The waterfront esplanade shall be built and maintained by the owner [...].

The waterfront esplanade shall be either built at the same time that the zoning lot is developed or the Commission may allow the owner to comply with Section 107-24 (Performance Bond).

107-24 Performance Bond (9/11/75)
When the development of the required improvement is to be delayed for a period not to exceed 5 years from the date of the City Planning Commission certification, the owner of the zoning lot shall, prior to obtaining any certificate of occupancy, provide to the Comptroller of the City of New York a performance bond or City securities to ensure the future development of either the waterfront esplanade or the public pedestrian way.

Appendix D
A Brief History of Staten Island

Staten Island is the most geographically separate and economically homogeneous of the five boroughs. It encompasses 60 square miles and resembles an elongated diamond with a length of 13.9 miles between St. George and Tottenville, and a width of 7.3 miles between Howland Hook and Fort Wadsworth. It is the least populous and least densely populated of the five boroughs, containing approximately five percent of the city's population. Today, Staten Island remains a largely residential borough with the highest proportion of one-family and owner-occupied housing in the city.

By the sixteenth century the Raritan and Lenape Indians inhabited the island. In 1524, Giovanni da Verrazano was the first European settler to anchor his ship in the Outer Bay and sail through the Narrows. By 1609, a Dutch exploration by Henry Hudson established a trading post, and named the island Staaten Eylandt for the Netherlands. In 1661 the first permanent settlement of the island was located at Oude Dorp along South Beach, by the Dutch Woolons and Huguenot families. Twenty-two years later, when the colonies were divided into counties, Staten Island became the County of Richmond, in honor of James (brother of Charles II, in Yorkshire). Between 1698 and 1771, Staten Island's population grew from 727 to 2,847, as settlement occurred along most of the coast and interior valleys. The island's commerce included farming, fishing, shipping, piloting, maritime trade, the milling of flour and lumber, and trades such as blacksmithing and cooperage.

The construction of the Staten Island Rapid Transit rail line in 1860 triggered development along the rail corridor and its stations. Suburban communities were developed at Westerleigh and New Dorp, and waterfront amusement parks and seaside resorts were constructed at Midland and South beaches, and Oakwood and Hugenot, respectively. The city's industrial elite developed estates on the island's inland hills. In 1906, the borough's civic center moved from Richmondtown to St. George. By 1901, 67 percent of the borough's 116,000 inhabitants were concentrated along the western and northern shores.

The borough's industrial development thrived along the shores of Arthur Kill and Kill Van Kull. Industrial uses along the south shore, today commonly known as South Richmond, included maritime-related businesses, produce shipment, and steel and brick manufacturers in the Tottenville and Charleston neighborhoods. S.S. White Dental Works, the largest manufacturer of dental equipment in the world, was located at Prince's Bay.

By the early 1930s, the Outerbridge Crossing, Goethals and Bayonne bridges, and a new local span over Fresh Kills, opened to improve commercial access to the island. During the Depression, and until the end of World War II, the borough's population rose slowly.

America's involvement in World War II revived port activity and manufacturing on the island. In 1946, New York City Parks Commissioner Robert Moses developed the Staten Island and West Shore Expressway and the Richmond Parkway. By the 1950s and 1960s, suburban development in the island's southern section increased rapidly as the automobile gained importance. The Verrazano Narrows Bridge, opened in 1964, further spurred population growth. While the 1970s were a period of population decline for the city's four other boroughs, Staten Island experienced continued population growth. By 1975, the City Planning Commission, recognizing the borough's rapid growth and the desire to retain its natural environments, created the Special South Richmond Development District (SSRDD) to establish land use control through zoning practices.

According to the 1980 census, the borough's population was 352,029, a gain of almost 20 percent for the decade. The 1990 census revealed the population grew by 7.7 percent to 378,977. In South Richmond's Community Districts, the population jumped 73.2 percent, from 73,300 to 129,956, between 1970 and 1990. During the 1980s and 1990s, 22,000 units were added to the island's housing stock.

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