

intersection at Miller Avenue, and a fatality occurred mid-block near Highland Park. Until recently the boulevard was very wide, with two 10-foot travel lanes and a parking lane in each direction; sidewalks are six to 10 feet wide.

Vehicles regularly used Highland Boulevard to bypass traffic on Jamaica and East New York avenues. At the community's recommendation and in consultation with this plan, DOT recently installed new five-foot Class 2 bicycle lanes with buffers in each direction on Highland Boulevard from Miller Avenue to Vermont Place. This recommendation required the removal of a travel lane in each direction between Miller Avenue and the park entrance. Traffic volumes were sufficiently low that the action did not affect traffic flow. A multi-use path is being considered from Vermont Place to Jamaica Avenue to permit cyclists to ride off street, but this requires further analysis and is still in the nascent stages of planning. (See Appendix 4 for plans.)

Findings

- There is heavy traffic moving at high speeds on Bushwick Avenue
- Bushwick Avenue is a high-accident corridor.
- Vehicles frequently cross the south sidewalk of Bushwick Avenue as they enter or exit the adjacent automotive uses or the subway yard.
- Sidewalks on the north side of Bushwick Avenue are very quiet.
- Pedestrians and cyclists have no crosswalk or other regulated means to cross the intersection of Bushwick Avenue and Highland Boulevard, which carries heavy and continuous local and entering and exiting parkway traffic.
- Traffic on Highland Boulevard does not stop for oncoming traffic at Fanchon Place.
- Traffic on Highland Boulevard merging with vehicles exiting the parkway prohibits westbound cyclists from reaching Bushwick Avenue.
- Highland Boulevard east of the parkway had excess roadbed unnecessary for vehicular use that was recently converted to Class 2 bicycle facilities.

Recommendations [Map 12]

Implement a shared-use sidewalk on Bushwick Avenue

A Class 1, shared-use sidewalk as previously described is recommended on the less-trafficked north sidewalk of Bushwick Avenue [Figure 6], which meets the aforementioned criteria for the recommendation: the street has high traffic volumes and accidents, lacks a parking lane in which cyclists may ride, and is unsafe for on-street bicycle travel. The sidewalk along the cemetery is wide and little-used.

The recommendation is based on criteria (developed for this document), which identify appropriate conditions for the implementation of a multi-use sidewalk. The criteria are:

- Shared-use sidewalks should be implemented in places where on-street travel is unsafe. Cyclists, as the operators of vehicles, should ride on the street where traffic conditions and space permit.



Figure 6: Bushwick Avenue currently and with proposed shared-use sidewalk

- The facility should be planned along corridors with low-density land uses that do not require large areas for the loading and unloading of goods or people and do not have constant loading and unloading.
- Driveways and parking lots/garages along the corridor should be minimal.
- The corridor sidewalks should have light pedestrian volumes.

The Brooklyn-Queens Greenway

- Sidewalks should be at least 15 feet wide and free of street furniture, or the street furniture should be aligned in a curbside amenity strip.
- All intersections should have wide curb cuts to provide easy bicycle access to and from the multi-use sidewalk.
- Crosswalks should be marked at all intersections to ensure safety and the continuity of the path.

Bushwick Avenue fits these criteria. The cemetery produces almost no pedestrian traffic. The tree-lined sidewalks are otherwise free of obstructions such as vendors and newspaper boxes and wide enough to accommodate a separate lane for bicycles. Driveways are infrequent.

Redesign the intersection of Bushwick Avenue and Highland Boulevard

This high-accident intersection should be reconfigured to provide safe crossings for pedestrians and cyclists. Pedestrians currently attempting to cross Highland Boulevard must negotiate traffic entering and exiting to/from the Jackie Robinson (Interboro) Parkway at a wide intersection designed to maximize vehicular flow. At a minimum, a crosswalk should be marked and the raised and paved pedestrian refuge islands should be rebuilt with pedestrian ramps.

Subject to a traffic analysis, the intersection could be dramatically reconfigured to narrow the roadbed, standardize the geometry, and

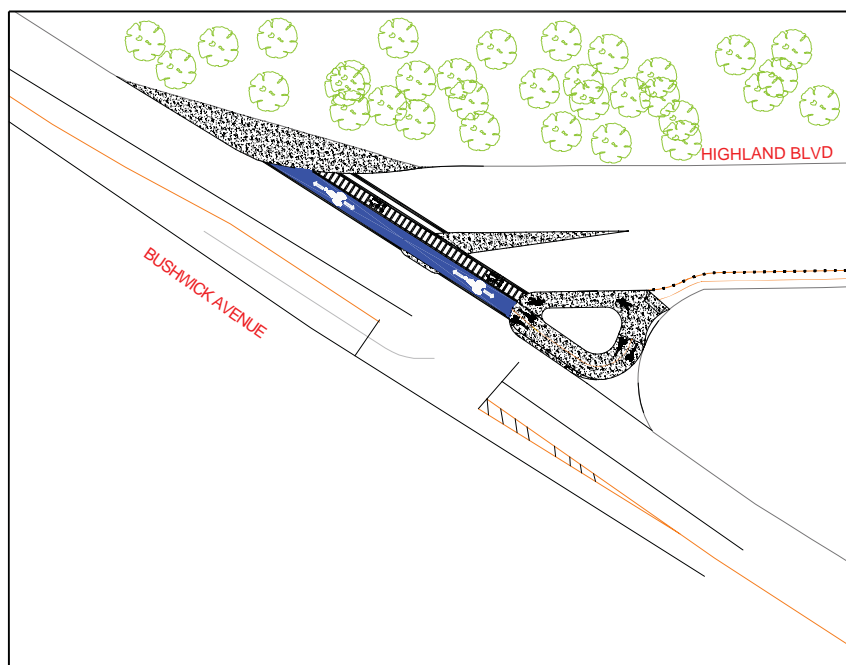


Figure 7: Redesigned Intersection at Bushwick Avenue and Highland Boulevard

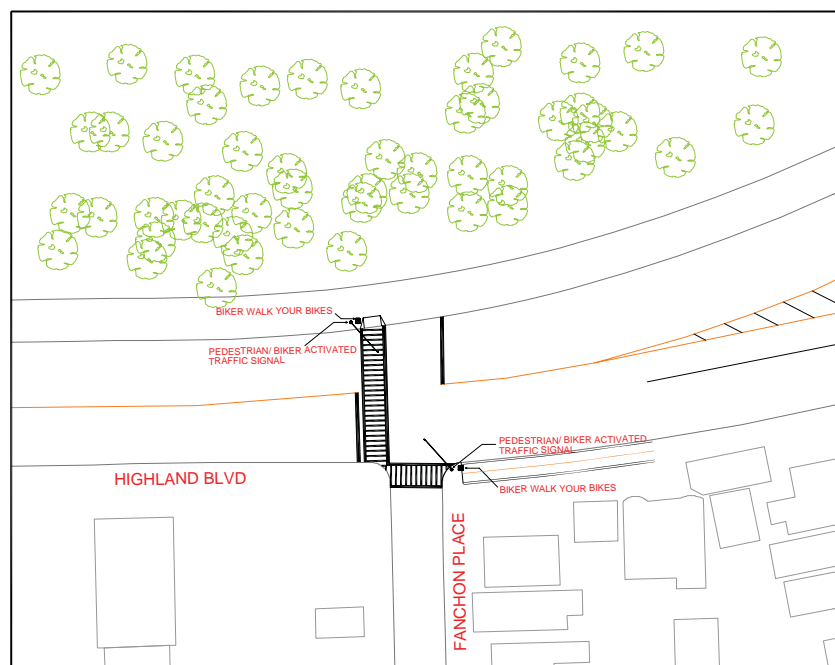


Figure 8: New Intersection at Highland Boulevard and Fanchon Place



Figure 9: Current conditions and rendering of a reconfigured Highland Boulevard with only one vehicle lane control all traffic, including right turns, at the existing traffic signal [Figure 7]. The crosswalk should be designed for pedestrians and bicyclists and pigmented blue. If necessary, right turns on red could be permitted to enhance traffic movement.

Alternatively, a new controlled intersection with an actuated traffic signal could be installed at Highland Boulevard and Fanchon Place, one block east of Bushwick Avenue [Figure 8]. The signal would remain continuously green for entering and exiting parkway traffic until activated by a pedestrian or cyclist. The crosswalk could be augmented by in-pavement flashers to further alert drivers to the crossing. Signs noting the signal would be posted on Highland Boulevard and on the parkway exit ramp.

Install a Class 1 multi-use sidewalk with a barrier on the south side of eastbound Highland Boulevard

Traffic on westbound Highland Boulevard merges with exiting parkway traffic, thereby preventing pedestrians and cyclists from safely reaching Bushwick Avenue. A Class 1 shared-use sidewalk should be implemented on the south side of eastbound Highland Boulevard as it bridges over the parkway. The existing sidewalk could be redesigned as a 10-foot wide two-way pedestrian-bicycle facility with a protective barrier. A wider facility with separate pedestrian and bicycle paths could be built by reducing eastbound Highland Boulevard from two lanes to one and recapturing excess roadbed unnecessary for vehicular travel [Figure 9]. An examination of traffic conditions indicated that the proposed action would not affect vehicular traffic, though it may affect on-street parking. Greenway users would continue on the south side of Highland Boulevard until Miller Avenue, where they would connect with the new Class 2 bicycle lanes.

SOUTHERN ROUTE

Introduction

The southern route travels for one block on Lincoln Terrace to East New York Avenue, continues east-west on Liberty Avenue, then runs on Vermont Street and Sunnyside and Miller avenues. The route avoids Atlantic Avenue, with its high traffic volumes, accidents, and transportation infrastructure – parkway on- and off-ramps, LIRR tracks, and elevated subway stations – that make cycling difficult. However, the southern route remains less than ideal. East New York Avenue has high traffic volumes and accidents, varying roadbed widths, and parking regulations that make the striping of a bicycle lane infeasible. Conditions do not permit consideration of a shared-use sidewalk. DOT plans to sign a class-3 route on the southern route because of its low cost and ease of implementation. The northern route, however, remains better for pedestrians due to its directness and residential character.

Lincoln Terrace from Buffalo Avenue to East New York Avenue

Existing Conditions

The route travels south on Lincoln Terrace for one block to East New York Avenue. The two-way street, the southerly continuation of Buffalo Avenue, is sandwiched by Lincoln Terrace Park, a major open space destination on the route. The seven-acre park features a baseball field, two playgrounds, handball courts, and recently-renovated tennis courts. Alternately, the route could travel for one block on Eastern Parkway Extension and Pitkin Avenue, an east-west street that directly links the terminus of Eastern Parkway and East New York Avenue.

Findings

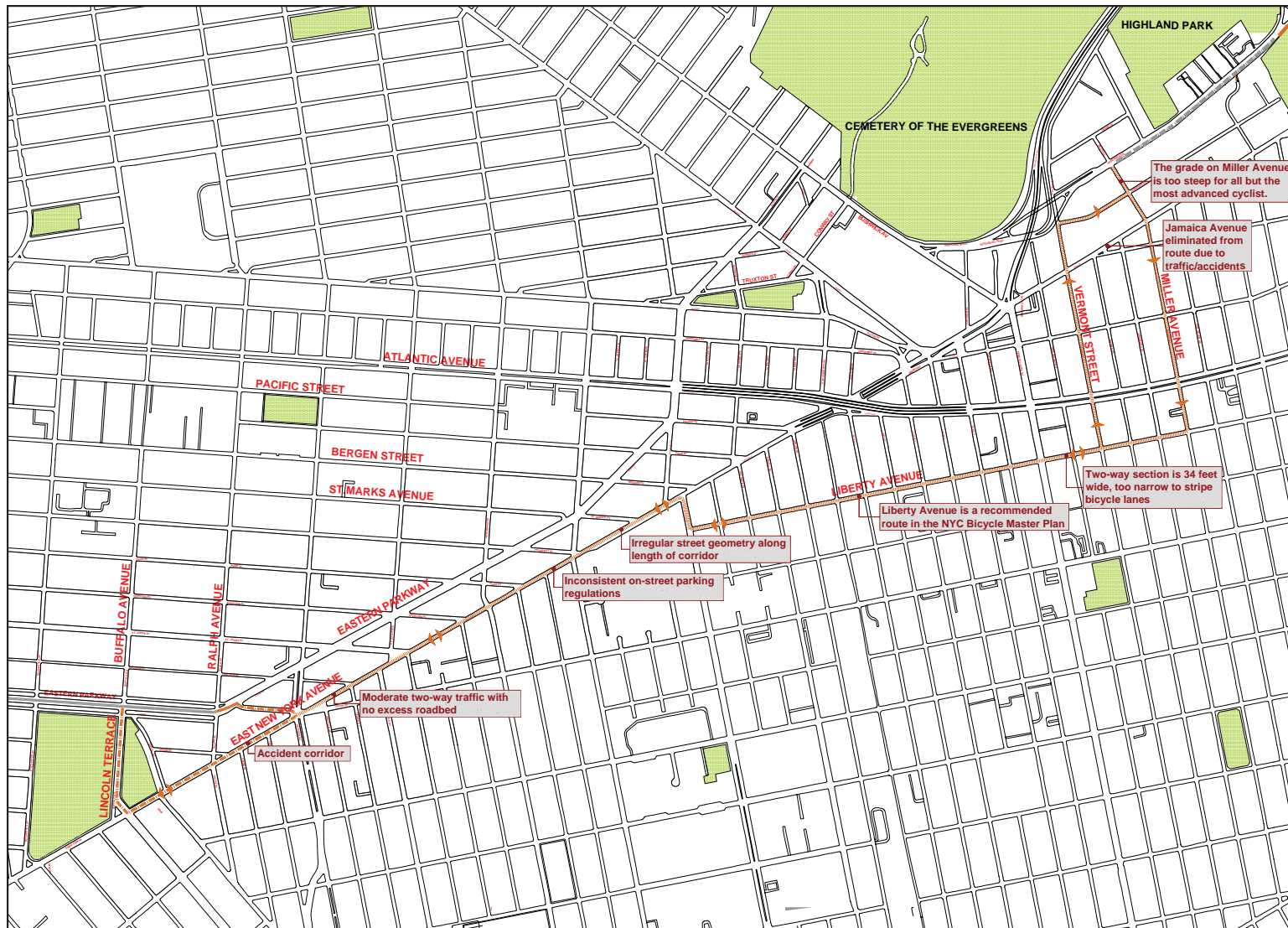
- Lincoln Terrace is a recommended route in the *NYC Bicycle Master Plan*.
- The street travels through Lincoln Terrace Park
- The street is wide and carries moderate traffic.

Recommendations [Map 13]

Stripe Class 2 bicycle lanes on Lincoln Terrace

Five-foot wide bicycle lanes should be striped in each direction and greenway signs should be installed to provide continuity between the malls and East New York Avenue.

Sign a Class 3 route on Pitkin Avenue to provide continuity between Eastern Parkway and East New York Avenue.

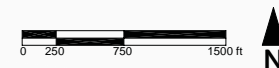


Map 13
Eastern Parkway Extension

Issues:
 Southern Route/ East New York Avenue and Liberty Avenue

-  Class 1
-  Class 2
-  Class 3
-  Class 1, Shared-Use Sidewalk

-  Existing Class 1
-  Existing Class 2
-  Existing Class 3



East New York Avenue from Lincoln Terrace to Mother Gaston Boulevard

Existing Conditions

East New York Avenue has a mix of high-density residential and commercial uses, such as auto repair shops and small delis. New York City Housing Authority (NYCHA) apartment complexes line the south side of the avenue for almost the entire corridor. There is an elevated L train subway stop to the north at East New York Avenue and Atlantic Avenue.

East New York Avenue from Lincoln Terrace to Mother Gaston Boulevard consists of one through lane and one parking lane in each direction, although the street width varies from 33 to 55 feet. Like Eastern Parkway Extension, East New York Avenue is characterized by irregular intersection geometry as it meets narrow one-way streets that run both east-west and north-south, creating a variety of junctions from T-intersections to five-legged intersections. Most intersections are signalized, and have crosswalks and pedestrian signals. Sidewalks are approximately 15 feet wide, in poor to fair condition, and are rather barren, with little street furniture or landscaping. However, the street, especially at its southwestern end, has a lot of pedestrian traffic and consequently is very lively.

East New York Avenue carries moderate to heavy traffic, but the road functions less as a cross-borough arterial street than does Eastern Parkway Extension, since much of the traffic is generated by vehicles entering and exiting the narrower one-way cross streets that intersect the avenue. Accidents are prevalent throughout the corridor, though less frequent than on Eastern Parkway Extension. East New York Avenue from Ralph Avenue to Mother Gaston Boulevard averaged 130 total and 75 reportable accidents per year, but had no fatalities [See Appendix 3: Accident Analysis]. Howard Avenue had the highest average annual total (28), reportable (15), pedestrian (2), and bicycle (1) accidents along East New York Avenue. Accidents were also frequent at Lincoln Terrace and Ralph, Rockaway, and Hopkinson avenues. Curbside parking regulations are inconsistent block to block, but either prohibit parking (or standing) or permit alternate side of the street parking [Map 10]. Parking on the sidewalk is frequent at certain locations, especially between Thomas S. Boyland Boulevard and Park Place.

Findings

- East New York Avenue north of Pitkin Avenue is insufficiently wide to stripe bicycle lanes.
- Alternate side of the street and no-parking regulations along the corridor also constrain the striping of bicycle lanes.
- Total, reportable, and pedestrian/cyclist accidents are frequent along East New York Avenue.
- Irregular intersections make crossing the street difficult for pedestrians and cyclists.
- Vacant land, especially at the northeastern end of this section, contributes to an unattractive environment along the route.
- There is heavy pedestrian traffic along the corridor despite the poor and unattractive condition of the sidewalks.
- Pedestrians are obstructed by vehicles parked on the sidewalk.

Recommendations [Map 13]

Stripe Class 2 bicycle lanes on East New York Avenue from Lincoln Terrace to Pitkin Avenue

DCP recommends the striping of Class 2 bicycle lanes on East New York Avenue where the street is 48 feet wide. The bicycle lane should be five feet wide, leaving an 11-foot travel lane and an eight-foot parking lane in each direction.

Highlight the bike lanes with pigmented asphalt

Where feasible, Class 2 lanes should be pigmented to highlight their visibility.

Mark the lane with profiled thermoplastic or rumble strips

A slightly raised material, such as profiled thermoplastic, should be used on the outside of the lane buffer to allow cyclists to move easily in and out of the lane, while providing a physical reminder to motorists.

Peg-a-track the pigmented bicycle lane through intersections

Peg-a-tracking, dashed marks that continue a bike lane through an intersection should be striped at East New York Avenue and Lincoln Terrace, Portal Street, Ralph Avenue, and Union Street. Such markings alert both drivers and pedestrians to the presence of cyclists. Changes in pavement material (from asphalt to pavers or concrete) may further define the cyclists' space.

Install advanced stop boxes or bicycle boxes

A striped bicycle lane on East New York Avenue should be accompanied by advanced stop boxes, or "bicycle boxes," at signalized intersections. Advanced stop boxes allow the cyclist to enter the intersection ahead of cars and thus minimize conflicts with turning vehicles. The bike box should be six to 10 feet wide, span the roadway, and be located behind striped crosswalks.

Sign a Class 3 route on East New York Avenue from Pitkin Avenue to Mother Gaston Boulevard

A signed route is recommended for East New York Avenue where the roadway is too narrow to stripe bicycle lanes. Standard greenway medallions should delineate the route.

Mark stop lines

Advance stop lines should be marked three to four feet from the crosswalk at all signalized intersections along East New York Avenue.

Mother Gaston Boulevard from East New York Avenue to Liberty Avenue

Liberty Avenue from Mother Gaston Boulevard to Vermont Street and Miller Avenue

Existing Conditions

The route follows Mother Gaston Boulevard for one block to connect the major streets on the route. Mother Gaston Boulevard is a two-way north-south street flanked by residential buildings, including high-rise apartment buildings to the west.

Liberty Avenue is a mix of low-rise residential buildings with commercial storefronts, automotive service stations, light manufacturing uses such as warehouses, and vacant land. The A and C subway lines stop at the Liberty Avenue station at Pennsylvania Avenue.

Liberty Avenue is 34 feet wide, with a 10-foot travel lane and a seven-foot parking lane in each direction. Intersections are both signalized and stop-controlled. Traffic is modest, with between 500 and 600 vehicles combined in the peak hour. Accidents along Liberty Street are low except at Pennsylvania Avenue; the single fatality over the five-year period occurred at Georgia Avenue [See Appendix 3: Accident Analysis].

Findings

- Mother Gaston Boulevard is two-way and sufficiently wide for bicycle travel in both directions.
- Liberty Avenue is a recommended route in the *NYC Bicycle Master Plan*
- Liberty Avenue is two-way, direct, and continuous, and traffic accidents are low, but the street is only 34 feet wide, too narrow to stripe bicycle lanes

Recommendations [Map 13]

Sign a two-way Class 3 route on both streets

Given the narrow street dimensions, standard Class 3 greenway and regulatory signs should be installed on Mother Gaston and Liberty Avenue to maintain the continuity of the route between East New York Avenue and Miller Avenue.

Vermont Street/Miller Avenue from Liberty Avenue to Sunnyside Avenue to Highland Boulevard

Existing Conditions

The route travels northbound on Vermont Street and southbound on Miller Avenue for four blocks between Liberty and Sunnyside avenues, then travels two-way on Miller Avenue to Highland Boulevard.

One-story, residential buildings line Vermont Street. A children's playground and park, Verona Playground, is located on the east side of Vermont Street near Jamaica Avenue. Vermont Street is narrow and traffic is light. From Liberty to Jamaica avenues, Vermont Street is one-way northbound, with one lane of through traffic and parking allowed on both sides of the street. North of Jamaica Avenue, Vermont Street is two-way with parking in either direction (the lanes are not marked), although the street is not any wider.

Miller Avenue is another narrow, residential street lined with three- to six-story residential buildings and light traffic. The street is only 30 feet wide, but it has a parking lane and a travel lane in each direction divided by a double yellow line. The intersection of Miller Avenue and Atlantic Avenue averaged eight reportable accidents per year.

At this point, the route follows one-way paired streets because Vermont Street does not continuously run in both directions. The eastbound route travels for one block on Sunnyside Avenue, a narrow two-way road similar to Vermont Street. One-story residential buildings line Sunnyside Avenue, which is 30 feet wide with a traffic and a parking lane in each direction. Traffic is light and slow-moving. Jamaica Avenue, parallel to and one block south of Sunnyside Avenue, has high traffic volumes and accidents.

Miller Avenue north of Sunnyside Avenue remains a narrow, two-way residential street lined with three- to six-story residential buildings and light traffic. While the street is extremely steep as it nears Highland Boulevard, discouraging most pedestrian traffic and making cycling difficult, Miller Avenue is the only street that provides a through connection between Sunnyside Avenue and Highland Boulevard. The signalized intersection of Miller Avenue and Highland Boulevard averaged eight reportable accidents per year.



Miller Avenue

Findings

- Vermont Street and Miller Avenue have light traffic and few accidents except at Atlantic Avenue.
- Vermont Street is two-way for only a portion of the route.
- Both streets are narrow, with little extra space when both lanes of parking are occupied.
- Sunnyside Avenue is quiet and residential with low traffic and few accidents, but one-way.
- Heavy traffic on Jamaica Avenue poses a potential danger for the cyclist.
- Miller Avenue connects directly to Highland Boulevard, but the grade is too steep for all but the most advanced cyclists.

Recommendations

Sign a Class 3 route on narrow residential streets [Map 13]

A Class 3 signed route is recommended along Vermont Street, Sunnyside Avenue, and Miller Avenue to maintain the continuity of the route from Liberty Avenue to Highland Boulevard. The narrow roads, despite low traffic volumes, do not permit the installation of bicycle lanes. Jamaica Avenue is not included on the route due to high traffic volumes and accidents; instead, Liberty Avenue five blocks south serves as the westbound pair. Signs with a schematic of the route should be placed on Sunnyside and Liberty avenues. Caution signs as per the Manual for Uniform Traffic Control Devices should be implemented near playgrounds that abut the route. Signs on Miller Avenue should warn of the steep grade and advise riders to walk their bikes.

Highland Boulevard from Miller Avenue to Highland Park

The northern and southern routes merge on Highland Boulevard, where Class 2 pigmented bicycle lanes are recommended.

CONNECTIONS TO EXISTING AND PROPOSED ROUTES

Introduction

This third route is less direct than the other routes, but uses streets recommended in the *NYC Bicycle Master Plan* to avoid high-traffic streets and the transportation infrastructure at Broadway Junction. The route travels from Eastern Parkway north-south on Buffalo and Ralph avenues to connect with eastbound St. Marks Avenue and westbound Bergen and Pacific streets, where Class 2 bicycle lanes have been striped recently. The route then connects with either the northern route at Eastern Parkway Extension or the southern route at East New York Avenue.

Buffalo and Ralph avenues from Eastern Parkway to St. Marks Avenue and Pacific Street

Existing Conditions

Land use surrounding Buffalo and Ralph avenues is primarily residential, with a high proportion of one and two-family homes and mixed residential and commercial buildings interspersed with vacant lots. Retail activity is light and limited to restaurants and bodegas. There are several churches located on the streets.

Buffalo and Ralph avenues are two-way northbound and southbound streets carrying moderate vehicular and pedestrian traffic. Buffalo Avenue is 37 feet wide, with a travel and a parking lane in each direction, and carries bi-directional traffic of 500-600 vehicles in the peak hours. At Bergen Street Buffalo Avenue terminates, interrupted by Kingsborough Houses, then resumes at Pacific Street. Ralph Avenue is 34 feet wide with a moving lane and a parking lane in each direction. Alternate side of the street parking regulations obtain. Intersections on both avenues are primarily stop-controlled. Traffic accidents are generally low. Buffalo Avenue at St. Johns Place and Ralph Avenue at Sterling Place had the highest number of reportable accidents per year (eight).

Findings

- Buffalo and Ralph avenues provide a direct link between the malls of Eastern Parkway and recently-striped bicycle lanes on east-west streets to the north. However, Buffalo Avenue is discontinuous.
- Both streets are two-way but narrow, with moderate traffic.



Bike lane on Bergen Street near Howard Avenue