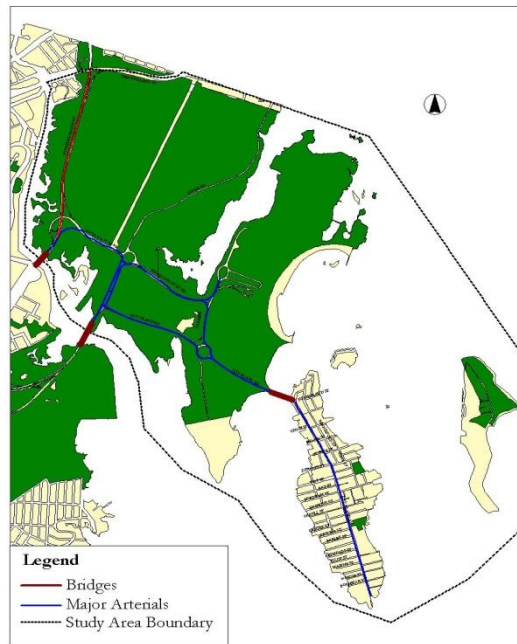


# City Island Transportation Study



## Final Summary Report



Michael R. Bloomberg  
Mayor



Janette Sadik-Khan  
Commissioner



A Member of the New York  
Metropolitan Transportation Council

September 2011

## **City Island Transportation Study**

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Prepared by:

New York City Department of Transportation

Janette Sadik-Khan, Commissioner

Lori Ardito, First Deputy Commissioner

Gerard Soffian, P.E., Deputy Commissioner

Ryan Russo, Assistant Commissioner

Connie Moran, Bronx Borough Commissioner

Naim Rasheed, Project Director

Michael Griffith, Deputy Project Director

Milorad Ubiparip, Project Manager

Carren Simpson, Highway Transportation Specialist

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## **Executive Summary**

The City Island Transportation Study was initiated to address the existing and future travel demands generated by the residential, commercial and recreational land uses in the study area, which includes entire City Island, Orchard Beach and the northern parts of Pelham Bay Park during the summer and non-summer conditions.

The analysis of the area's existing and future traffic conditions identified locations for improvement. During the peak summer months when vehicular volumes far exceed the norm on the island, a variety of factors such as limited access, roadway capacity, traffic controls, public transportation provision, and parking availability (on-street and off-street) contributed to queuing and congestion not only on City Island but also over the bridge, on the roadways and in the park.

The improvement measures focused mainly on roadway design, crosswalk and sidewalk, roundabout modifications, bus stop relocations, signals/traffic controls, sign and pavement markings. The following locations were indentified for improvement:

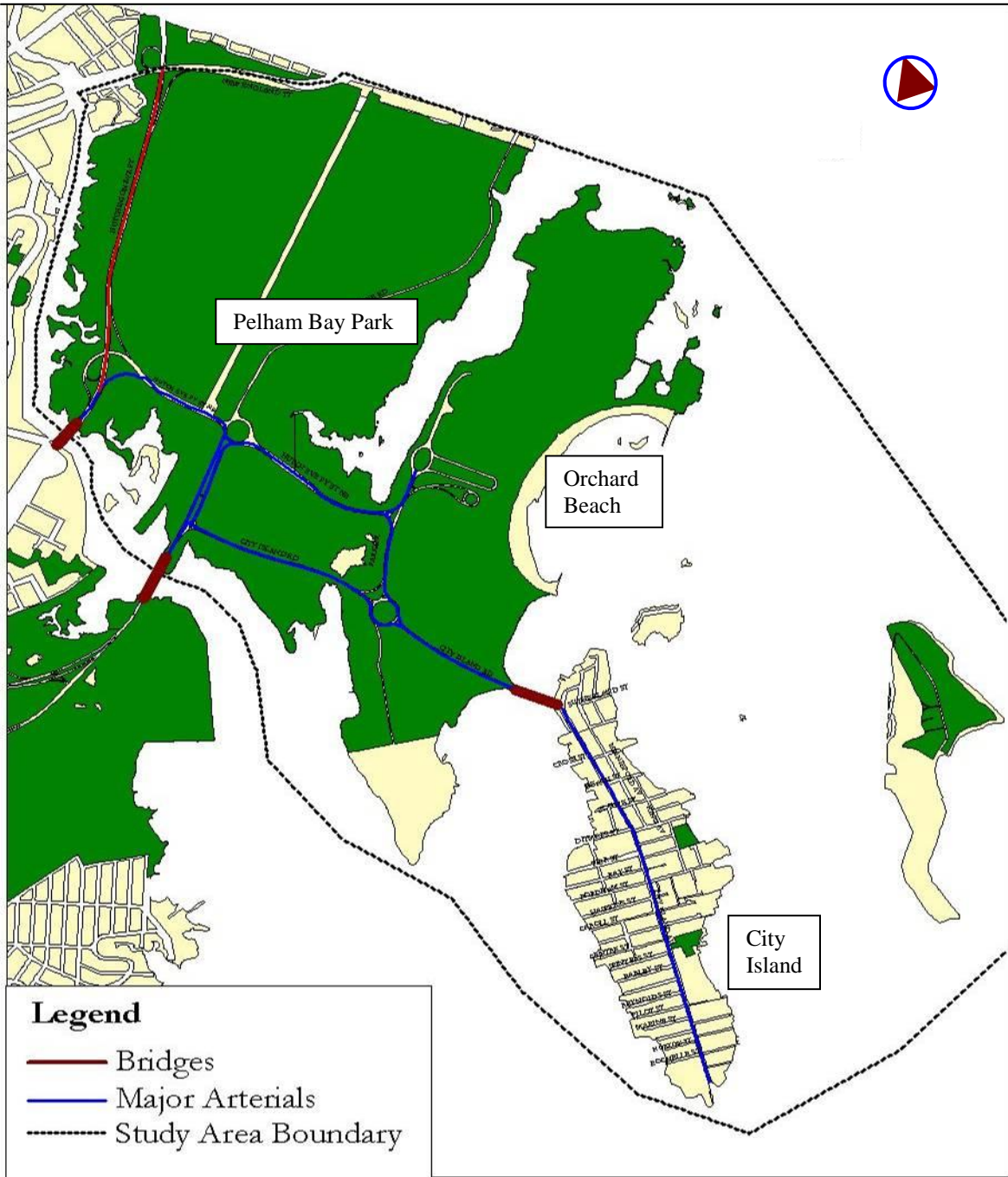
1. City Island Avenue and Bridge Street (roadway restriping, creation of exclusive left turn lane, pedestrians and bicyclists improvements);
2. City Island Avenue between Bridge Street and Cross Street (creation of exclusive right turn lanes, parking removal, bus stop relocation, and signal timing change);
3. City Island Avenue and Winters Street (bus stop relocation);
4. City Island Avenue and Belden Point (truck loading/unloading zones, stop signs installment, and traffic enforcement);
5. City Island Road and Shore Road (roadway restriping, islands channelization, crosswalks, and signal timing changes);
6. Park Drive and Orchard Beach Drive (redesign intersection and new Class I bike lanes);
7. City Island Road and Park Drive / Roundabout 1 (inner roadway restriping, roadway widening, bus stop relocation, Yield signs replacement); and
8. Shore Road and Park Drives / Roundabout 2 (safe pedestrian, bicyclist and horse riding crossings, inner roadway restriping, and signs and markings).

## **Introduction**

City Island is an important regional recreational and entertainment attraction with seafood restaurants and marinas. City Island has approximately 5,000 residents in low-density residential units. City Island Avenue, the main street, runs the length of the island from City Island Bridge to Belden Point in the south. This main street has one moving lane and a parking lane in each direction, with a striped “Fire Lane” (center lane). During the summer months many visitors converge on the island to enjoy the seafood restaurants and marinas. This results in severe traffic congestion due to limited access and parking spaces.

The study area is located in the south/east section of the Bronx and north of Queens between Eastchester Bay and the Long Island Sound and is bounded by Westchester/Bronx County borderline to the north, Eastchester Bay to the south, Long Island Sound to the east, and Hutchinson Parkway/New England Thruway to the west. The study area includes the entire City Island, Orchard Beach, and parts of the northern section of Pelham Bay Park. The 230-acre island is about a mile-and-a-half long and a half-mile wide at its widest point and is connected to the mainland at Rodman’s Neck by City Island Avenue Causeway. Figure 9-1 shows the study area boundaries.

**Figure 9-1: Study Area**



## **Existing and Future Conditions with Recommendations**

### **Existing Conditions**

The existing conditions analysis examined demographics, land use and zoning, traffic, parking, pedestrians and bicycles, goods movement, accident/safety and transit in the study area. The traffic analysis focused on nine intersections and three roundabouts in the park. The analysis utilized the Highway Capacity Manual (HCM) and SYDRA methodologies to calculate levels of service (LOS) for the study area intersections and roundabouts. Under the various summer and non-summer peak hours, the HCS results show unrealistic values (see Appendix) with very low v/c ratios, delays and acceptable levels of service (LOS C or better) that did not reflect the real conditions. Field observations during the summer period showed City Island Road/Avenue as heavily congested with long queues over the bridge and on the roadways to the park, due to excess demand from the roundabout (No.1) to Bridge Street, the first (unsignalized) intersection on the island, even though the cross streets volumes were very low. The problem is primarily lane capacity along the approaches to the island.

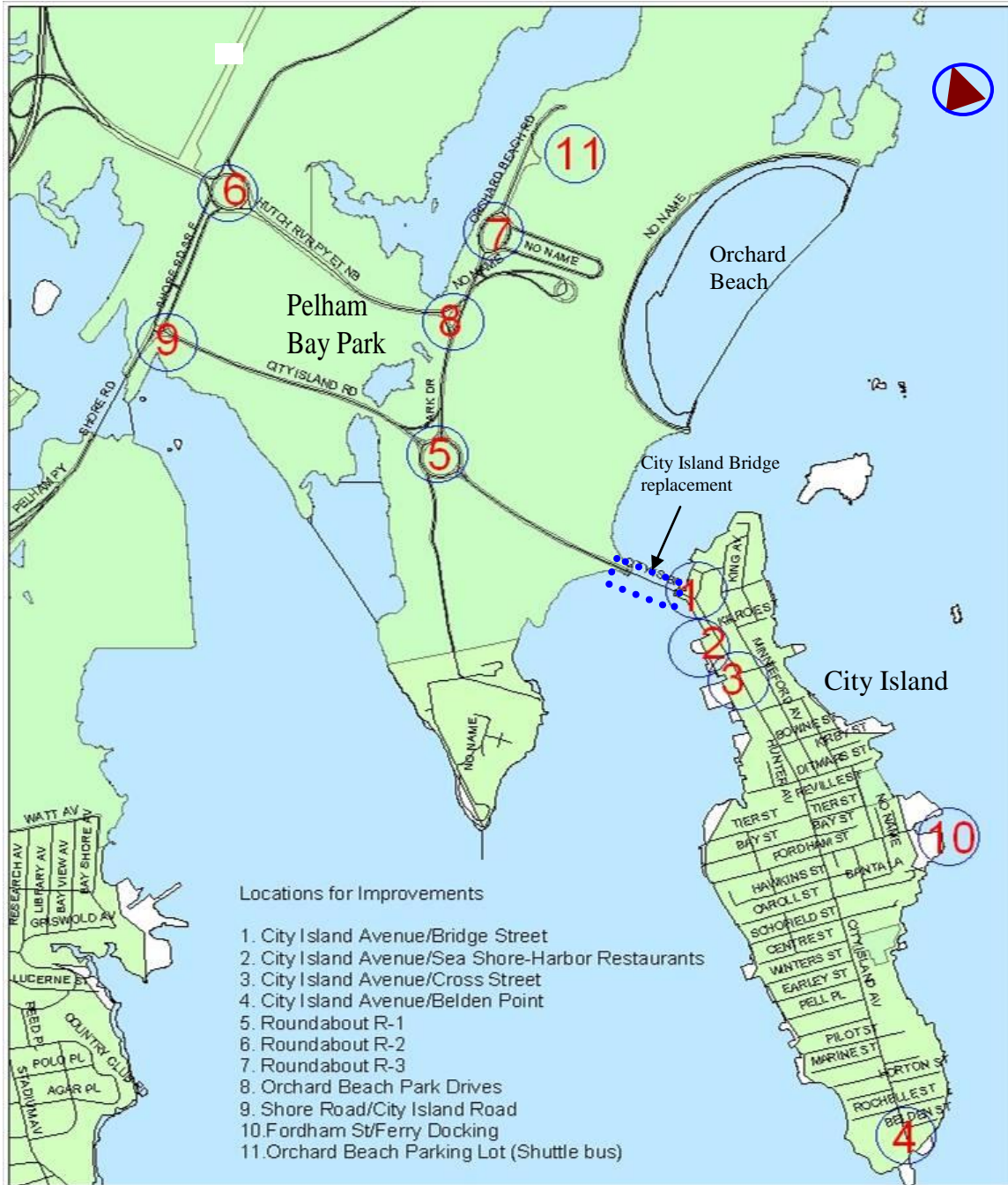
### **Future Conditions**

To derive future condition volumes, the existing condition volume was projected using a 1% per year growth. The future traffic condition analysis used the same Highway Capacity Manual (HCM) and SYDRA methodologies to calculate levels of service (LOS) for the nine study area intersections and three roundabouts. However, the HCS capacity analysis for City Island Avenue and the three traffic circles (roundabouts) provided unrealistic values, showing very low v/c ratios, delays and acceptable LOS (see Appendix). Under the future condition, it is projected that congestion and queuing will continue to be present along City Island Avenue and over the bridge and on the roadways to the park similar to the existing condition, especially during the summer evening hours.

### **Recommendations**

Based on the analyses of the existing and future conditions, field observations and community concerns, the study recommends several improvement measures to address traffic congestion, parking shortfall, and overall safety and mobility of pedestrians/bicyclists and vehicular traffic in the study area. Figure 9-2 shows eleven locations for improvement measures in the study area.

**Figure 9-2: Locations of improvement measures**





## 1. City Island Avenue and Bridge Street

The intersection of City Island Avenue and Bridge Street has a triangle median with the monument in the center and one lane on each approach. The City Island Avenue southbound approach (from the bridge/park) has only one moving lane, however south-eastbound vehicles making left turns to Bridge Street cause traffic to backup over the bridge to the park.

The following improvements are recommended to address queuing over the bridge during the peak summer months (see Figure 9-3).

- a. Restripe roadway along City Island Avenue just south of City Island Bridge to create two lanes – one left and one through. Move centerline east approximately 10 feet in order to create a left turn bay of approximately 60 feet for vehicles making left turns onto Bridge Street.
- b. Restripe northbound City Island Avenue approaching Bridge Street to create two lanes - one thru (12') and one right (14') for turns onto Bridge Street.
- c. Relocate northbound Bx29 bus stop adjacent to Bridge Street approximately 100 feet south.
- d. Create a five-foot pedestrian path on the east side of City Island Avenue and the west side of Bridge Street for approximately 200 feet from the existing/proposed bridge to King Avenue. Install one pedestrian crosswalk and two ADA ramps to connect the pedestrian passageway to the island with monument. Install a Stop bar prior the crosswalk.
- e. Prohibit westbound Bridge Street traffic from making southbound left onto City Island Avenue and create a 15 feet northbound thru lane. This will divert the same traffic to Minnieford Avenue southbound to Cross/Ditmars Streets and City Island Avenue.
- f. Install signage prohibiting southbound left turns from Bridge Street to City Island Avenue and direct southbound traffic to Minnieford Avenue.
- g. As part of DOT's (Division of Bridges) capital project, replacement of City Island Road Bridge, the following improvements are proposed: Development of Esplanade, relocation of monument, and expansion of island (See Appendix).

The aerial photos below show the existing roadway configuration of the City Island Avenue and Bridge Street intersection and diverted traffic along Minnieford Avenue from Bridge Street.

### City Island Avenue and Bridge Street



### Diverted Traffic along Minnieford Avenue from Bridge Street

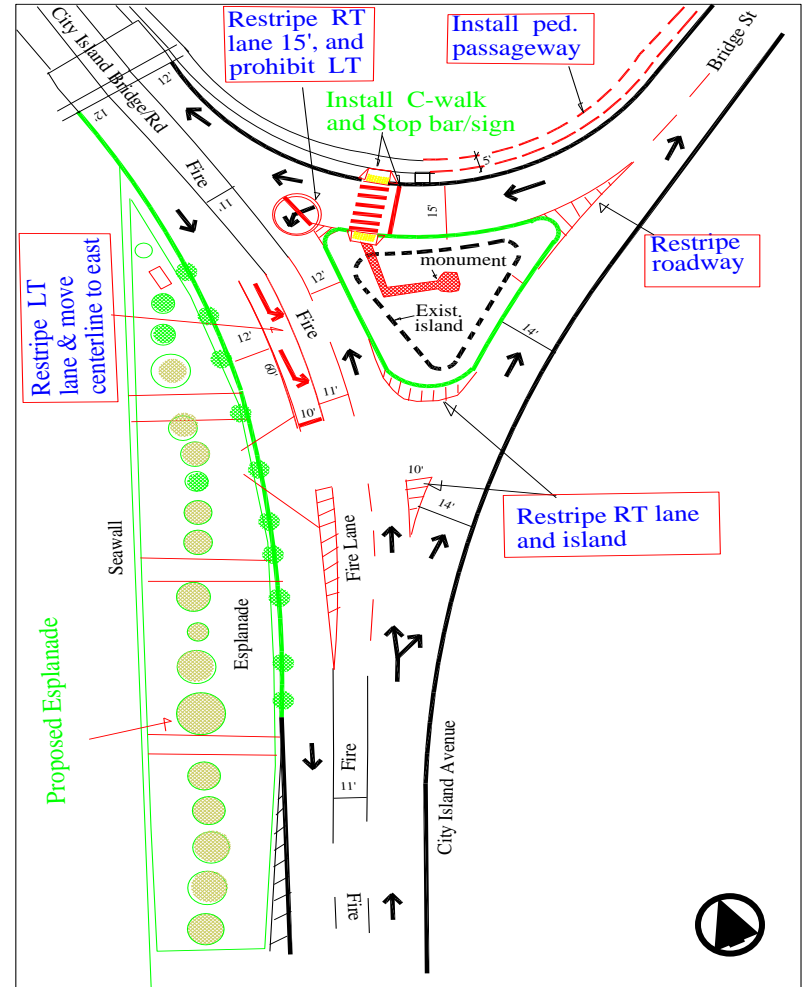
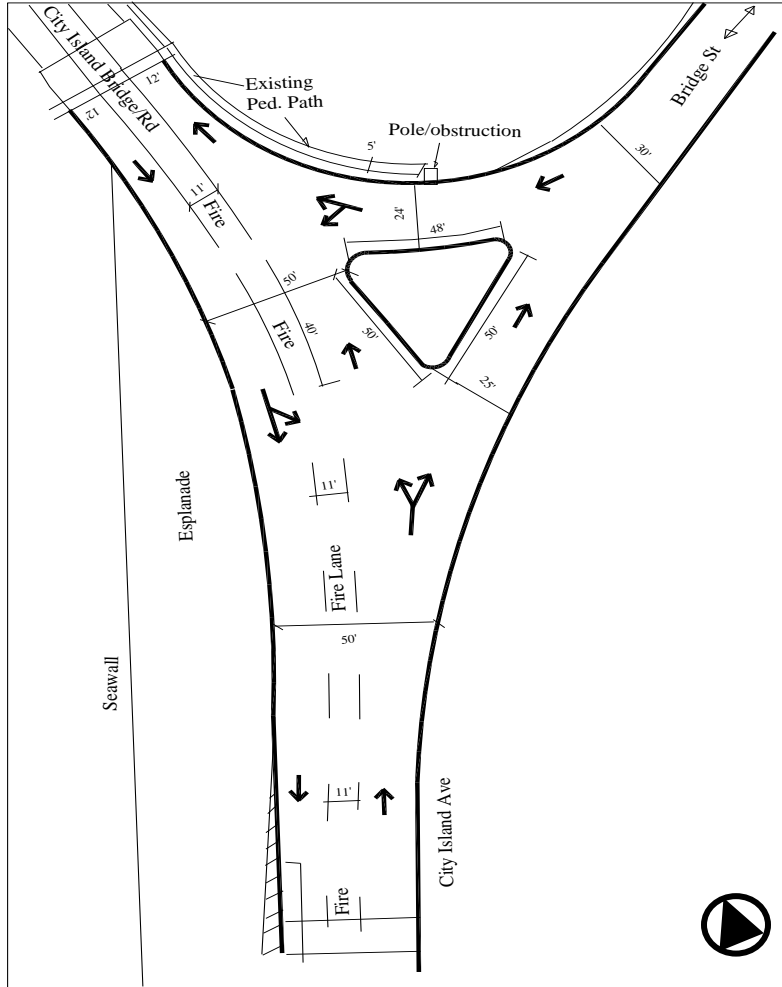


**Figure 9-3: Improvements at City Island Avenue and Bridge Street**

**Existing Condition**

**Proposed Condition**

The proposed condition incorporates some of the recommendations from DOT (Bridges) and Gandhi Engineering.

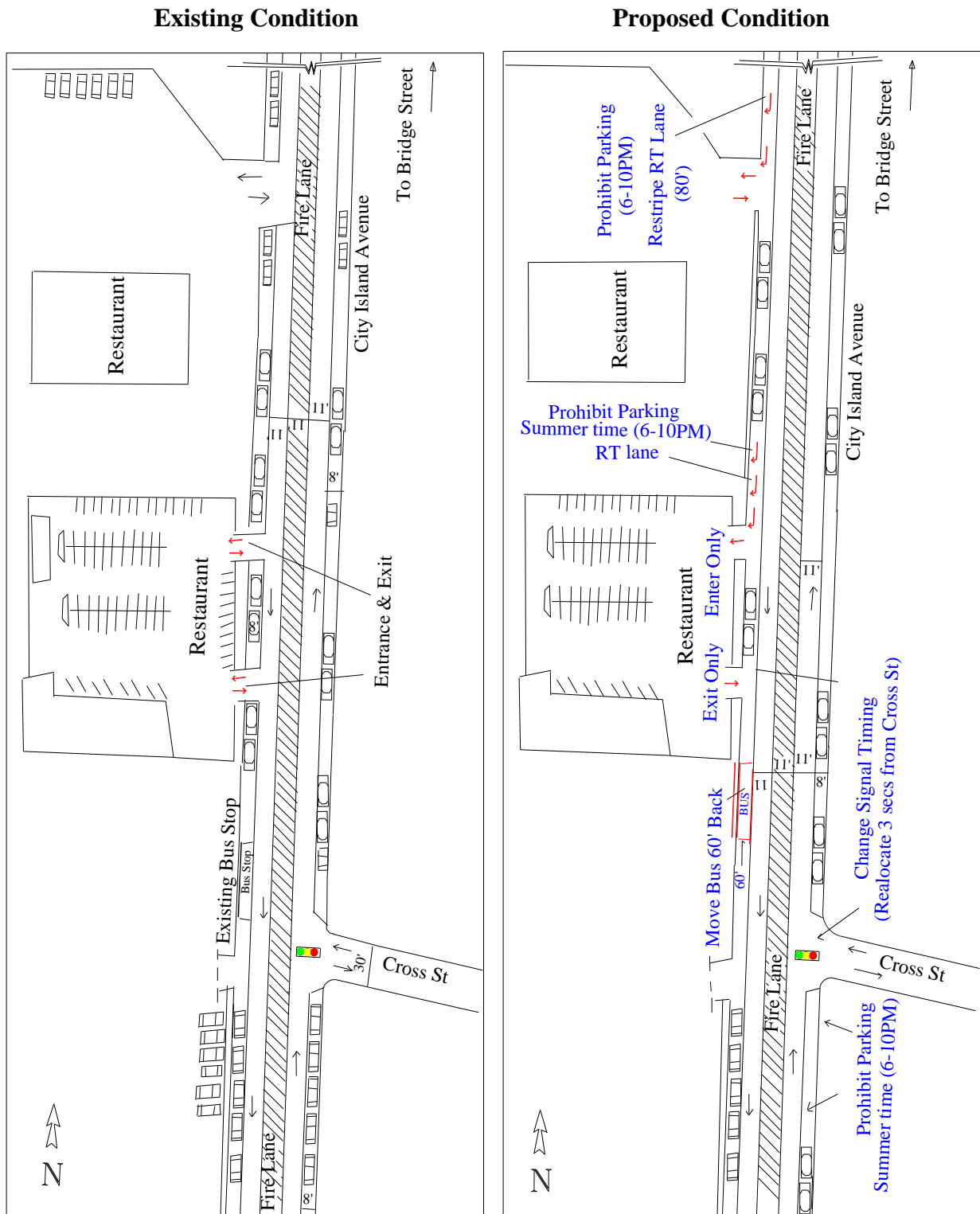


## **2. City Island Avenue between Bridge and Cross Street**

During the summer peak hours (6-10 PM), queuing is prevalent over the bridge to the park and along City Island Avenue, between Bridge and Cross Streets, due to heavy demand and vehicular ins and outs from the restaurants parking lots. The recommended improvements are shown in Figure 9-4 and listed below:

- a. Relocate the southbound Bx29 bus stop farther north for approximately 100 feet from the first restaurant's entrance.
- b. During the summer months there is a constant interruption of through traffic flow due to many ins and outs from the restaurant parking lots. Prohibit parking on the west curb of City Island Avenue between Cross Street and restaurants entrances and exits during the summer peak period and install "No Parking 6PM-10PM Fri-Sun" signs. Create an exclusive right turn lane (approximately 100 feet) on southbound City Island Avenue, to the restaurant entrance for those right turning vehicles into the parking lot.
- c. Coordinate with NYPD to enforce regulations against double and illegal parking on the west side of City Island Avenue, in the bus stop and blocking driveways to restaurant parking lots. Relocate bus stop on the west curb farther north (60') from the Cross Street/City Island Avenue intersection to improve operations.
- d. The restaurant, north of Cross Street, has two entrances/exits (curb cuts) that create conflicts as vehicles enter and exit the parking lot onto City island Avenue. To improve operations, the north curb cut should be "in" (enter) only and the south curb cut "out" (exit) only. This requires discussion with Restaurant owners.
- e. Adjust signal timing by adding three seconds of green time to the City Island Avenue northbound/southbound approaches from the Cross Street westbound approach during all the times.

**Figure 9-4: Improvements along City Island Avenue between Cross and Bridge Streets**



### **3. City Island Avenue and Winters Street**

Relocate the southbound near side bus stop to the far side to facilitate vehicular movements to and from the local parking lot.

### **4. City Island Avenue at Belden Point**


Traffic congestion and queuing at Belden Point (the southern tip of City Island) is due mainly to limited roadway capacity (one lane per direction), and vehicular ins and outs from off-street parking facilities.

To relieve congestion, queuing and parking shortages at Belden Point, the following improvement measures are recommended:

- a. Increase traffic enforcement during the summer evening rush hours (6PM-10 PM).
- b. Explore the potential use of the parking lots located on the west side of the island between Rochelle Street and Belden Point with capacities of 106 and 33 parking spaces for regular parking.
- c. Install stop signs on City Island Avenue at Rochelle Street mainly for through vehicular traffic to allow bus (Bx29) to make a complete U-Turn.
- d. Provide truck loading/unloading zones (about 80 feet) near the restaurants/commercial facilities at Belden Point and install signs for truck loading/unloading activities (10AM to 4 PM). Figure 9-5 shows locations at Belden Point proposed for loading/unloading zones.

Figure 9-5: Proposed truck loading/unloading zones at Belden Point



 Proposed loading/unloading zone

## 5. City Island Road and Shore Road

The intersection of City Island Road and Shore Road form a T-intersection with north-southbound Shore Roads consisting of two closely-spaced roadways intersected by City Island Road (westbound). The intersection is usually congested during the summer months due to heavy left turns from westbound City Island Road to southbound Shore Road, also from southbound Shore Road to eastbound City Island Road. Also, the intersection had the highest number of accidents in the study area (involving ‘left-turn’, ‘right-angle’, ‘rear end’, and ‘overtaking’ accidents).

The following improvement measures were recommended and the geometric changes were implemented, however signal timing change is still to be made.

- a. Restripe five crosswalks and further channelize the three islands at the intersection to provide a safer environment for all pedestrian and non-motorized users (implemented in October 2009). Figure 9-6 shows the old configuration and recent improvements for the intersection of Shore Road/Pelham Parkway and City Island Road. The hatched area shows the new striping, islands channelization and recently upgraded crosswalks as recommended.
- b. Implement signal timing plan for the summer peak months vs. non-summer to accommodate heavy vehicular demands. The new summer signal timing plan will include three phases with 90 seconds cycle compared to the existing plan with two phases and 60 seconds cycle.

### **Existing Signal Timing Plan**

Cycle length = 60 seconds

City Island Road WB = 25 seconds

Shore Road SB/NB = 25 seconds

Each phase includes 3 seconds of

Yellow and 2 seconds of All-Red.

### **Proposed Summer (Seasonal) Signal Timing Plan**

Cycle length = 90 seconds

City Island Road WB = 35 seconds

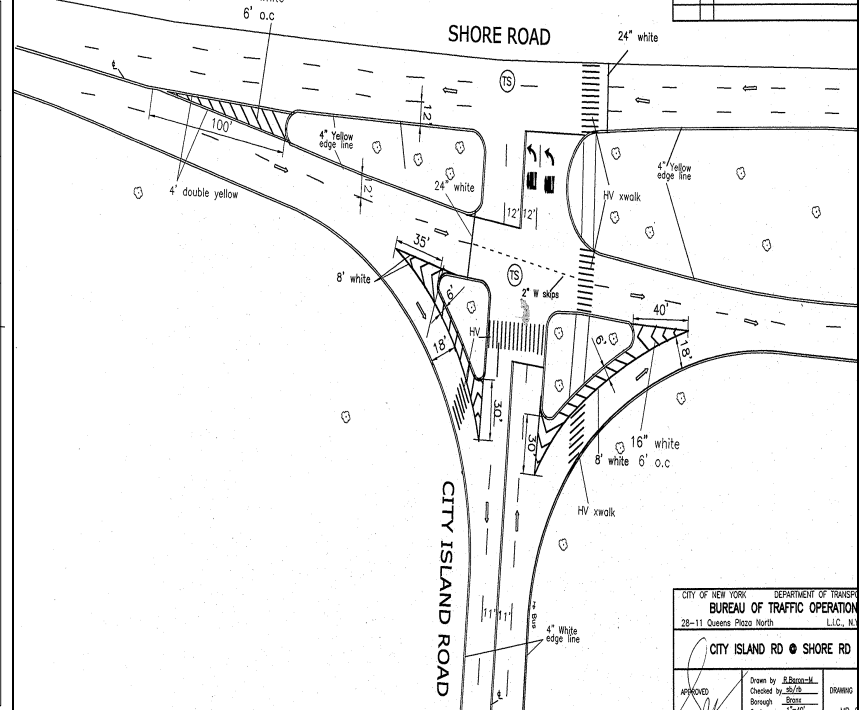
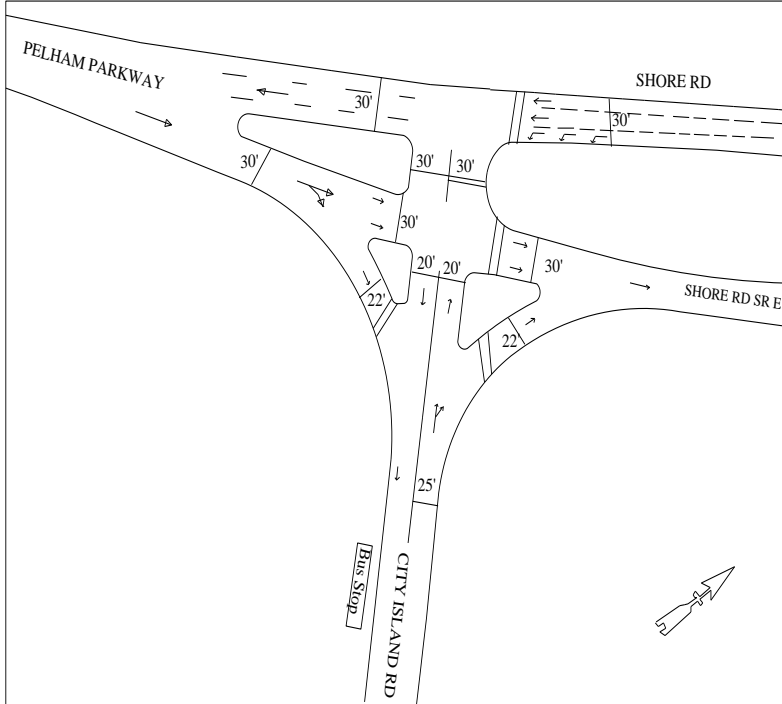
Shore Road SB = 18 seconds

Shore Road SB/NB = 22 seconds

Each phase includes 3 seconds of Yellow and 2 seconds of All-Red.



**Figure 9-6: City Island Road and Shore Road/Pelham Parkway Intersection**  
**Existing Condition** **Recent Improvements**



CITY OF NEW YORK DEPARTMENT OF TRANSPORTATION  
 BUREAU OF TRAFFIC OPERATION  
 28-11 Queens Plaza North L.I.C., N.Y.  
 CITY ISLAND RD @ SHORE RD  
 Drawn by: J. B. [unclear]  
 Checked by: [unclear]  
 Borough: [unclear]  
 Date: [unclear]

**Existing Signal Timing Plan**  
 Cycle = 60 secs

Phase 1 = 30 secs  

 Phase 2 = 30 secs

Note: Each phase includes Y+R=3.6+1.8 secs.

**Proposed (Summer) Signal Timing Plan**  
 Cycle = 90 secs.

EB/WB Phase 1 (22 secs)  
 WB/SB T Phase 2 (18 secs)  
 NB L Phase 3 (35 secs)

Note: Each phase includes Y+R = 3+2 secs.

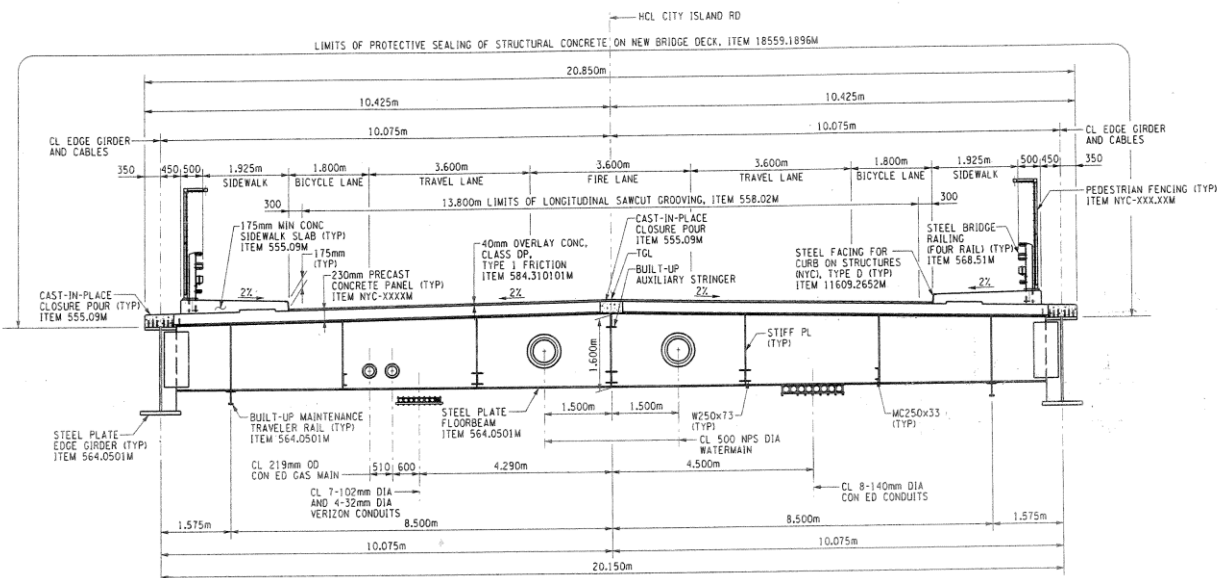
## Replacement of City Island Bridge

The New York City Department of Transportation (NYC DOT) is proposing to replace the City Island Bridge with a state-of-the-art Cable Stayed Bridge on the same alignment of the old bridge. The new mast-type Cable Stayed Bridge will be constructed with a single tower on the mainland side as is shown in the picture below.



Proposed Cable Stayed Bridge

The new bridge will have one 11-foot lane to carry traffic in each direction as well as one emergency lane. The bridge will be wider by approximately 20 feet than the existing bridge and will include features such as standard lane widths and new bike/pedestrian lanes. The drawing below shows the proposed bridge cross section.



Typical Cross Section

Source: Gandhi Engineering

The photos below show the existing City Island Road Bridge.



City Island Road Bridge, looking west



City Island Road Bridge, looking north

### Roundabouts

The proposed improvements include striping, bus stop relocation, pavement markings, and installation of informational/advisory signs. These will improve safety of vehicular and pedestrian traffic in and around the roundabout and/on the adjacent park drives.

The following aerial photo shows three roundabouts R1, R2, and R3 corresponding to locations 5, 6, and 7 in Figure 9-2.



Problems were identified with the operation of two roundabouts and general improvement measures were developed for R1 and R2:

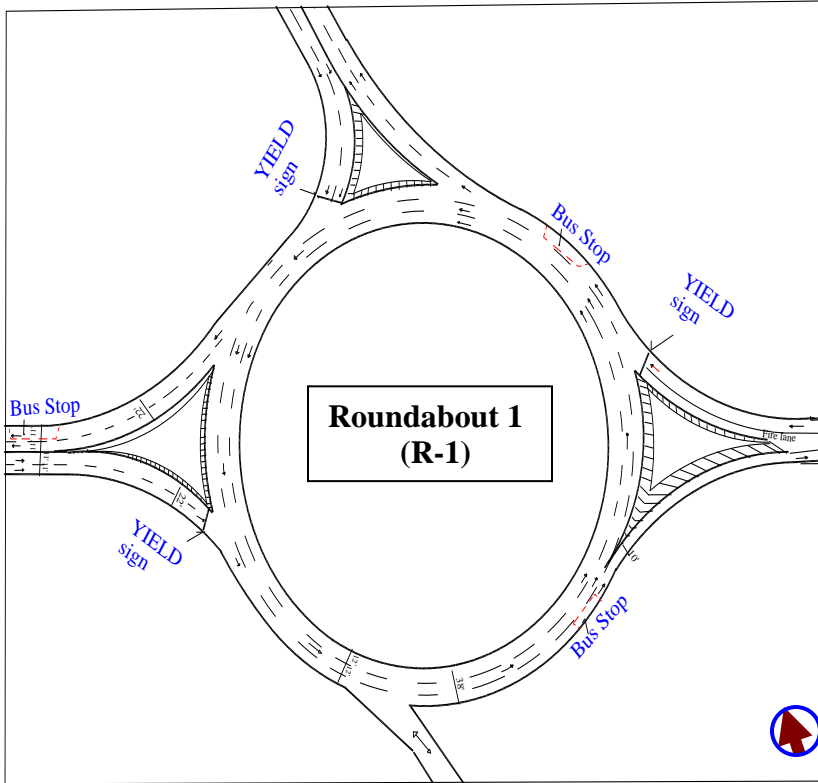
- a. Restripe circular roadway to clearly delineate the two through inner lanes and the shared through-right (outer) lane for all three Roundabouts.
- b. Install pavement markings/arrows to improve maneuverability through each roundabout and to minimize weaving.

### **Roundabout R-1**

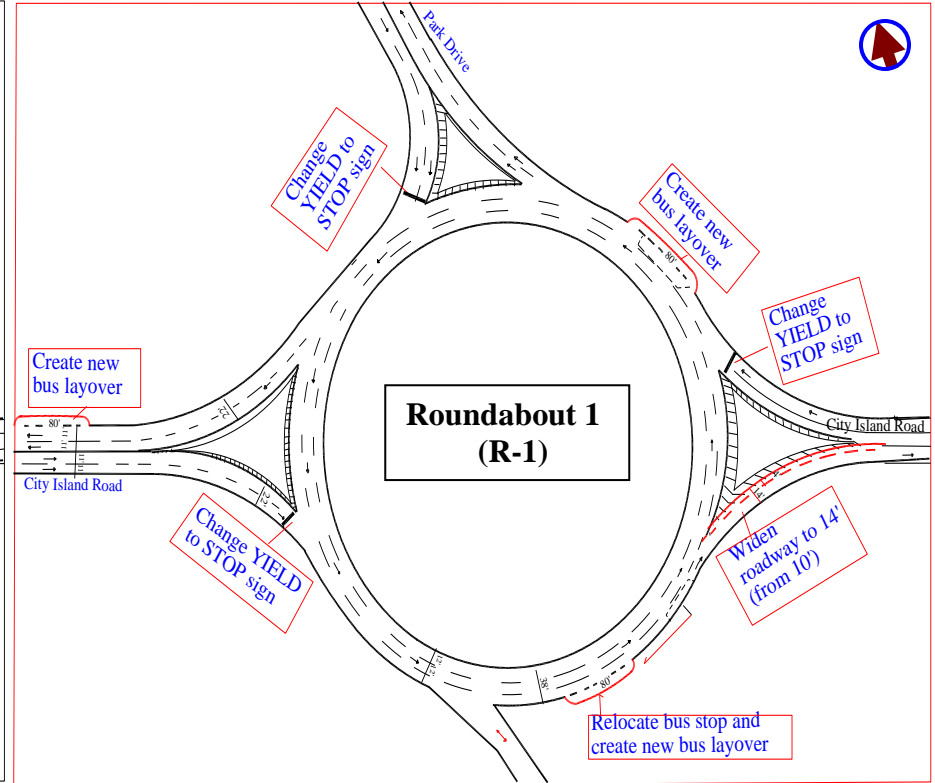
- a. Restripe City Island Road (exiting circle EB towards City Island) to one moving lane (14 feet wide).
- b. Replace the existing 'Yield' signs with 'Stop' signs at Roundabout (R-1) as currently exists at Roundabout 2.
- c. Relocate the southeast bus stop farther west and create bus layover at the southwest, northwest, and northeast corners of Roundabout 1. The Bx29 bus and two seasonal (summer) buses (Bx5 and Bx12) stop here regularly to pick-up and discharge passengers. At the current locations, buses at the bus stop blocks vehicles exiting the roundabout, therefore, relocation of the bus stops will improve safety by reducing the conflicts between buses and vehicles. Figure 9-7 shows improvements for Roundabout 1.

**Figure 9-7: Improvements for Roundabout 1  
City Island Road and Park Drives**

**Existing Condition**



**Proposed Condition**



### **Roundabout R-2**

- a. Restripe the southbound approach of North Shore Road to create one thru-right lane.
- b. Restripe the westbound approach of Orchard Beach Park Drive to create two moving lanes and move STOP bar closer to the circle.
- c. Restripe the four median islands (as shown in Figure 9-8) to create two moving lanes.
- d. Upgrade pedestrian and bicycle crossing on the west side of the circle.
- e. Widen the existing crossing and horse path to provide safe crossing for horseback riders on the west side of the roundabout, and post signs warning motorists to slow down for horse crossing.
- f. Install a new two-way bike lane Class I (5' each) in the park, next to the circle, and bike crossings on the north and the west side approaches to connect Orchard Beach to Westchester and the Bronx.

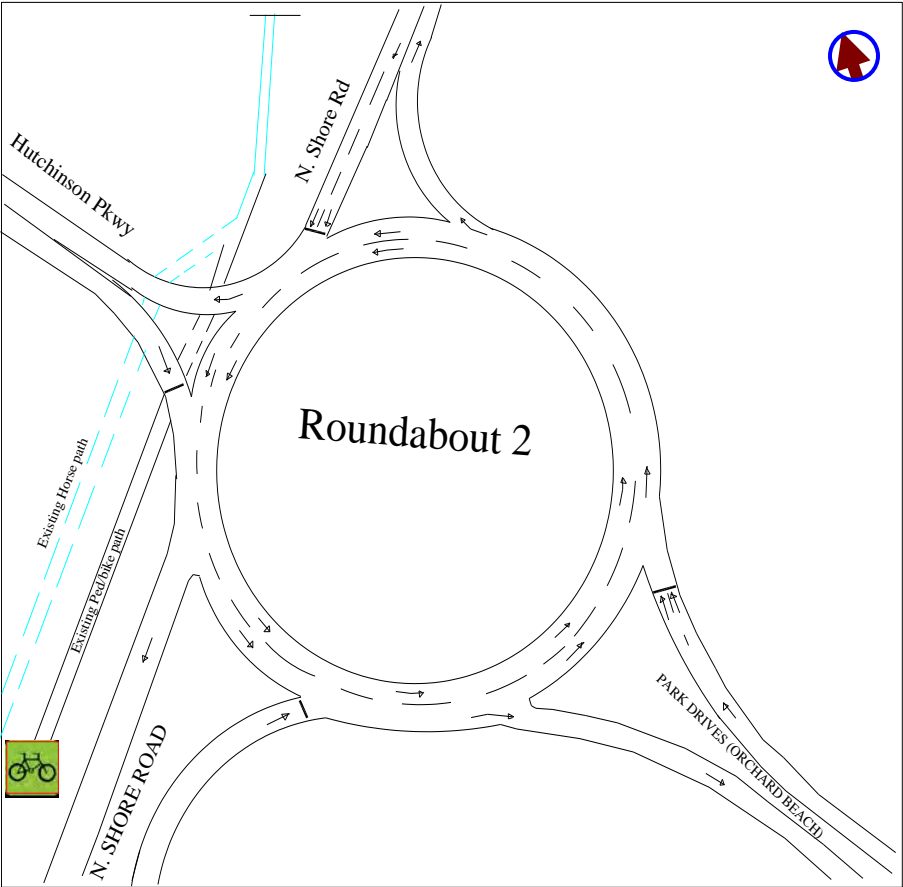
Figure 9-8 shows improvements for Roundabout 2 (R-2).

### **Roundabout R-3**

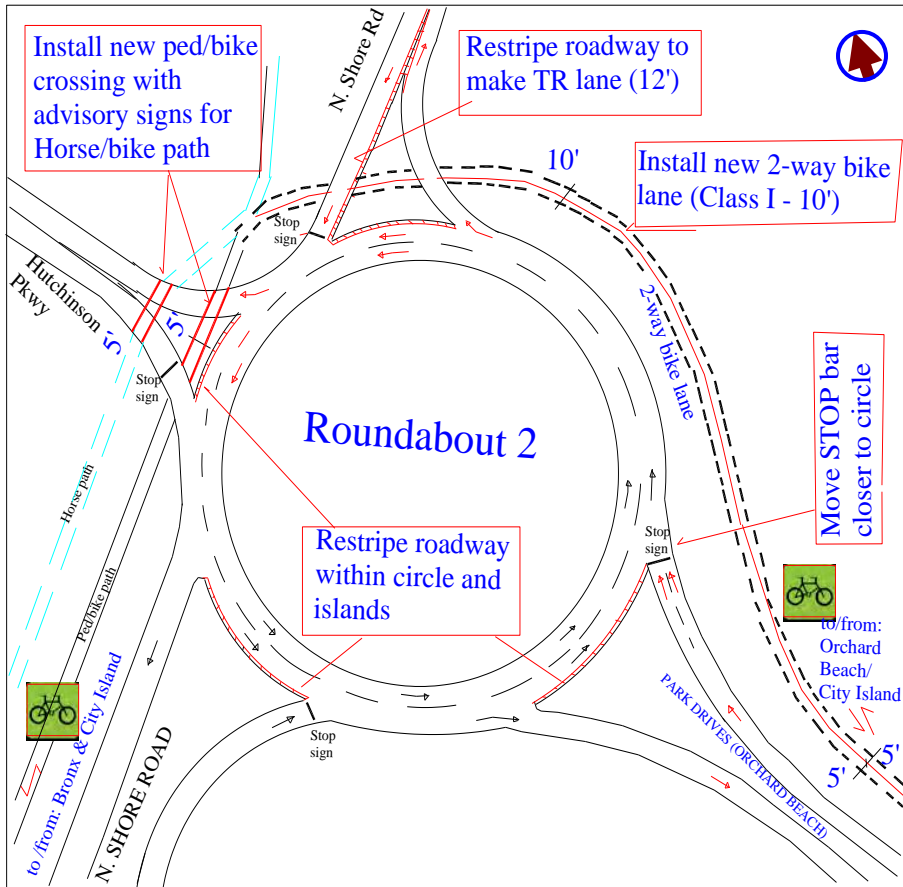
No improvement measures are recommended for this location as it operates optimally.

**Figure 9-8: Proposed Improvements for Roundabout 2  
Shore Road/Orchard Beach Drive and Hutchinson Parkway**

**Existing Condition**



**Future Condition**



## **Park Drives**

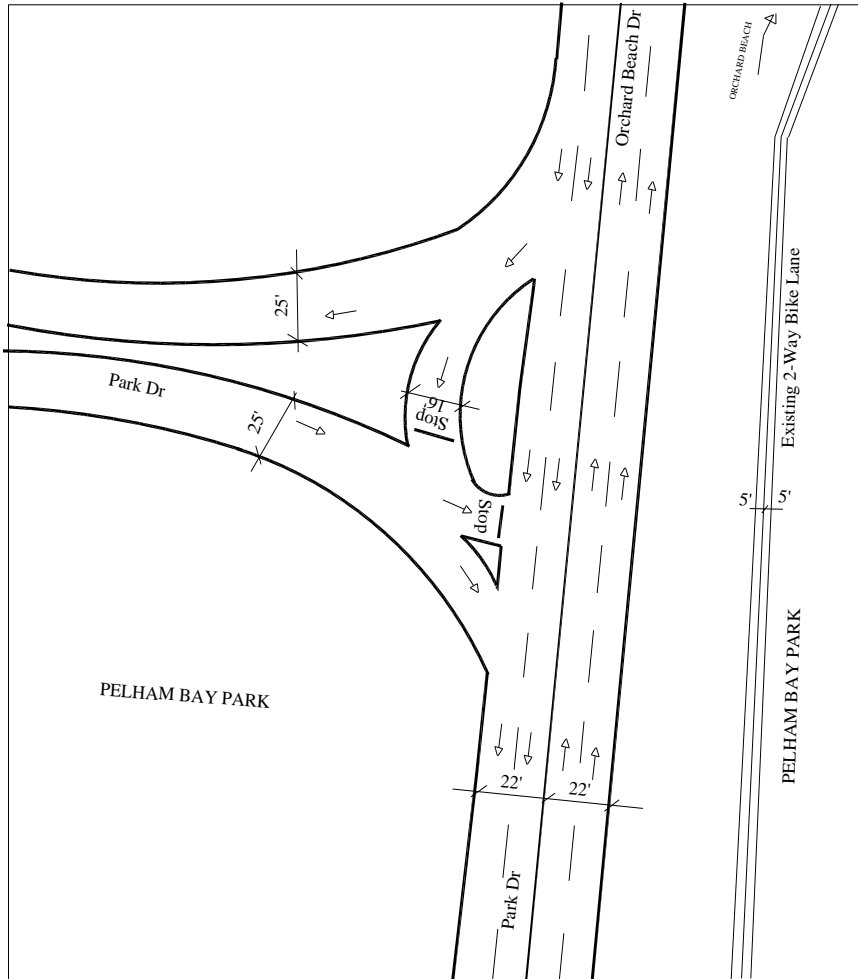
Minor changes to the park drives roadway and traffic controls are needed to improve traffic operations and safety. The recommended improvements are:

- a. Restripe park drives to provide two moving lanes in each direction.
- b. Post additional speed limit signs at various locations along the park drives to reduce speeding (existing speed limit is 35 mph).
- c. Provide Class I two-way bike lanes from Orchard Beach to Roundabout 2 alongside the park drive to separate bicyclists from vehicular traffic (see Figures 9-8, 9-9 and 9-10).
- d. Install additional information/advisory signs (directional to bike path/destination, observing bike crossing, and location of bike racks) for motorists, bicyclists and pedestrians especially on park drives and approaches to the roundabouts.
- e. Create new bus layovers on North Shore Road near the Barton-Pell Mansion Museum and golf courses for safe pick-ups/drop-offs in both directions to prevent buses from stopping and blocking lane.
- f. Several improvements are proposed for the triangular intersection of Orchard Beach Park Drives including redesigning park drives to create a T-intersection, restriping of the northbound approach and creation of a shared left-through lane for the westbound traffic, closure of inner road for southbound traffic, posting advisory signs, installing a new two-way bike lane (Class I) and pavement markings. Figure 9-9 shows the proposed improvements at this location.

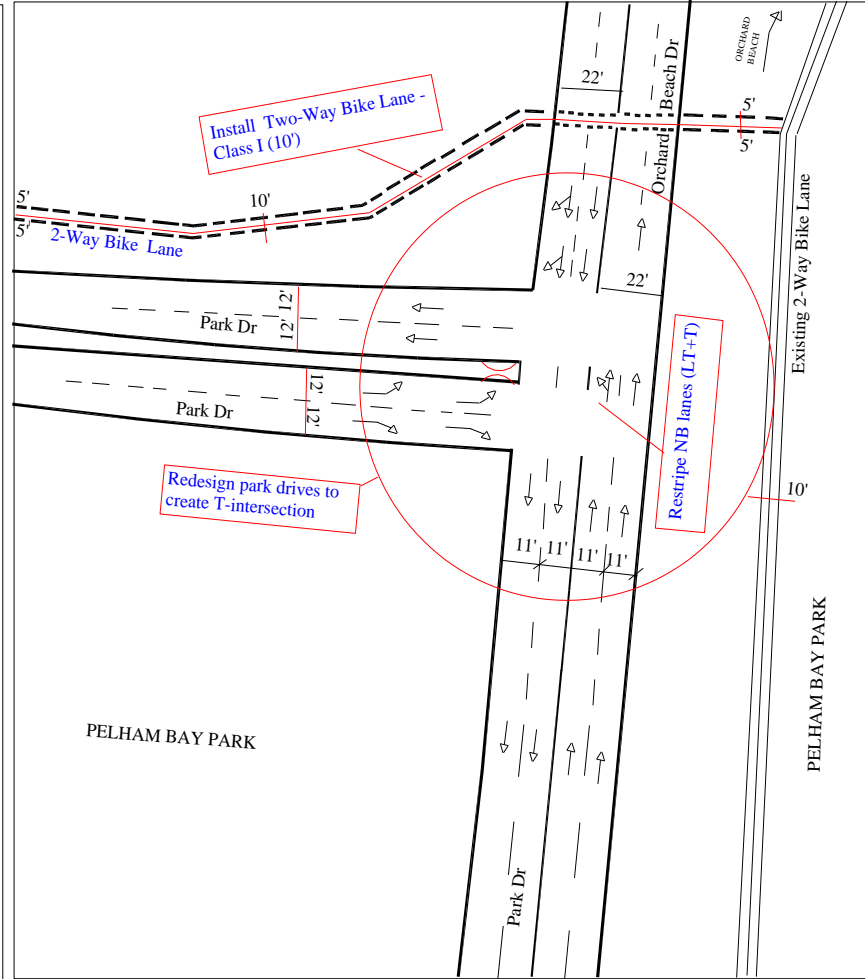


Figure 9-9: Improvements for Orchard Beach Park Drives

Existing Condition



Proposed Condition



## **Crosswalks and Sidewalks**

Refurbish existing and install high visibility crosswalks. Undeveloped sidewalks need to be improved as funds become available, particularly along City Island Avenue between Bridge Street and Belden Point.

## **Signalization and Traffic Control**

Signal timing changes are recommended for two of the five signalized intersections to improve traffic operations. The following improvements are recommended:

- a. **City Island Road and Shore Road.** Add a third phase and implement seasonal plan for Shore Road southbound left turns; change the cycle length from 60 seconds to 90 seconds during the summer months only. The proposed summer timing plan would have 90 seconds cycle with 35 seconds of green time for City Island Road westbound, 18 seconds for Shore Road southbound, and 22 seconds for Shore Road both direction; all phases also include 3 seconds Yellow and 2 seconds All-red. The non-summer timing plan would have 60 seconds cycle with two phases 30 seconds each, which includes 3 seconds Yellow and 2 seconds All-red.
- b. **Cross Street and City Island Avenue:** – shift three seconds of green time from Cross Street WB to the City Island Avenue NB/SB approaches to reduce delays and queuing along City Island Avenue during the summer rush hours.
- c. **Rochelle Street and City Island Avenue:** – install stop bars/signs on NB/SB approaches to facilitate bus U-Turn movements.

## **Parking**

The study's objective with respect to parking is to manage the parking demand and supply to minimize the impact on traffic flow in the study area. As the analysis shows most of the existing off- and on- street parking facilities are at capacity during the summer peak hours. To improve parking efficiency the following measures are recommended:

- a) Reduce total demand for parking by promoting alternative travel modes such as mass transit (adding additional buses, shuttle services or ferry);

- b) Install muni-meters along commercial segments of City Island Avenue during the peak summer months. Introduce a park smart program for on-street parking during the summer peak months.
- c) Improve undeveloped sections of the dead end streets to increase the number of parking spaces. There are no parking regulations on many of the dead-end side streets and the available spaces are not efficiently utilized. The construction of a curb or sidewalk on the dead-end side street would enhance parking and pedestrian movement on the island.

## **Pedestrians and Bicycles**

For pedestrian and bicycle traffic in the study area, a few locations were identified for improvements. The following improvements are proposed for these locations:

- a. Install new and widen existing crosswalks to 12 feet clearly designating pedestrian path at the following intersections along City Island Avenue - Bridge, Cross, Ditmars, Fordham, Winters and Rochelle Streets.
- b. The NYC Bike Master Plan includes a planned bike route on City Island Avenue connecting Belden Point to the existing bike lanes in Pelham Bay Park via City Island Road Bridge.
- c. Install two-way bike lanes (Class I) to connect Orchard Beach to North Shore Roads and Hutchinson Parkway (Westchester) through Roundabout 2.
- d. Provide bike rack at the nine locations identified in Figure 9-10, which also shows the existing and proposed bike routes in the study area.



# Transit

## Seasonal Charter Buses

New York City Transit (NYCT) operates a charter bus service between Orchard Beach and Pelham Bay Park Subway Station in the Bronx during the summer. We recommend that the City Island Chamber of Commerce and Civic Association together with NYCT explore a shuttle service between the Orchard Beach and Belden Point on City Island. This should be coordinated with the Department of Parks and Recreation, so that designated parking spaces could be identified for restaurants customers at Orchard Beach. The photo below shows the existing parking lot with a very low utilization at Orchard Beach. This can be used for patrons parking with the shuttle service taking customers to destinations (restaurants).

Aerial view of Orchard Beach



## **Trolley Service**

The Bronx Tourism Council currently operates a trolley service between Pelham Bay Park Subway Station and City Island on the first Friday night of each month. The trolley (pictured below) serves Bartow Pell Mansion Museum in the park and the restaurants along City Island Avenue. The expansion of the service to include a stop at Orchard Beach as well as frequency and duration of the service should be explored possibly to include complete weekend service to Orchard Beach, Pelham Bay Park, and other areas of interest. Increasing trolley service would attract more visitors without increasing traffic. It would also reduce congestion, parking shortages, and improve the overall air quality, safety and traffic circulation. The photo below shows the City Island “Seaside” Trolley.



City Island “Seaside” Trolley

## **Conclusion**

Based on the analyses of existing and future conditions, a series of recommendations were developed. The implementation of recommendations would improve mobility and safety of all street users.

It should be noted that some of the recommendations do not fall under the jurisdiction of NYCDOT and will require discussion and coordination with other agencies, such as NYC Transit and the NYC Department of Parks and Recreation.

## City Island Transportation Study Recommendations Tracking Sheet

	Intersection/Area	Peak Period	Improvements	Division	Status
1	City Island Avenue @ Bridge Street	All Time Periods	<ul style="list-style-type: none"> <li>• Create a left turn bay (60') SB and move centerline east approximately 11 feet.</li> <li>• Restripe NB approach and create one through and one right turn lane.</li> <li>• Prohibit WB left turns from Bridge St. onto City Island Ave. and create one RT lane only.</li> <li>• Install signage directing all traffic to Minnieford Ave for SB left turns from Bridge Street.</li> <li>• Create 5' ped./bike path from the bridge for approx. 200', north along Bridge Street.</li> <li>• Relocate NB Bx29 bus stop (near Bridge St.) farther south by approximately 100 feet. and create one new bus stop (mid-block) for NB Bx29 instead of two existing bus stops.</li> <li>• Remove 2 parking spaces on the east side of City Island Avenue near Bridge Street.</li> </ul>	<b>Highway Design / Borough Engineering</b>  <b>Signs and Markings</b> <b>Bicycle/Ped. Group</b> <b>Bus Stop Management</b>  <b>Parking</b>	
2	City Island Avenue between Bridge @ Cross Streets	Summer All Time Periods  Summer	<ul style="list-style-type: none"> <li>• Prohibit parking on the west curb near entrances/exits to parking lots (6PM-10PM). and create excl. RT lane (100') for right turning vehicles into restaurants parking lots.</li> <li>• Change two existing entry/exits at Portofino restaurant's parking lot to one entry. (north curb) and one exit (south curb) only.</li> <li>• Coordinate with NYPD enforcement during the summer months against illegal/double parking.</li> </ul>	<b>Highway Design / Parking</b>  <b>Signs and Markings</b> <b>Borough Engineering/ NYPD</b>	
3	City Island Avenue @ Cross Street	Summer All Time Periods	<ul style="list-style-type: none"> <li>• Adjust signal timing by adding 3 seconds of green time to NB/SB from WB approach.</li> <li>• Install "No Parking Fri-Sun, 6-10PM signs along City Island Ave. (60') and relocate SB. Bx29 bus stop farther north by approximately 60 feet.</li> </ul>	<b>Signals</b> <b>Bus Stop Management</b> <b>Signs and Markings</b>	
4	City Island Avenue @ Winters Street	All Time Periods	<ul style="list-style-type: none"> <li>• Relocate SB Bx29 near bus stop to far side to eliminate conflicts from parking lot.</li> </ul>	<b>Bus Stop Management</b>	
5	City Island Avenue @ Belden Point	All Time Periods	<ul style="list-style-type: none"> <li>• Coordinate with NYPD enforcement to regulate traffic (illegal and double parking, etc.). during the summer months (particularly during lunch and dining rush hours).</li> <li>• Explore use of two adjacent parking lots (reserved for marina) during the summer months.</li> <li>• Accommodate existing U-turn for buses at Rochelle Street/City Island Avenue.</li> <li>• Install stop bars on City Island Ave. for NB/SB approaches to allow buses to make U-turns.</li> <li>• Provide truck loading/unloading zones at Belden Point.</li> </ul>	<b>NYPD</b> <b>Marinas</b> <b>Borough Com. Office</b> <b>Highway Design/ Borough Engineering</b> <b>Signs &amp; Markings/</b>	
6	Roundabout 1 City Island Road @ Park Drives	All Time Periods	<ul style="list-style-type: none"> <li>• Restripe circular roadway to clearly delineate two through and one shared Thru-right lane.</li> <li>• Install pavement markings to guide motorists through each roundabout.</li> <li>• Restripe City Island Road EB, exiting the circle, to provide one wide moving lane approx. 14'.</li> <li>• Replace all four YIELD signs with STOP signs.</li> <li>• Relocate EB bus stop farther west (80') and create bus layovers for all three bus stops.</li> <li>• Create new sidewalk and pedestrian resting areas adjacent to new bus layovers.</li> </ul>	<b>Highway Design / Signs and Markings/ Borough Engineering</b>  <b>Bus Stop Management</b>	



## City Island Transportation Study Recommendations Tracking Sheet

	Intersection/Area	Peak Period	Improvements	Division	Status
7	Roundabout 2 North Shore Rd @ Park Drives	All Time Periods	<ul style="list-style-type: none"> <li>• Restripe SB approach of North Shore Road to create one shared thru-right lane.</li> <li>• Restripe WB approach of Orchard Beach Park Drive to create two moving lanes and move the existing STOP bar closer to the circle.</li> <li>• Restripe all four median islands and re-create two circular moving lanes.</li> <li>• Install a new bike lane Class 1 (5') connecting R-2 to Orchard Beach and create bike crossings on north-west side approaches of the circle.</li> <li>• Re-create pedestrian/bicycle crossing on west side of the circle (Hutchinson Pkwy).</li> <li>• Widen the existing horse path (crossing) and post alert-signs for motorists to slow down.</li> </ul>	<b>Highway Design/ Borough Engineering/ Highway Design Highway Design/ Bike Group  Highway Design/ Borough Engineering</b>	
8	Orchard Beach Rd @ Park Drives	All Time Periods	<ul style="list-style-type: none"> <li>• Redesign triangular intersection b/w Orchard Beach Park Drives. Close SB median ramp and create two lanes for North-South approaches and make a cut through the park median.</li> <li>• Create two-way bike lanes alongside park drive connecting Orchard Beach to North Shore Roads (towards Westchester) via Roundabout 2.</li> <li>• Install new bike racks at nine locations (Orchard Beach, Belden Point, Bridge Street, etc).</li> <li>• Create new bus stop layovers on N. Shore Road near the Barton-Pell Mansion Museum / golf courses.</li> <li>• Restripe all park drives to provide two through moving lanes.</li> <li>• Post speed limit signs (35 mph) alongside park drives, wherever is missing.</li> </ul>	<b>Highway Design/ Borough Engineering  Bike Group  Bus Stop Management Borough Engineering/ Highway Design/ Signs and Markings</b>	
9	City Island Road @ Shore Rd / Pelham Pkwy	All Time Periods	<ul style="list-style-type: none"> <li>• Restripe all roadways and re-channelize intersection (islands/crosswalks).</li> <li>• Install summer vs. non-summer timing plan for the intersection; summer incl. 3-phases (35+18+22; plus 5 secs. Y+R each phase) and 90 secs cycle; and non-summer plan incl. 2-phases (30 secs. each) and 60 seconds cycle.</li> </ul>	<b>Highway Design/  Signals</b>	
10	Sidewalks/ Crosswalks	All Time Periods	<ul style="list-style-type: none"> <li>• Construct new/repair old sidewalks along City Island Avenue, if funds are available.</li> <li>• Refurbish pedestrian crosswalks at all signalized intersections.</li> </ul>	<b>Highway Design/ Borough Engineering</b>	
11	Seasonal Bus/ Trolley	All Time Periods	<ul style="list-style-type: none"> <li>• Expand seasonal Charter Bus/Trolley service to include more frequencies and a new station at Orchard Beach.</li> </ul>	<b>Borough Pres. Off./ Community Groups/ Chambers of Commerce</b>	

# APPENDICES

## Introduction

The Highway Capacity Manual (HCM) and SYDRA methodologies were used to calculate levels of service (LOS) for the study area intersections and roundabouts. However, the HCS capacity analysis for City Island Avenue and the three traffic circles (roundabouts) provided unrealistic values. The HCS software did not reflect the actual field conditions. Field observation showed City Island Road/Avenue was heavily congested with long queues due to excess demand even though the cross streets volumes were very low. Under this condition, the HCS results show very low v/c ratios and acceptable levels of service (LOS) that did not reflect the actual field conditions.

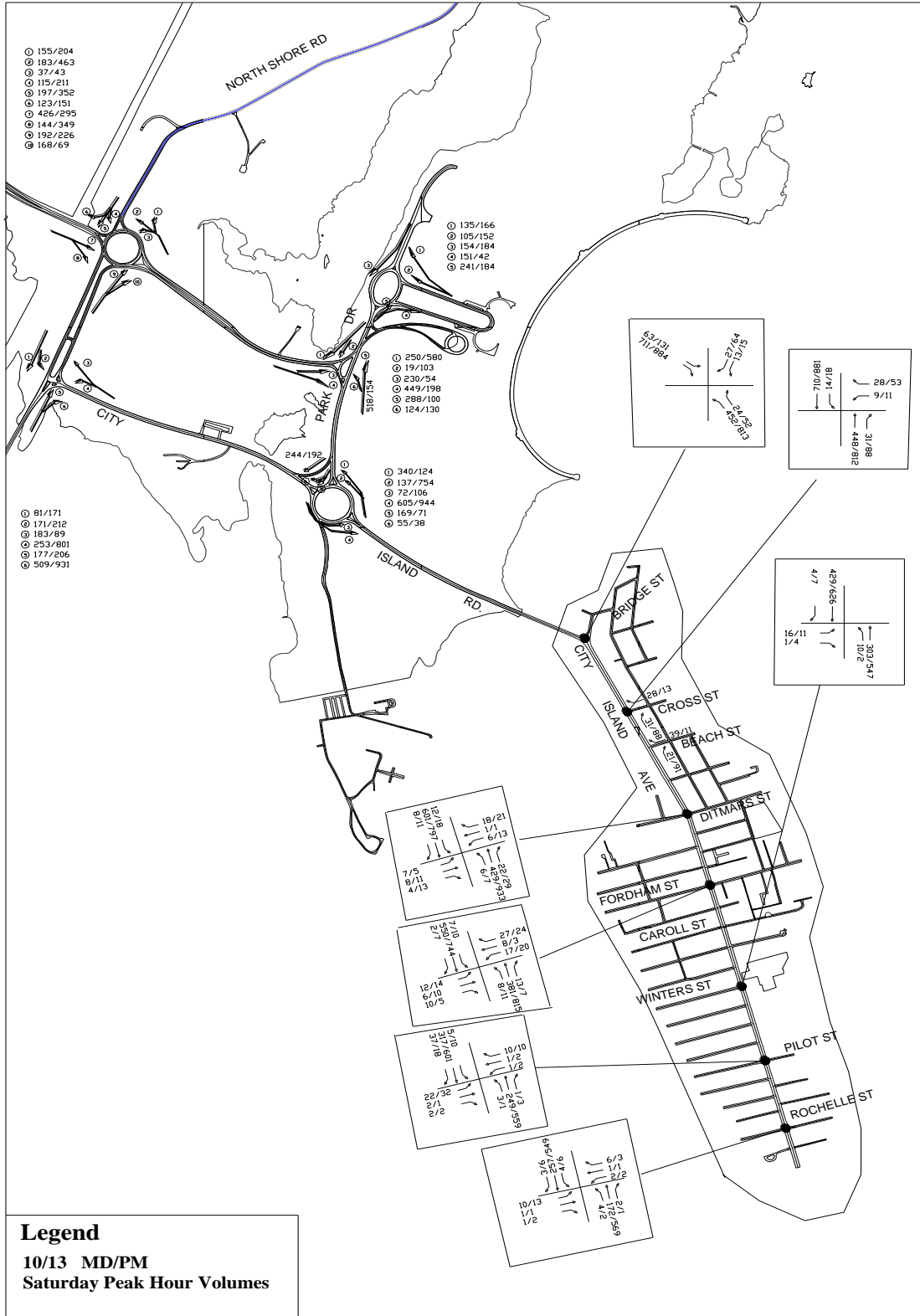
To more effectively simulate the traffic condition, an alternative software was used. It was felt that SYDRA (traffic software) popularly used to analyze roundabouts should yield better results. The SYDRA traffic analysis yielded more realistic queue lengths, suggesting heavy congestion but did not provide realistic LOS. The *Traffic Analysis Appendices* (capacity analysis summary tables) is provided only for illustrative purposes; as the MOE (Measures of Effectiveness) - v/c ratios, delays, and LOS are not representative of the City Island Road/Avenue situation. Finally, even though the improvement measures will enhance operating conditions, the MOEs do not reflect potential improvements in operating conditions.

# **APPENDIX I**

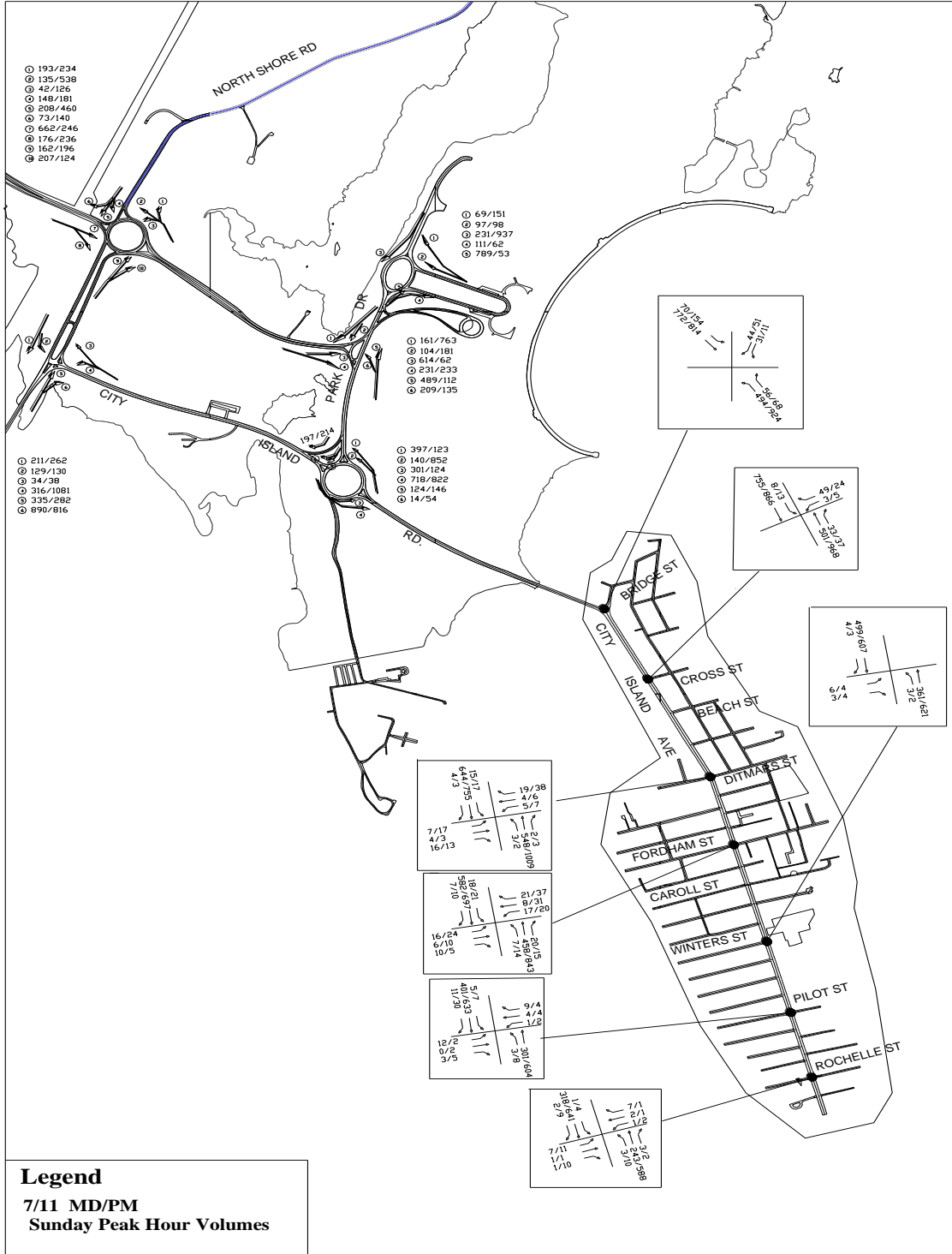
## **Existing Traffic Volumes & Traffic Capacity Analysis**



# Existing Traffic Volumes Saturday Peak Hours (MD and PM)



# Existing Traffic Volumes Sunday Peak Hours (MD and PM)



**Traffic Capacity Analysis  
Summary of Delays, V/C Ratios and LOS**

**&**

**Capacity Analysis for Roundabouts  
Summary of Volumes, Queuing Distances and LOS**

**Traffic Capacity Analysis - Summary of Delays, V/C Ratios and LOS for Signalized Intersections  
Existing Conditions (Summer)**

**Weekday Peak Hours**

			AM			MD			PM		
Intersection	Approach	Lane Group	Volume	Delay	LOS	Volume	Delay	LOS	Volume	Delay	LOS
City Island Avenue and Cross Street	WB		2			4			3		
		LR		30.60	C		28.60	C		28.40	C
			63			12			6		
	NB	TR	246	6.40	A	474	8.40	A	578	10.00	A
			15			8			12		
	SB	LT	2			2			3		
		146	6.00	A	499	10.80	B	721	31.00	C	
City Island Avenue and Fordham Street	EB		2			3			2		
		LTR	3	28.50	C	4	28.60	C	8	28.50	C
			7			6			2		
	WB	LTR	5			3			6		
			3	28.40	C	2	28.40	C	4	28.40	C
			3			5			2		
	NB	LTR	3			1			1		
			215	6.20	A	367	7.30	A	385	7.50	A
			2			2			1		
	SB	LTR	2			4			5		
		145	5.70	A	378	7.30	A	594	9.90	A	
		1			2			3			
City Island Avenue and Winter Street	EB	LR	2			4			8		
			2	28.20	C	0	28.20	C	4	28.50	C
			5			6			2		
	NB	LT	172	6.70	A	300	8.80	A	311	7.90	A
			123	5.50	A	334	6.90	A	427	7.90	A
SB	TR	3			6			8			
City Island Road and Pelham Parkway/Shore Road	WB	LR	170	10.50	B	506	12.30	B	510	12.30	B
			23	10.00	A	65	0.10	A	43	10.30	B
			211	10.70	B	188	10.60	B	310	11.30	B
	NB	TR	151	0.10	A	360	0.40	A	411	0.50	A
			18	10.10	B	66	11.20	B	194	17.90	B
	SB	LT	215	10.70	B	236	10.80	B	197	10.60	B



**Traffic Capacity (HCS) Analysis - Summary of Delays, V/C Ratios and LOS for Unsignalized Intersections  
Existing Conditions (Summer)**

**Weekday Peak Hours**

Intersection	Approach	Lane Group	AM			MD			PM		
			Volume	Delay	LOS	Volume	Delay	LOS	Volume	Delay	LOS
Park Drives - Orchard Beach Circle	SB	T	2			18			118		
		R	28			160			132		
	WB	L									
		T	255	11.20	B	237	12.40	B	148	11.80	B
	EB	R									
		L	131			85			50		
City Island Avenue and Bridge Street	NB	T	379			430			526		
		R	10			64			11		
		L	20			42			133		
	SB	T	218	8.20	A	468	8.60	A	700	9.20	A
		L	9			12			27		
	WB	T		11.60	B		13.10	B		21.90	C
R		66			38			29			
City Island Avenue and Ditmars Street	NB	L	2			0			1		
		T	246	7.50	A	478	8.50	A	582	9.10	A
		R	1			3			4		
	SB	L	12			1			2		
		T	143	7.80	A	493	8.40	A	714	8.70	A
		R	4			2			1		
	WB	L	5			2			8		
		T	4	10.30	B	1	12.60	B	2	14.60	B
		R	3			2			9		
EB	L	3			11			6			
	T	7	10.10	B	4	13.00	B	4	15.00	B	
	R	6			8			10			
City Island Avenue and Pilot Street	NB	L	3			4			5		
		T	94	7.40	A	224	7.80	A	264	8.00	A
		R	2			3			1		
	SB	L	2			4			1		
		T	77	7.40	A	227	7.70	A	339	7.80	A
		R	4			4			3		
	WB	L	1			1			0		
		T	3	9.50	A	1	10.40	B	3	10.90	B
		R	1			1			2		
EB	L	4			2			1			
	T	1	9.20	A	1	10.40	B	0	11.20	B	
	R	2			1			0			
City Island Avenue and Rochelle Street	NB	L	2			6			6		
		T	13	7.30	A	159	7.60	A	170	7.80	A
		R	4			5			4		
	SB	L	1			2			2		
		T	27	7.30	A	158	7.60	A	231	7.60	A
		R	2			0			0		
	WB	L	3			4			8		
		T	4	9.00	A	3	10.00	A	2	10.50	B
		R	2			2			1		
EB	L	3			3			0			
	T	1	8.80	A	0	9.50	A	0	9.90	A	
	R	3			5			11			

**Traffic Capacity Analysis - Summary of Delays, V/C Ratios and LOS for Signalized Intersections  
Existing Conditions (Summer)**

**Weekend Peak Hours**

			Saturday MD			Saturday PM			Sunday MD			Sunday PM		
Intersection	Approach	Lane Group	Volume	Delay	LOS	Volume	Delay	LOS	Volume	Delay	LOS	Volume	Delay	LOS
City Island Avenue and Cross Street	WB		9			11			3			5		
		LR		29.40	C		30.50	C		30.10	C		29.10	C
			28			53			49			24		
	NB		448	18.50	B	812	33.10	C	501	19.20	B	968	40.50	D
			31			88			33			37		
		TR	14			18			8			13		
	SB	LT	710	32.40	C	881	39.80	D	755	33.90	C	866	43.60	D
City Island Avenue and Fordham Street	EB	LTR	12			14			16			24		
			6	29.30	C	10	29.30	C	6	29.40	C	10	29.90	C
			10			5			10			5		
	WB	LTR	17			20			17			20		
			8	30.20	C	3	30.00	C	8	29.80	C	31	31.40	C
			27			24			21			37		
	NB		8			11			7			14		
		LTR	381	7.70	A	815	17.80	B	458	8.70	A	843	20.40	C
			13			7			20			15		
	SB		7			10			18			21		
LTR		550	9.30	A	744	13.80	B	582	10.30	B	697	13.50	B	
		2			7			7			10			
City Island Avenue and Winter Street	EB	LR	16			11			6			4		
			1	28.70	C		28.60	C		28.40	C		28.30	C
			10			4			3			4		
	NB		2			2			3			2		
		LT	303	10.10	B	547	13.00	B	361	8.90	A	621	16.00	B
	SB	TR	429	7.80	A	626	10.40	B	499	8.50	A	607	9.90	A
		4			7			4			3			
City Island Road and Pelham Parkway/Shore Road	WB	LR	253	10.90	B	801	14.80	B	316	11.20	B	1081	10.50	B
			183	19.90	B	89	9.90	A	34	10.20	B	38		
	NB	TR	177	10.60	B	206	10.70	B	335	11.40	B	282	10.70	B
			509			931			890			816		
	SB		171	14.60	B	212	17.00	B	129	14.20	B	130	10.10	B
		LT	81	10.10	B	171	10.50	B	211	10.70	B	262	10.70	B

**Traffic Capacity (HCS) Analysis - Summary of Delays, V/C Ratios and LOS for Unsignalized Intersections  
Existing Conditions (Summer)**

**Weekend Peak Hours**

			Saturday MD			Saturday PM			Sunday MD			Sunday PM		
Intersection	Approach	Lane Group	Volume	Delay	LOS	Volume	Delay	LOS	Volume	Delay	LOS	Volume	Delay	LOS
Park Drives - Orchard Beach Circle	SB	T	19			103			104			181		
		R	250			580			161			763		
	WB	L												
		T	124	11.70	B	130	16.80	B	209	12.80	B	135	23.30	C
	EB	L	230			54			614			62		
		T		24.40	C		14.30	B		24.90	C		21.20	C
			449			198			231			233		
City Island Avenue and Bridge Street	NB	T	452			813			494			924		
		R	24			52			56			68		
		L	63			131			70			154		
	SB	T	711	8.60	A	884	10.70	B	772	8.90	A	814	11.90	B
		L	13			15			31			11		
	WB	T		15.20	C		28.00	C		19.80	C		30.30	C
R		27			64			44			51			
City Island Avenue and Ditmars Street	NB	L	6			7			7			14		
		T	429	8.80	A	933	9.60	A	458	8.70	A	843	9.20	A
		R	22			29			20			15		
	SB	L	12			18			18			21		
		T	601	8.30	A	797	10.30	B	582	8.40	A	697	9.80	A
		R	8			11			7			10		
	WB	L	6			13			17			20		
		T	1	12.30	B	1	20.60	C	8	13.70	B	31	21.90	C
		R	18			21			21			37		
	EB	L	7			5			16			24		
T		8	14.00	B	11	19.10	B	6	14.30	B	10	22.90	C	
R		4			13			10			5			
City Island Avenue and Pilot Street	NB	L	3			1			3			8		
		T	249	8.00	A	559	8.80	A	301	8.10	A	604	8.90	A
		R	1			3			0			0		
	SB	L	5			10			5			7		
		T	317	7.80	A	601	8.60	A	401	7.90	A	633	8.70	A
		R	37			18			11			30		
	WB	L	1			2			1			2		
		T	1	10.00	A	2	13.00	B	4	10.80	B	4	14.20	B
		R	10			10			9			4		
EB	L	22			32			12			2			
	T	2	11.30	B	1	15.50	B	0	11.70	B	2	14.00	B	
	R	2			2			3			5			
City Island Avenue and Rochelle Street	NB	L	4			2			3			10		
		T	172	7.80	A	569	8.70	A	243	8.00	A	588	9.10	A
		R	2			1			3			2		
	SB	L	4			6			1			4		
		T	257	7.60	A	549	8.80	A	318	7.80	A	641	8.80	A
		R	3			6			2			9		
	WB	L	2			2			1			2		
		T	1	9.80	A	1	13.60	B	2	10.30	B	1	14.80	B
		R	6			3			7			1		
	EB	L	10			13			7			11		
		T	1	10.50	B	1	14.60	B	1	11.10	B	1	15.10	C
R		1			2			1			10			

**Traffic Capacity Analysis for Roundabouts**  
**Summary of Vehicular Volumes and Queuing Distances**  
**Existing Conditions (Summer)**

			Weekdays					
			AM		MD		PM	
Roundabout/Circle	Approach	Lane Group	Volume	Queuing Dist. (Veh.)	Volume	Queuing Dist. (Veh.)	Volume	Queuing Dist. (Veh.)
City Island Road Circle/Park Drive (Roundabout #1)	NB	L	5	2	5	3	10	6
		T	8	2	8	3	12	6
		R	7	2	7	3	9	6
	SB	L	39	8	39	24	49	35
		T	257	8	257	24	321	36
		R	61	8	61	24	99	36
	EB	L	129	10	129	26	72	42
		T	253	10	253	26	512	42
		R	44	10	44	26	21	42
	WB	L	20	19	22	28	25	27
T		339	19	339	29	452	27	
R		155	19	155	29	103	27	
Bartow Pell Circle Shore Road/Park Drive (Roundabout #2)	NB	L	19	14	15	14	25	28
		T	104	14	129	14	214	29
		R	130	14	124	14	139	29
	SB	L	11	12	15	17	45	29
		T	121	12	229	17	310	30
		R	85	12	108	17	137	30
	EB	L	15	13	18	23	20	47
		T	187	13	203	24	493	47
		R	47	13	201	24	160	47
	WB	L	12	15	26	21	11	21
T		134	15	189	22	198	21	
R		136	15	182	22	139	21	
Park Drives/ Orchard Beach Drives (Roundabout #3)	NB	L	0	6	0	8	0	6
		T	37	6	81	8	44	6
		R	21	6	29	8	16	6
	SB	L	0	7	0	9	0	7
		T	90	7	130	9	72	7
		R	0	7	0	9	0	7
	WB	L	89	7	125	8	69	7
		T	0	7	0	8	0	7
		R	2	7	12	8	7	7

**Traffic Capacity Analysis for Roundabouts**  
**Summary of Volumes and Queuing Distances**  
**Existing Conditions (Summer)**

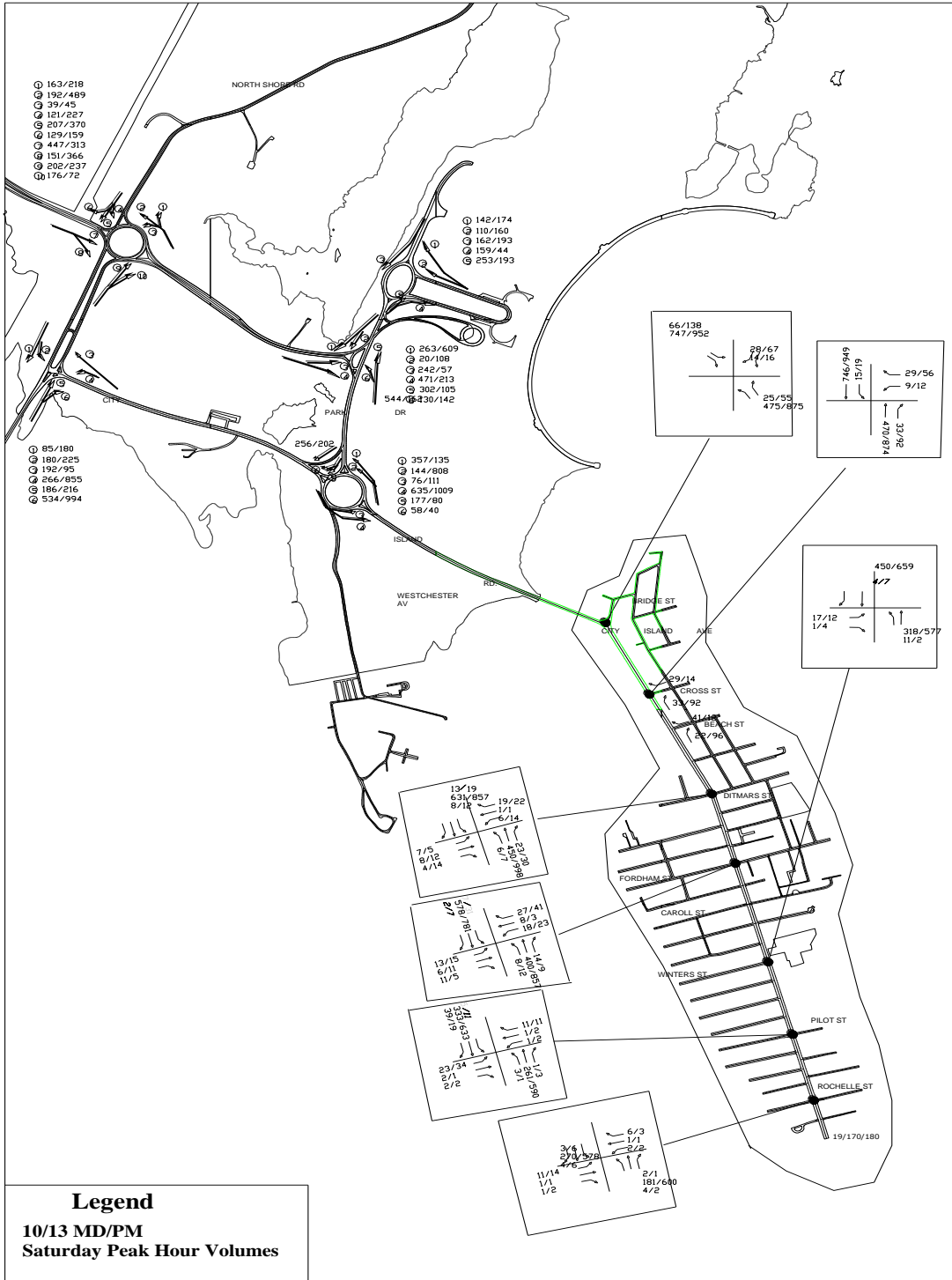
			Saturday				Sunday			
			MD		PM		MD		PM	
Roundabout/Circle	Approach	Lane Group	Volume	Queuing Dist. (Veh.)	Volume	Queuing Dist. (Veh.)	Volume	Queuing Dist. (Veh.)	Volume	Queuing Dist. (Veh.)
City Island Road Circle/Park Drive (Roundabout #1)	NB	L	15	8	7	7	8	6	7	8
		T	14	8	15	7	11	6	20	8
		R	12	8	12	7	10	6	11	8
	SB	L	55	28	38	120	14	18	54	36
		T	169	29	711	120	124	18	146	37
		R	244	29	192	118	214	25	214	37
	EB	L	72	48	106	185	301	63	124	65
		T	605	49	944	185	718	63	822	65
		R	25	49	15	179	22	62	14	64
	WB	L	30	20	25	47	35	32	33	57
T		137	20	754	48	140	32	852	58	
R		340	29	124	48	397	63	123	58	
Bartow Pell Circle Shore Road/Park Drive (Roundabout #2)	NB	L	20	28	16	29	12	35	18	26
		T	160	28	226	30	162	35	196	27
		R	180	28	69	30	207	38	124	27
	SB	L	115	26	211	58	148	26	181	81
		T	197	26	352	58	208	26	460	81
		R	123	26	151	57	73	26	140	80
	EB	L	25	40	15	56	22	65	20	47
		T	426	41	295	56	662	66	246	48
		R	144	41	349	58	176	66	236	48
	WB	L	37	22	43	43	42	22	126	56
T		183	22	463	44	135	22	538	57	
R		155	22	204	44	193	22	234	57	
Park Drives/ Orchard Beach Drives (Roundabout #3)	NB	L	0	9	1	10	2	12	3	8
		T	241	9	184	11	789	12	53	8
		R	154	9	42	11	111	12	62	8
	SB	L	0	8	0	8	2	10	4	14
		T	154	8	184	8	231	10	937	14
		R	0	8	0	8	0	10	0	0
	WB	L	135	14	166	26	97	11	151	18
		T	0	14	0	26	0	12	0	18
		R	105	14	152	26	69	12	98	18

## **APPENDIX II**

### **Future Traffic Volumes & Traffic Capacity Analysis**

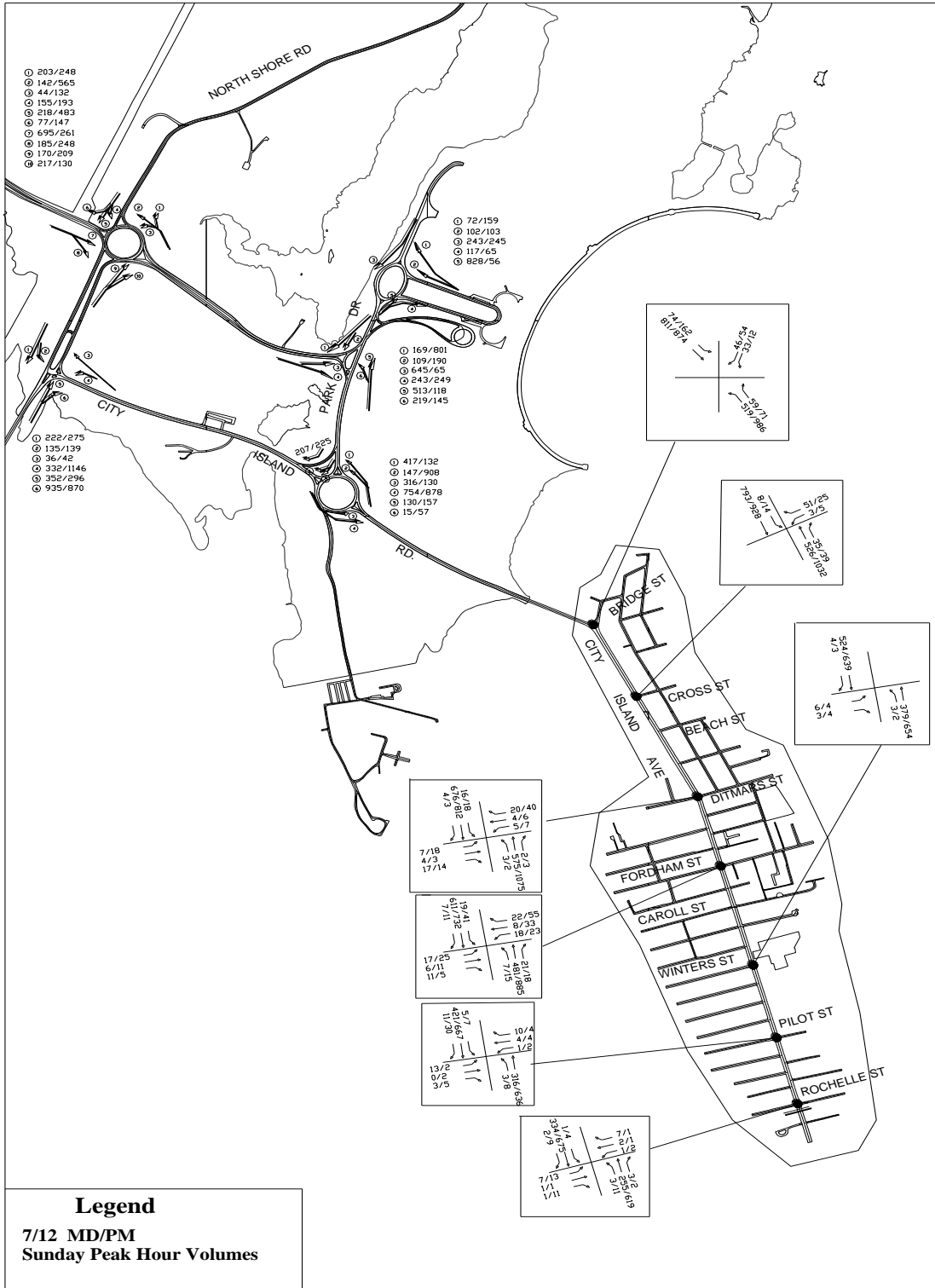


# Future Traffic Volumes Saturday Peak Hours (MD and PM)





# Future Traffic Volumes Sunday Peak Hours (MD and PM)



**Traffic Capacity Analysis**  
**Summary of Delays, V/C Ratios and LOS**

**&**

**Capacity Analysis for Roundabouts**  
**Summary of Volumes, Queuing Distances and LOS**

**Traffic Capacity Analysis - Summary of Delays, V/C Ratios and LOS  
Future Conditions (Signalized Intersections)**

**Weekday Peak Hours**

			AM			MD			PM		
Intersection	Approach	Lane Group	Volume	Delay	LOS	Volume	Delay	LOS	Volume	Delay	LOS
City Island Avenue and Cross Street	WB		2			4			3		
		LR		30.70	C		28.60	C		28.40	C
			66			13			6		
	NB	TR	295	6.80	A	498	8.80	A	641	11.10	B
			16			8			13		
	SB	LT	2			2			3		
		153	6.10	A	524	11.20	B	785	34.70	C	
City Island Avenue and Ditmars Street	NB	L	2			0			1		
		T	281	8.30	A	502	33.50	C	627	43.60	D
		R	1			3			4		
	SB	L	13			1			2		
		T	159	8.00	A	518	30.40	C	777	42.70	D
		R	4			2			1		
	WB	L	5			2			8		
		T	4	29.50	C	1	28.60	C	2	30.60	C
		R	3			2			9		
	EB	L	3			12			6		
T		7	29.80	C	4	30.30	C	4	29.90	C	
	R	6			8			11			
City Island Avenue and Fordham Street	EB	LTR	2			3			2		
			3	28.50	C	4	28.70	C	8	28.50	C
			7			6			2		
	WB	LTR	8			3			8		
			3	29.40	C	2	28.40	C	4	29.10	C
			25			5			17		
	NB	LTR	3			1			1		
			227	6.20	A	385	7.50	A	405	7.70	A
		3			2			1			
SB	LTR	2			4			31			
		154	5.80	A	397	7.60	A	625	11.50	B	
		1			2			3			
City Island Avenue and Winter Street	EB	LR	2			4			8		
				28.20	C		28.30	C		28.50	C
			2			0			4		
	NB	LT	5			6			2		
			183	6.80	A	315	8.90	A	331	8.20	A
SB	TR	134	5.60	A	351	7.00	A	451	8.10	A	
		3			6			8			
City Island Road and Pelham Parkway/Shore Road	WB	LR	205	10.60	B	531	12.50	B	551	12.60	B
			28	10.10	B	68	0.10	A	48	10.30	B
		222	10.80	B	197	10.70	B	326	11.40	B	
	NB	TR	168	0.10	A	378	0.50	A	457	0.50	A
			20	10.20	B	69	11.30	B	209	19.60	B
	SB	LT	226	10.80	B	248	10.90	B	207	10.70	B

**Traffic Capacity (HCS) Analysis - Summary of Delays, V/C Ratios and LOS  
Future Conditions (Unsignalized Intersections)**

**Weekday Peak Hours**

Intersection	Approach	Lane Group	AM			MD			PM		
			Volume	Delay	LOS	Volume	Delay	LOS	Volume	Delay	LOS
Park Drives - Orchard Beach Circle	SB	T	2			19			124		
		R	29			168			139		
	WB	L									
		T	275	11.40	B	249	12.60	B	161	12.10	B
	EB	R									
		L	138			89			53		
City Island Avenue and Bridge Street	NB	T	435			452			574		
		R	12			67			43		
	SB	L	21			44			140		
		T	241	8.30	A	491	9.20	A	763	9.40	A
	WB	L	9			13			28		
		T		12.20	B		13.20	B		26.00	C
City Island Avenue and Pilot Street	NB	R	69			40			30		
		L	3			4			5		
		T	101	7.40	A	235	7.90	A	281	8.10	A
	SB	R	2			3			1		
		L	2			4			1		
		T	86	7.40	A	238	7.80	A	359	8.00	A
	WB	R	4			4			3		
		L	1			1			0		
		T	3	9.50	A	1	10.40	B	3	15.10	B
	EB	R	1			1			2		
		L	4			2			1		
		T	1	9.30	A	1	10.40	B	0	11.40	B
City Island Avenue and Rochelle Street	NB	R	2			1			0		
		L	2			6			6		
		T	16	7.30	A	167	7.70	A	183	7.90	A
	SB	R	4			5			4		
		L	1			2			2		
		T	33	7.30	A	166	7.70	A	246	7.70	A
	WB	R	2			0			0		
		L	3			4			8		
		T	4	9.00	A	3	10.00	A	2	10.60	B
	EB	R	2			2			1		
		L	3			3			0		
		T	1	8.80	A	0	9.50	A	0	10.00	A
		R	3			5			12		

**Traffic Capacity Analysis - Summary of Delays, V/C Ratios and LOS  
Future Conditions (Signalized Intersections)**

Intersection	Approach	Lane Group	Saturday MD			Saturday PM			Sunday MD			Sunday PM		
			Volume	Delay	LOS	Volume	Delay	LOS	Volume	Delay	LOS	Volume	Delay	LOS
City Island Avenue and Cross Street	WB		9			12			3			5		
		LR		29.60	C		30.70	C		30.20	C		29.20	C
			29			56			51			25		
	NB													
		TR	470	18.70	B	874	34.90	C	526	20.10	C	1032	41.70	D
			33			92			37			39		
SB														
	LT	15			19			8			14			
		746	32.70	C	949	42.30	D	793	34.20	C	928	44.50	D	
City Island Avenue and Ditmars Street	NB	L	6			7			3			2		
		T	450	34.90	C	998	40.00	D	575	34.60	C	1075	45.30	D
		R	23			30			2			3		
	SB	L	13			19			16			18		
		T	631	43.10	D	851	46.80	D	676	40.20	D	812	52.80	D
		R	8			12			4			3		
	WB	L	6			14			5			7		
		T	1	32.20	C	1	34.30	C	4	30.90	C	6	33.70	C
		R	19			22			20			40		
	EB	L	7			5			7			18		
		T	8	29.80	C	12	30.80	C	4	30.20	C	3	31.00	C
		R	4			14			17			14		
City Island Avenue and Fordham Street	EB		13			15			17			25		
		LTR	6	29.40	C	11	29.40	C	6	29.40	C	11	30.10	C
			11			5			11			5		
	WB		18			23			18			23		
		LTR	8	30.30	C	3	31.10	C	8	29.90	C	33	32.60	C
			28			41			22			55		
	NB		8			12			7			15		
		LTR	400	7.70	A	857	20.90	C	481	8.90	A	885	25.00	C
			14			9			21			18		
	SB		7			11			19			41		
		LTR	578	9.30	A	781	15.20	B	611	10.90	B	732	18.30	B
			2			7			7			11		
City Island Avenue and Winter Street	EB		17			12			6			4		
		LR		28.70	C		28.60	C		28.40	C		28.30	C
			1			4			3			4		
	NB		11			2			3			2		
		LT	318	10.20	B	577	14.20	B	371	9.10	A	654	18.00	B
			450	7.90	A	659	11.00	B	524	8.90	A	639	10.50	B
SB		4			7			4			3			
	TR													
		266	11.00	B	855	15.40	B	1135	11.50	B	1146	14.30	B	
City Island Road and Pelham Parkway/Shore Road	WB													
		LR												
			192			95			40	10.40	B	42		
	NB		186	10.70	B	216	10.80	B	352	12.20	B	296	11.20	B
		TR												
			534			994			934			870		
SB		180	14.80	B	225	18.10	B	137	14.30	B	139	14.30	B	
	LT													
		85	10.20	B	180	10.50	B	275	10.80	B	275	11.00	B	

**Traffic Capacity (HCS) Analysis - Summary of Delays, V/C Ratios and LOS  
Future Conditions (Unsignalized Intersections)**

Intersection	Approach	Lane Group	Saturday MD			Saturday PM			Sunday MD			Sunday PM		
			Volume	Delay	LOS	Volume	Delay	LOS	Volume	Delay	LOS	Volume	Delay	LOS
Park Drives - Orchard Beach Circle	SB	T	20			108			109			190		
		R	263			609			169			801		
	WB	L												
		T	130	11.80	B	142	17.90	B	219	12.90	B	145	26.10	C
	EB	L	242			57			645			65		
		T		24.60	C		15.20	B		25.20	C		24.10	C
City Island Avenue and Bridge Street	NB	R	475			875			519			986		
		L	25			55			59			71		
	SB	T	66			138			74			162		
		T	747	8.80	A	952	11.00	B	811	9.00	A	874	12.20	B
	WB	L	14			16			33			12		
		T		15.20	B		34.20	C		19.90	B		33.40	C
City Island Avenue and Pilot Street	NB	L	3			1			3			8		
		T	261	8.20	A	590	8.90	A	316	8.20	A	636	9.00	A
	SB	R	1			3			0			0		
		L	5			11			5			7		
		T	333	7.90	A	633	8.70	A	421	8.10	A	667	8.80	A
	WB	R	39			19			12			25.2		
		L	1			2			1			2		
	EB	T	1	10.00	A	2	13.30	B	4	10.80	B	4	14.60	B
		R	11			11			10			4		
		L	23			34			13			2		
City Island Avenue and Rochelle Street	NB	T	2	11.40	B	1	16.20	B	0	11.70	B	2	14.40	B
		R	2			2			3			5		
	SB	L	4			2			3			11		
		T	181	7.90	A	600	8.80	A	255	8.10	A	619	9.20	A
		R	2			1			3			2		
	WB	L	4			6			1			4		
		T	270	7.80	A	578	8.90	A	334	7.90	A	675	8.90	A
	EB	R	3			6			2			9		
		L	2			2			1			2		
		T	1	9.80	A	1	14.00	B	2	10.30	B	1	15.30	B
EB	R	6			3			7			1			
	L	11			14			7			13			
	T	1	10.50	B	1	15.10	B	1	11.10	B	1	15.80	B	
		R	1			2					11			

**Traffic Capacity Analysis for Roundabouts  
Summary of Volumes and Queuing Distances  
Future Conditions (Summer)**

			Weekdays					
			AM		MD		PM	
Roundabout/Circle	Approach	Lane Group	Volume	Queuing Dist. (Veh.)	Volume	Queuing Dist. (Veh.)	Volume	Queuing Dist. (Veh.)
City Island Road Circle/Park Drive (Roundabout #1)	NB	L	5	2	5	3	11	6
		T	8	2	8	3	13	6
		R	7	2	7	3	9	6
	SB	L	6	8	41	24	51	35
		T	109	8	270	24	337	36
		R	64	8	64	24	104	36
	EB	L	43	10	135	26	76	42
		T	153	10	266	26	568	42
		R	46	10	46	26	22	42
	WB	L	21	19	23	28	26	27
T		203	19	356	29	492	27	
R		301	19	163	29	114	27	
Bartow Pell Circle Shore Road/Park Drive (Roundabout #2)	NB	L	20	14	16	14	26	28
		T	113	14	135	14	225	29
		R	137	14	130	14	146	29
	SB	L	13	12	16	17	53	29
		T	127	12	240	17	326	30
		R	89	12	113	17	144	30
	EB	L	16	13	19	23	21	47
		T	197	13	213	24	525	47
		R	49	13	211	24	168	47
	WB	L	13	15	27	21	12	21
T		147	15	198	22	212	21	
R		148	15	191	22	150	21	
Park Drives/ Orchard Beach Drives (Roundabout #3)	NB	L	0	6	0	8	0	6
		T	39	6	85	8	46	6
		R	22	6	30	8	17	6
	SB	L	0	7	0	9	0	7
		T	95	7	137	9	76	7
		R	0	7	0	9	0	7
	WB	L	93	7	131	8	72	7
		T	0	7	0	8	0	7
		R	2	7	13	8	7	7

**Traffic Capacity Analysis for Roundabouts**  
**Summary of Volumes and Queuing Distances**  
**Future Conditions (Summer)**

			Saturday				Sunday			
			MD		PM		MD		PM	
Roundabout/Circle	Approach	Lane Group	Volume	Queuing Dist. (Veh.)	Volume	Queuing Dist. (Veh.)	Volume	Queuing Dist. (Veh.)	Volume	Queuing Dist. (Veh.)
City Island Road Circle/Park Drive (Roundabout #1)	NB	L	16	8	7	7	8	6	7	8
		T	15	8	16	7	12	6	21	8
		R	13	8	13	7	11	6	12	8
	SB	L	58	28	40	120	15	18	57	36
		T	177	29	747	120	130	18	157	37
		R	256	29	202	118	225	25	225	37
	EB	L	76	48	111	185	316	63	132	65
		T	635	49	1009	185	753	63	878	65
		R	26	49	16	179	23	62	15	64
	WB	L	32	20	26	47	37	32	35	57
T		144	20	808	48	147	32	908	58	
R		357	29	135	48	417	63	130	58	
Bartow Pell Circle Shore Road/Park Drive (Roundabout #2)	NB	L	21	28	17	29	13	35	19	26
		T	168	28	237	30	170	35	209	27
		R	189	28	72	30	217	38	130	27
	SB	L	121	26	227	58	155	26	193	81
		T	207	26	370	58	218	26	483	81
		R	129	26	159	57	77	26	147	80
	EB	L	26	40	16	56	23	65	21	47
		T	447	41	313	56	695	66	261	48
		R	151	41	370	58	185	66	248	48
	WB	L	39	22	46	43	44	22	132	56
T		192	22	489	44	142	22	565	57	
R		163	22	218	44	203	22	248	57	
Park Drives/ Orchard Beach Drives (Roundabout #3)	NB	L	0	9	1	10	2	12	3	8
		T	253	9	193	11	828	12	56	8
		R	162	9	44	11	117	12	65	8
	SB	L	0	8	0	8	2	10	4	14
		T	162	8	193	8	243	10	984	14
		R	0	8	0	8	0	10	0	0
	WB	L	142	14	174	26	102	11	159	18
		T	0	14	0	26	0	12	0	18
		R	110	14	160	26	72	12	103	18



## **APPENDIX III**

### **Existing Pedestrian Volumes**

## Seasonal Pedestrian Counts

Code	Intersection Name	Weekdays			Saturday		Sunday	
		AM (8-9) Crosswalk (Ped./hr.)	MD (1-2) Crosswalk (Ped./hr.)	PM (5-6) Crosswalk (Ped./hr.)	MD (1-2) Crosswalk (Ped./hr.)	PM (6-7) Crosswalk (Ped./hr.)	MD (1-2) Crosswalk (Ped./hr.)	PM (6-7) Crosswalk (Ped./hr.)
1	City Island Avenue & Rochelle Street	22	87	122	92	182	108	174
2	City Island Avenue & Pilot Street	20	45	52	20	80	18	47
3	City Island Avenue & Winters Street	12	54	44	25	60	32	66
4	City Island Avenue & Centre Street	23	22	56	41	72	30	76
5	City Island Avenue & Carroll Street	28	46	60	34	82	44	72
6	City Island Avenue & Fordham Street	71	113	54	124	139	104	163
7	City Island Avenue & Ditmars Street	20	26	46	30	56	33	48
8	City Island Avenue & Cross Street	12	15	22	42	67	41	77
9	City Island Avenue & Bridge Street	14	35	28	48	56	41	50
10	City Island Rd & Shore Rds	6	12	8	14	7	11	15
11	City Island Road & Park Drives Circle (RB 1)	3	9	5	12	9	10	15
12	Bartow Pell Circle (RB 2)	2	5	3	7	6	9	5
13	Orchard Beach Circle (RB 3)	3	9	14	11	33	25	34

### Pre-Seasonal Pedestrian Counts

Code	Intersection Name	Weekdays			Saturday		Sunday	
		AM (8-9) Crosswalk (Ped./hr.)	MD (1-2) Crosswalk (Ped./hr.)	PM (5-6) Crosswalk (Ped./hr.)	MD (1-2) Crosswalk (Ped./hr.)	PM (6-7) Crosswalk (Ped./hr.)	MD (1-2) Crosswalk (Ped./hr.)	PM (6-7) Crosswalk (Ped./hr.)
1	City Island Avenue & Rochelle Street	19	45	76	62	112	70	102
2	City Island Avenue & Pilot Street	18	65	60	22	42	33	30
3	City Island Avenue & Winters Street	23	75	56	29	54	53	64
4	City Island Avenue & Centre Street	17	34	58	46	76	69	33
5	City Island Avenue & Carroll Street	18	68	55	43	42	54	67
6	City Island Avenue & Fordham Street	23	88	60	111	98	112	77
7	City Island Avenue & Ditmars Street	28	34	44	42	48	29	54
8	City Island Avenue & Cross Street	9	20	23	38	42	56	45
9	City Island Avenue & Bridge Street	17	32	33	40	44	28	39
10	City Island Road & Shore Rds	2	7	8	15	6	9	8
11	City Island Rd & Park Drives Circle (RB 1)	2	3	3	7	8	6	4
12	Bartow Pell Circle (RB 2)	0	2	1	7	3	5	4
13	Orchard Beach Circle (RB 3)	0	4	3	7	6	12	8