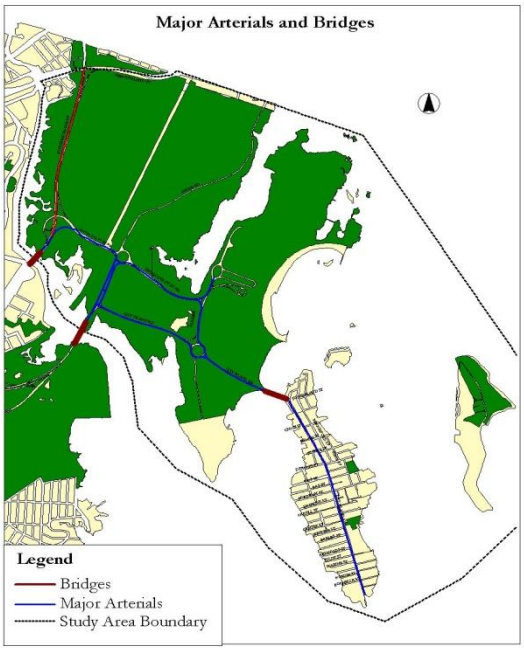
City Island Transportation Study



EXISTING AND FUTURE CONDITIONS WITH RECOMMENDATIONS

DRAFT FINAL REPORT

The City of New York
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New York City Department of Transportation
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Member of the New York Metropolitan Transportation Council

March 2007

City Island Transportation Study
Existing and Future Conditions
with Recommendations

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INTRODUCTION

The City Island, so named because of a plan devised in 1761 to develop a self-contained municipality and port to rival New York, has become instead an important regional recreational attraction with seafood restaurants and marinas. The City Island is located in the south/east section of the Bronx and north of Queens between Eastchester Bay and the Long Island Sound. It is only about a mile-and-a-half long and a half-mile wide at its widest point. The 230-acre Island is connected to the mainland at Rodman's Neck by City Island Avenue Causeway.
Exhibit 1-1 shows the study area in the regional setting.

The City Island is home to a small population of approximately 5,000 residents who live in low-density residential areas that are located on the side streets of the Island's main corridor, City Island Avenue. City Island Avenue runs the length of the entire Island from City Island Bridge to the southern end at Belden Point. It is a wide street with one moving lane and a parking lane in each direction, separated by a striped "Fire Lane" median. During the summer months, the Island becomes congested as thousands of visitors converge there to enjoy its seafood restaurants and marinas. This traffic, limited access and egress routes, and an acute shortage of parking spaces are a constant source of concern for community residents. Congestion on the Island and critical parking shortages that becomes more noticeable during the summer months led the Department of Transportation at the request of Community Board 10 to undertake this study to address traffic congestion, circulation, parking shortfalls and to improve safety and mobility of pedestrian and vehicular traffic.

1.1 City Island History

Starting in the early nineteenth century the Island's location on the Sound and near New York City helped to create a thriving local economy based on water-dependent industry, trade and services. The practice of oyster cultivation in the United States is said to have originated here, and was an important part of the Island's economy until pollution and politics ended it by the early twentieth century. From the middle of the nineteenth through the better part of the twentieth century, the City Island's main industry was boat building, along with ancillary trades such as sail making.

Exhibit 1-1

The Study Area in the Regional Setting

All kinds of wooden boats were built here, ranging from small skiffs to large cargo schooners. The City Island gained a reputation for the finely crafted cruising and racing yachts built and serviced here; its place in history was sealed when it built five America's Cup winners in a row. During the First and Second World Wars, City Island boatyards remained busy with Navy contract orders for small vessels such as minesweepers and landing craft. After World War II boatbuilding declined as an active industry on City Island and many of the boatyards have been converted to other uses. Today, the island is primarily residential, and is best known for its popular seafood restaurants. Several marinas, yachts clubs and marine businesses continue to operate on the Iisland. Nevertheless, over time the economy of the Island has shifted away from marine manufacturing to one dominated by marine services and restaurants.

1.2 Objective of the Study

The objective of the study is to assess 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 with the northern parts of Pelham Bay Park) during summer and non-summer conditions. The study also examines the major problematic locations in the study area, parking shortfall, queuing and congestion problems, access to the Island, and analyzes the potential impacts of future developments in the study area by 2013. The study's goal is to generate effective solutions to improve overall safety and circulation of pedestrian and vehicular traffic, alleviate congestion at critical locations and corridors, and improve parking and access to the Island.

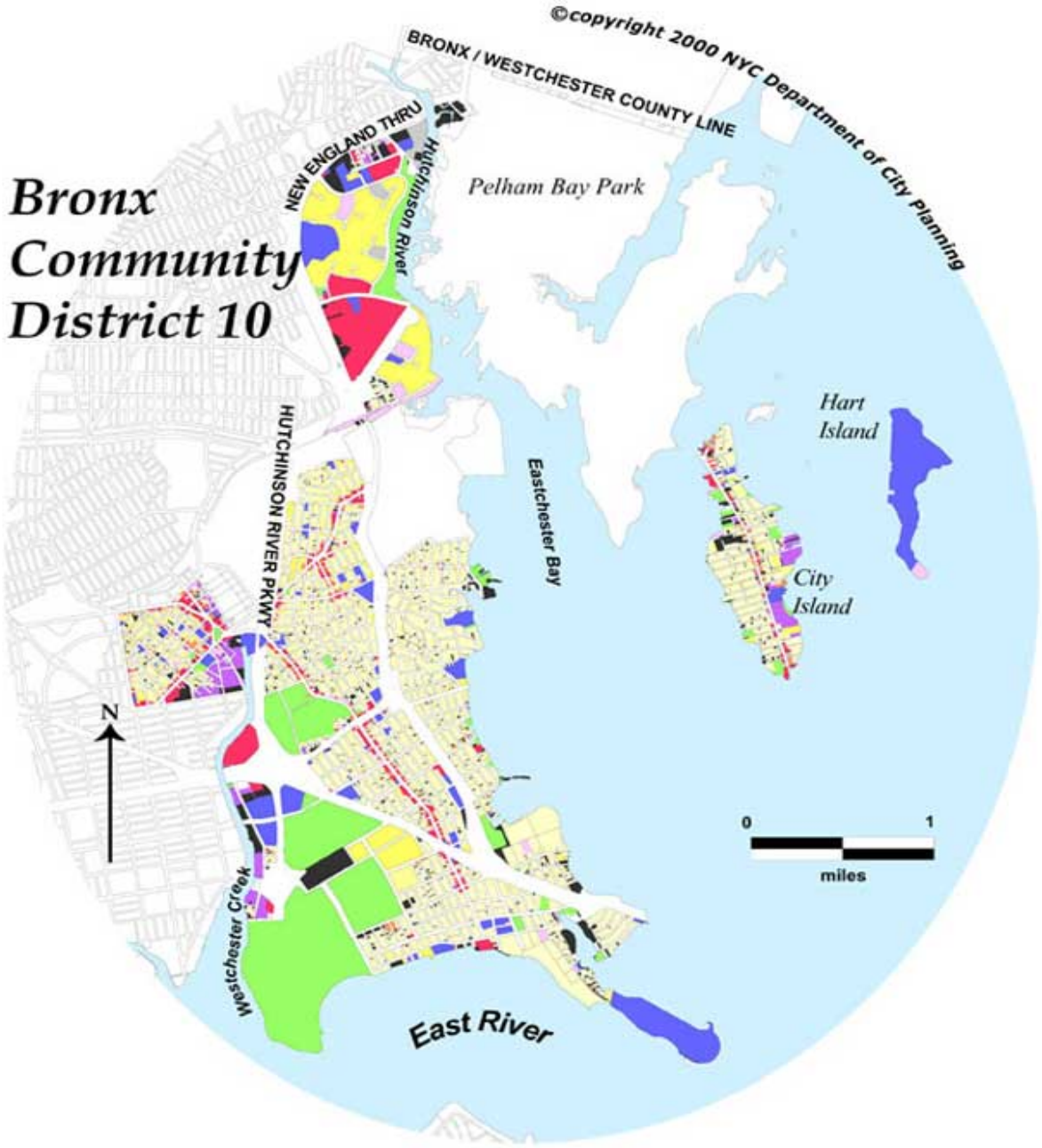
This Report includes analyses of both the existing and projected conditions for demographics, land use and zoning, traffic, parking, pedestrian, bicycles, accidents/safety and transit. The Report recommends improvement measures to improve overall traffic flow and safety of all road users. These recommendations are presented in the form of short and long-term and improvement measures.

1.3 The Study Area

The study area includes the City Island, Orchard Beach, and parts of the northern section of Pelham Bay Park. The study area 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 is located within Community District 10. Exhibit 1-2 shows the study area.

The High and Hart Islands are also part of the study area but since they are unpopulated and currently do not have significant traffic related activities, these islands are not analyzed in the report. The main arterials in the study area are City Island Avenue, City Island Road, Park Drives, Orchard Beach Road, Shore Road, Pelham Parkway and Hutchinson River Parkway. Exhibit 1-3 shows the study area's boundaries as well as major arterials and bridges (Pelham, Hutchinson River and City Island).

Exhibit 1-2
Study Area within Community District 10



1.4 Project Organization and Methodology

The study will follow the stages and process outlined below:

Task 1 - Project Organization and Management

The initiation of the study developed a public consultation program to obtain community input during the course of the study in the scoping of the analysis and for the future development of recommended measures. The Technical Advisory Committee (TAC) members were selected including various public agencies, elected officials, community board, recreational users, transportation/transit providers, customers, merchants/shoppers, businesses, marinas and yacht clubs, civic organizations and other interested parties. Table 1-1 shows the detailed work program describing tasks, subtasks, and task products and work schedule. Table 1-2 shows the organization and planning steps (process and issues) for the City Island Transportation study.

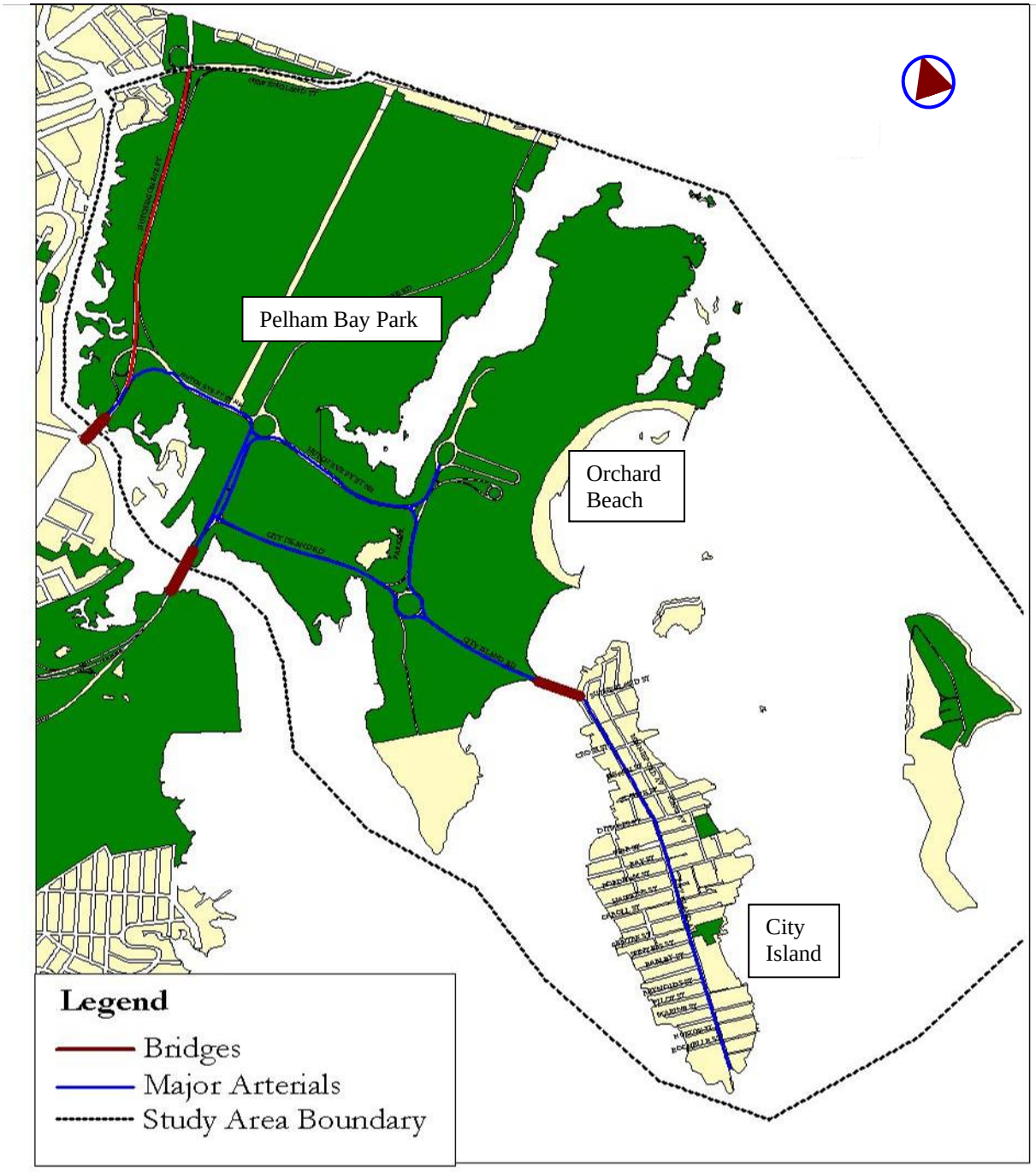
Task 2 - Literature Search

To gain some background information, previous studies related to the study area conducted within and outside the agency were reviewed. These studies include Environmental Impact Statements (EISs) and Environmental Assessment Statements (EASs) and other planning studies.

Task 3 – Data Collection and Issue Identification

Data have been collected for traffic, trucks, transit, parking, safety, pedestrians and bicycle analyses at critical intersections and corridors in the study area. The data collection includes traffic volumes, manual turning movements, vehicles classifications, and pedestrian counts for three midweek days (Tuesday, Wednesday, and Thursday), Saturday and Sunday peak hours for the most critical intersections. The analysis time hours for weekdays are: 8-9 AM, 1-2 PM midday, and 5-6 PM peaks; and weekends 1-2 PM and from 7-8 PM. Concurrently to manual counts, Automatic Traffic Recording (ATRs) machines were installed to collect daily volumes for duration of seven days. Level of Service (LOS) analyses were conducted for main intersections and corridors.

Exhibit 1- 3
Study Area Major Arterials and Bridges



Additionally data related to land use, demographics, street geometry, parking facilities, transit network and usage, accident statistics, were also collected or used from other records for the analysis. A final inventory of the 2003 existing conditions was created. Members of the Technical Advisory Committee are solicited for their input in the identification of problem areas, critical issues, and the operating effectiveness of traffic, transit, pedestrian and parking activities.

Task 4 – Analysis of Existing Conditions

The analysis of existing conditions (2003) examined demographics, land use and zoning, traffic, parking, pedestrian, transit, and good movements. It also includes level of service (LOS) analysis at the critical intersections in the study area.

Task 5 – Analysis of Future Conditions

The analysis of future conditions (2013) for traffic, parking, pedestrian, transit, and trucks and good movements was conducted and LOS determined for all relevant categories.

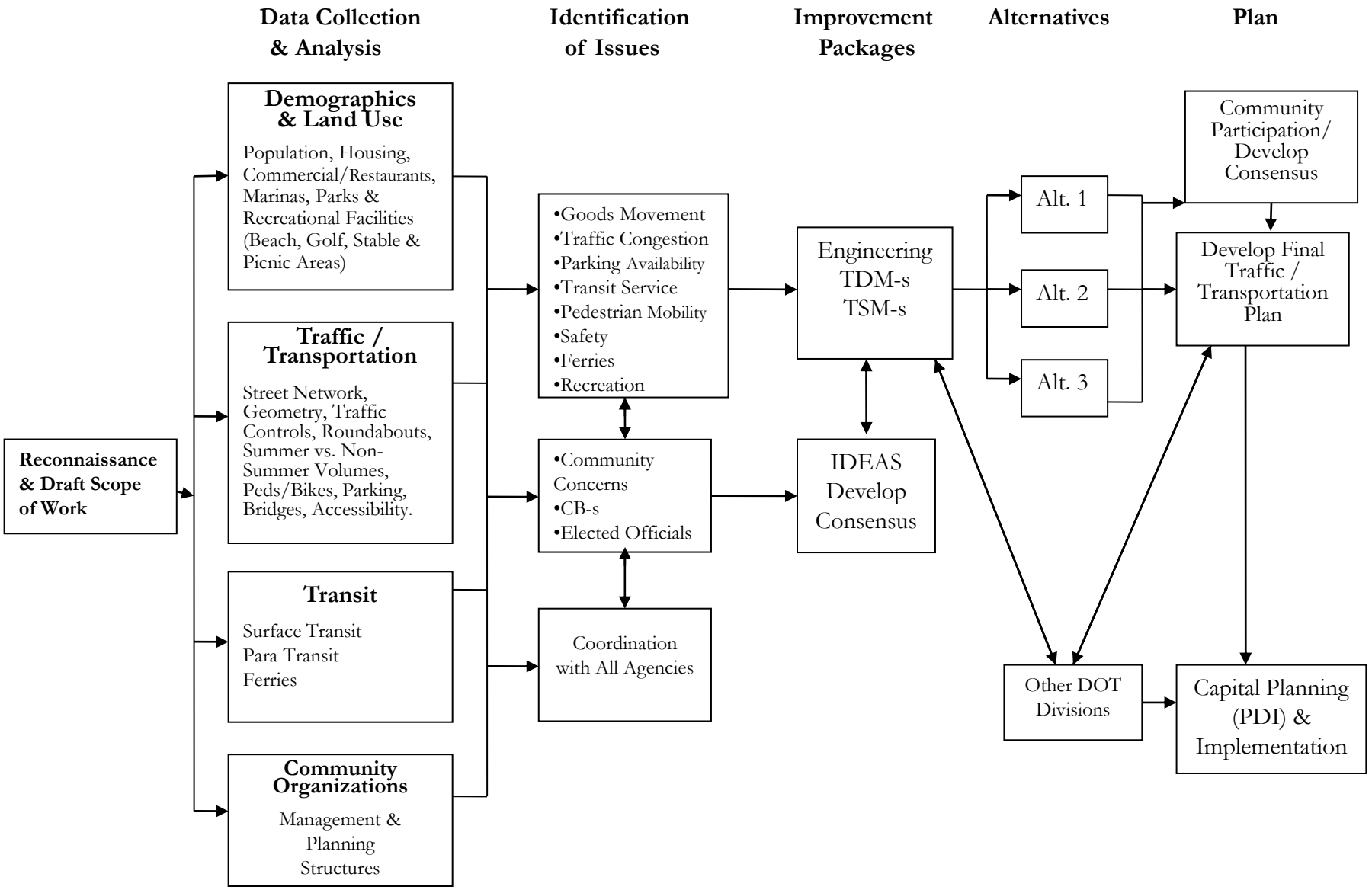
Task 6 – Recommendation and Implementation Plan/Development and Evaluation of Alternative Improvement Packages.

Various alternatives were developed and evaluated for cost, time, and relevant capital construction projects effectiveness in order to address the area's transportation needs. The TAC developed a package of long and short-term improvement options for later review. The study recommended adequate measures to improve mobility, lane accessibility, circulation and safety of pedestrian and vehicular traffic. Mitigation measures included Travel Demand Management (TDM) to reduce demand for automobile and promote public transportation and alternative modes of transportation such as bicycling and walking and/or Transportation System Management (TSM) such as changes in parking regulations, traffic signal timing, and direction of traffic flow were considered. Upon completion of these tasks, the implementation plan will be finalized.

Task 7 – Final Report

The study will prepare a detailed report of issues and recommendations regarding traffic, transit, parking, pedestrians, parking, trucks and goods movement, recreational uses and enforcement measures. The study will also recommend the preferred alternative(s) based on Task 6 and develop detailed implementation plans including costs and schedules.

Table 1-1: Organization and Planning Steps (Process and Issues)



2.0 LAND USE AND ZONING

The study inventories land uses and zoning within the study area and examines the distribution of housing density (existing and proposed), gross commercial floor area, and community facilities (schools, places of worship, senior centers, parks, cemeteries, and open spaces). It also identifies the number of major trip generators in the area to examine land uses and trend changes.

City Island's urban village pattern has low-rise and low scale houses and open water views contributing to the Island's special sense of place. While residents view some change as inevitable, residents do not wish to see the basic qualities of the Island changed beyond recognition. City Island's development as a small village community had its start around the 1830s when marine businesses and boatyards were located on the waterfront, commercial businesses clustered along the main street, and houses built on the side streets. There are five zoning districts on City Island R3-2, C1-2, C2-2, C-3, and M1-1.

The C-3 zoning "waterfront recreation" and residential district is located adjacent to the City Island bridge; there are two M1-1 districts -one on the west side of City Island Avenue around Bowne Street and the other on the east side from Marine Street to Tier Street). The R3-2 district covers the rest of the island; and there are C1-2 and C2-2 commercial overlays are located along most of City Island Avenue. Exhibits 2-1 and 2-2 show the zoning districts and land uses on City Island.

In 2001, the Department of City Planning (DCP) conducted a study (City Island Maritime Heritage Preservation Study) in collaboration with the community, and recommended the creation of the City Island Special Zoning District. DCP proposed that the zoning map be changed and text amendments to the Special City Island District. The proposal aims also to preserve City Island's low-rise/low-density character, maintain the village quality of City Island Avenue's shopping district, and enhance community access to the waterfront. These recommendations are in keeping with goals delineated in the Department of City Planning's 2001 City Island Maritime Heritage Preservation Summary Study.

Exhibit 2-1: Zoning Districts

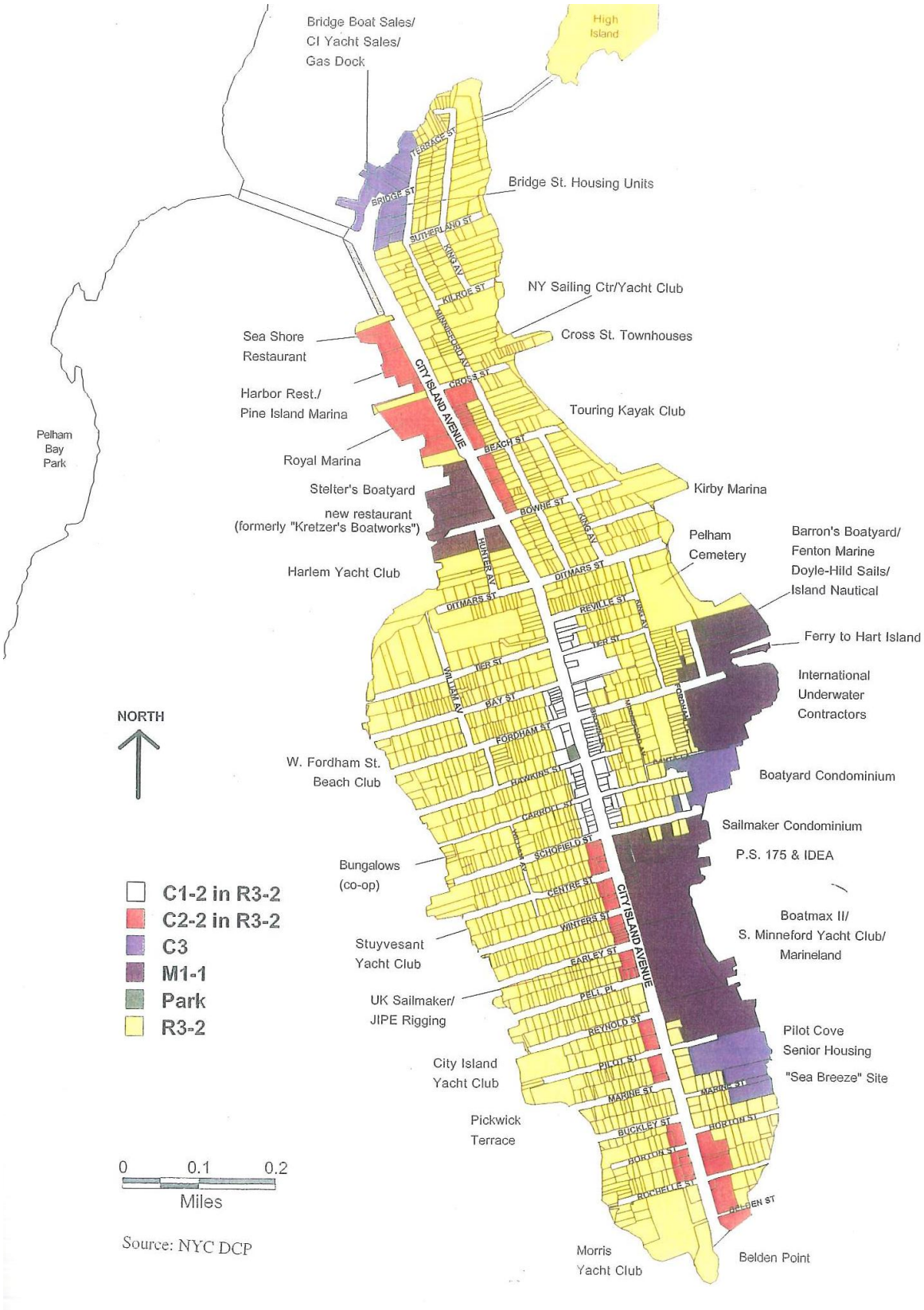
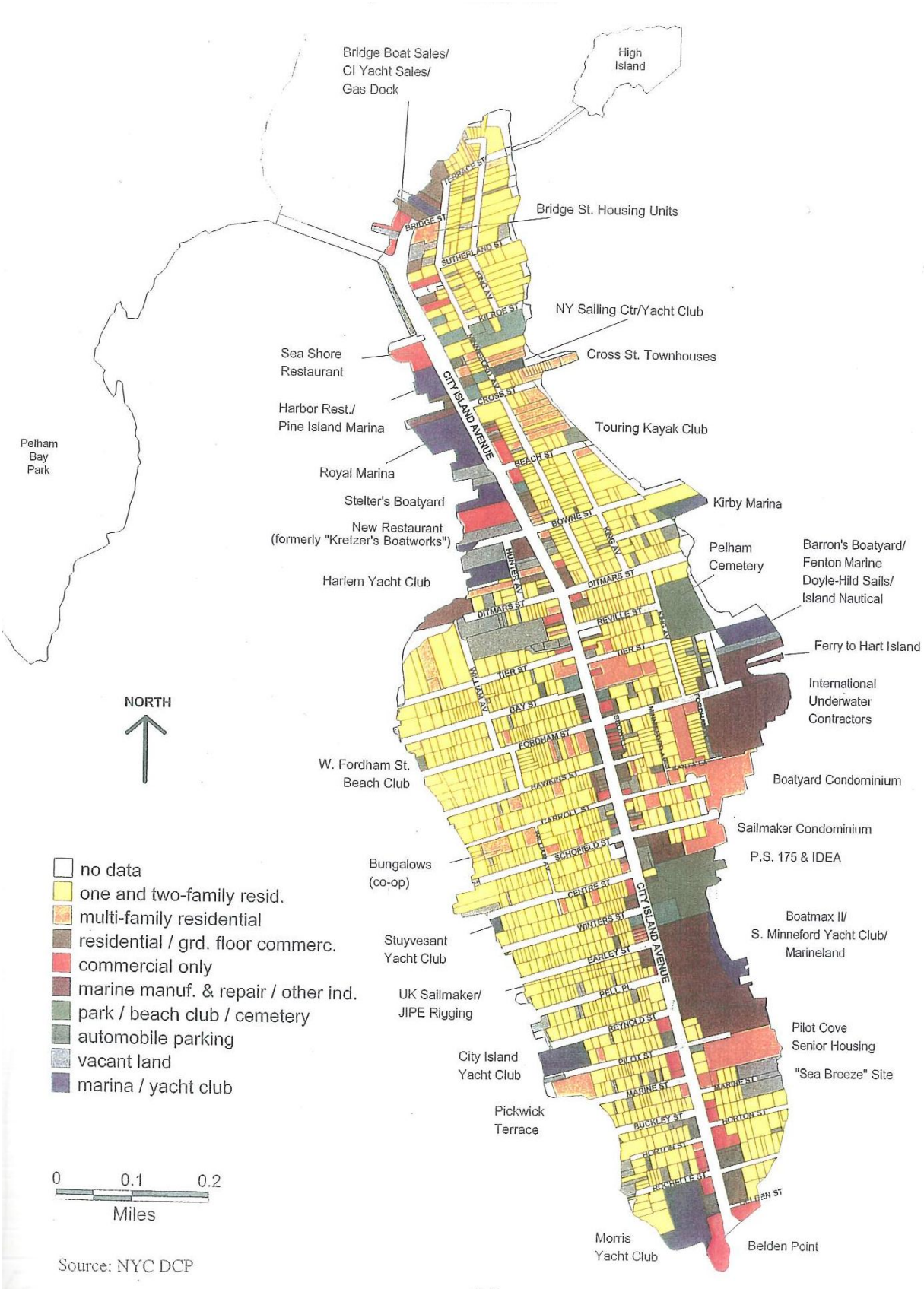


Exhibit 2-2: Land Use



There are also a number of marinas, yacht clubs and marine-manufacturing businesses that are a legacy of the Island's maritime past. Marine-related uses are located principally along the Island's waterfront areas. The following photos show Belden Point at the Island's most southern point and some of the City Island's restaurants and marinas.

A water view from Belden Point

Sea Shore Restaurant

City Island's Marinas/Yacht Clubs

Lobster House

Johnny's Sea Food Restaurant

Most of the residential areas of the City Island are zoned R3-2, the lowest density zoning district in which attached or semi-detached multiple dwellings are permitted. However, most residential buildings on the City Island are detached houses that are built at a lower density than the current zoning permits. The residential houses on the Island are low-rise and low-scale detached houses, which line narrow side streets in addition to few small apartment buildings. A majority of the lots (about 84 percent) comprise either residential or mixed (residential/commercial) use. Commercial use is approximately three percent of the City Island's land use. The Island's mainly seafood restaurants are concentrated primarily on either end of the island. The middle of the Island, between Bay and Carroll streets, has numerous mixed-use buildings with ground-floor storefronts and apartments or offices above. The following photos show mixed-use buildings along City Island Avenue and attached/detached houses on a local street.

Attached homes along City Island Avenue

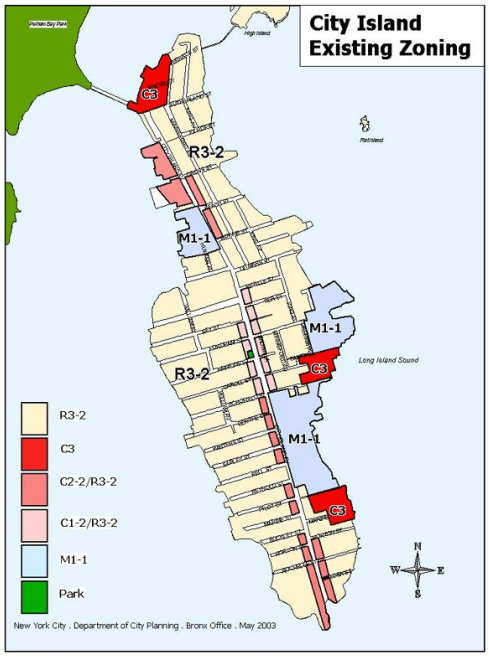
Modestly scaled detached houses

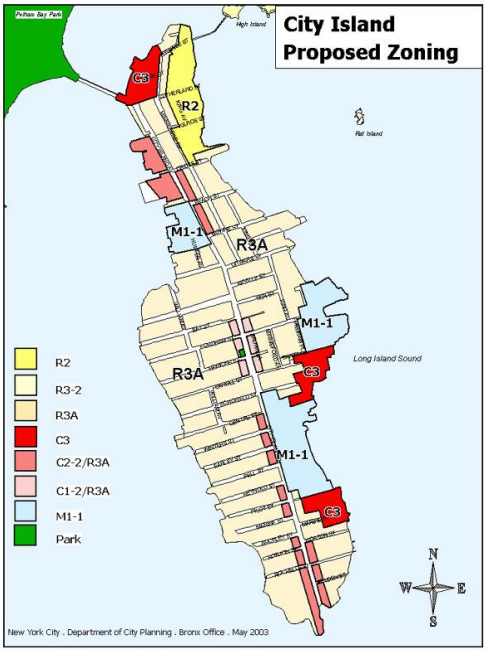
Some recent developments on the City Island include the construction of attached townhouses and multi-family dwellings that replace the single-family detached houses. The following photos show the new multi-family houses at Bridge St./Minnieford Ave. and Bowne St./King Avenue.

New Multifamily Housing at Bridge and Bowne Streets

To ensure that new developments complement the existing zoning, the Department of City Planning has proposed to rezone most of the existing R3-2 area on City Island to R3A, a district permitting only one- and two-family detached houses. A two-block the area that is characterized by large single-family suburban-style homes would be rezoned to R2.

To strengthen the existing Special City Island Zoning District, DCP proposes to amend the special zoning district text, focusing on three areas: urban design elements related to residential uses in the proposed R3A and R2 districts and commercial uses along City Island Avenue, landscaping and screening requirements for parking lots containing 10 or more spaces, and provisions for waterfront public access on new residential developments on large lots. The proposed amendments to the zoning map have been approved by the Community Board and Borough President and have been approved by the City Planning Commission. The current zoning categories now include R2, R3-2, R3A, C3, C2-2/R3A, C1-2/R3A, M1-1, and Park. The following two maps show the City Island existing and proposed zoning.





Land use in other portions of the study area (Pelham Bay Park and Orchard Beach) includes recreational facilities such as golf courses, picnic areas, a Stable, Hunter Island, the Meadow, the Barton-Pell Mansion Museum, a NYPD Firing Range, and the Thomas Pell Wildlife Sanctuary.

The following photos show Orchard Beach and the parking lots for the beach and the golf course.

Orchard Beach, looking northeast

Orchard Beach, looking southeast

Orchard Beach parking lot (6,000 spaces)

Golf Course parking lot (200 spaces)

Future Land Use and Zoning

The future land use and zoning in the study area will remain principally the same (primarily residential mixed with commercial and recreational uses) by the year 2013. However, some minor changes in land uses and zoning are expected within the study area boundaries.

The following changes in land use and zoning are anticipated in the study area by 2013.

Replacement of City Island Bridge

The replacement of the City Island Bridge, which is expected to be completed by the year 2013, will not significantly impact land use and/or zoning in the study area. A portion of the existing marina on the northeast corner of the bridge will be temporarily impacted during construction

due to the need to remove the existing east abutment and roadway approach and the construction of the proposed abutment wing wall and retaining wall. Additionally, approximately 800 square meters or 8,600 square feet of Pelham Bay Park property is anticipated to be required for the change in land use necessary to replace the existing bridge. The proposed widening of the bridge roadway will also necessitate changes to the City Map, thereby requiring a ULURP review with the New York City Department of City Planning. The proposed project will include principally only the replacement of the existing bridge without significant expansion on the present alignment including: roadway widening without increasing the number of travel lanes; enhancement of public amenities through additions and improvements to the existing pedestrian and bicycle facilities and the relocation of utilities on the new structure.

Future Residential Developments

Within the study area, particularly on the City Island, the major changes will result from ongoing development of new low density housing by 2013. Additionally, some minor changes are also expected in accessory parking supply, boatyard and marinas expansions, street and sidewalk renovations, creation of new bike or pedestrian pathways, parks and playground upgrading.

In December 2004, the New York City Department of City Planning (DCP) revealed that 22 two-family detached homes had been approved for development on City Island Avenue, between Cross and Beach Streets. The site was formerly a boatyard and marina (The Royal Marina) and the existing boat slips would be maintained thereafter. Fifty of these boat slips will be designated to the new development and remaining 70 will be leased to private users. Additionally, there will be 107 accessory parking spaces provided, of which 68 spaces are to be designated to the new development and the remaining 39 spaces to the private boat slips.

Another development consisting of 22 two-family homes on the southeast end of Fordham Street was also approved by the Department of City Planning. This action will require a zoning change action as the site is currently zoned M-1. The proposal for the project indicates that parking will be provided to residents and visitors.

3.0 DEMOGRAPHICS

3.1 Population Trends and Households

The demographic analysis for the study area examines population, age distribution, household size, employment, income, and car ownership rate for the years 1980, 1990, and 2000.

According to the 2000 Census, the total population of the City Island was 4,520, an increase of 11.5% from the 1990 population of 4,053. The median age is 42.5 with about 19.2% of the population under the age 18; 64% is between the age of 18 and 64, and about 16.8% at 65 years and over. The City Island population is stable and the median income is approximately $56,750 in 2000. According to 1990 Census data, the median household income for the City Island in 1990 was $40,727, comparing to the Bronx where the median household income was $21,944. In 1990, less than 7.3% of the City Island population had incomes, below the poverty level compared to 19.3% citywide. In 2000, only 4% of the people on the Island had incomes that fell below the poverty level. Eighty one percent of the residents over the age of 25 are high school graduates compared to 68.3% New York City.

The 2000 Census data also indicate that 92.4% of the 2,054 total housing units on the City Island are occupied 54.2% being owner-occupied and 45.8% are being tenant-occupied. The average household size is 2.2 persons per household.

Forty-five percent of the Island's labor force worked in professional and managerial fields, while 26% worked in technical, sales and administrative support occupations, and 10.4% in precision production, craft and repair operations. On the Island itself, a majority of businesses are related either to boating and marine services or to seafood restaurants that serve the large number of tourists who visit the Island in the summertime.

Table 3-1 provides demographic trends of the study area.

Table 3-1

Demographic and Socio-Economic Characteristics

Total Population		
Year	Residents	% change
1980	4,163	-
1990	4,053	-2.64
2000	4,520	11.52
Total Change (1980-2000)		8.58

Total Households		
Year	# of houses	% change
1980	1,674	-
1990	1,748	4.42
2000	2,054	17.51
Total Change (1980-2000)		22.70

By Median Income		
Year	Value ($)	% change
1980	19,653	-
1990	40,727	107.23
2000	56,750	39.34
Total Change (1980-2000)		188.76

Average Value of House		
Year	Value ($)	% change
1980	54,900	-
1990	211,800	285.79
2000	272,100	28.47
Total Change (1980-2000)		395.63

Average Rent		
Year	Value ($)	% change
1980	309	-
1990	525	69.90
2000	798	52.00
Total Change (1980-2000)		158.25

Population in Poverty		
Year	# of people	% change
1980	157	-
1990	294	87.26
2000	181	-38.44
Total Change (1980-2000)		15.29

Population by Age			
Age	1980	1990	2000
0-19	1,031	636	870
20-64	2,492	2683	2,892
65+	640	734	758
Total	4,163	4,053	4,520

By Household Size			
# of Persons	1980	1990	2000
1 Person	439	602	768
2 P	498	544	623
3 P	254	261	323
4 P	208	200	193
5 P	124	90	101
6 P	53	35	41
7 P+	25	16	5

3.2 Vehicle Ownership Rate

The analysis shows that households without a vehicle in the study area (City Island) decreased significantly from 397 to 288 (38%); households with one vehicle decreased from 798 to 679 (18%), while households with two, three or more vehicles increased from 353 to 624 (43%) and 74 to 183 (60%) between 1980 and 1990, respectively. Between 1990 and 2000, the households with no vehicles for the study area (City Island) increased significantly from 288 to 364 (21%), households with one vehicle increased from 679 to 944 (28%), while households with two and three and more vehicles decreased from 624 to 578 (8%) and 183 to 165 (11%). Overall, between 1980-2000 the vehicle ownership rate (total number of vehicles owned by household) for the City Island households without vehicles decreased from 397 to 364 (9%), while the households with 1, 2, and 3+ vehicles significantly increased from 798 to 944 (15%), from 353 to 578 (39%) and 74 to 165 (55%). Table 3-2 shows the vehicle ownership per household and travel by mode on City Island for the three analyzed decades.

Table 3-2
Vehicle Ownership Rate

By Vehicle Ownership						
No. of Vehicles	**1980**	**1990**	% Change (1980-90)	**2000**	% Change (1990-00)	% Change (1980-00)
0	397	288	-27.46	364	26.39	-8.31
1	798	679	-14.91	944	39.03	18.30
2	353	624	76.77	578	-7.37	63.74
3+	74	183	147.30	165	-9.84	122.97

In conclusion, the demographics analysis reveals a significant increase in the study area's population and households over the last three decades, which coincides with a demand in auto ownership.

3.3 Travel by Mode

The demographic analysis shows that the population, households and vehicle ownership rates are increasing on City Island. Compared to NYC, City Island residents will more likely use the automobiles rather than other transportation modes such as public transportation (buses and subway/railroad located nearby). Table 3-3 compares the transportation mode choices of City Island residents for the years 1980, 1990, and 2000.

Table 3-3
Travel Modes

By Travel Mode									
Travel Mode	**1980**	%	**1990**	%	% Change (1980-90)	**2000**	%	% Change (1990-00)	% Change (1980-00)
Drive Alone	750	40.96	1,185	59.28	58.00	1,534	64.29	29.45	104.53
Carpool	296	16.17	258	12.91	-12.84	253	10.60	-1.94	-14.53
Bus	223	12.18	105	5.25	-52.91	86	3.60	-18.10	-61.43
Subway/R.R.	206	11.25	242	12.11	17.48	276	11.57	14.05	33.98
Walk	315	17.20	85	4.25	-73.02	146	6.12	71.76	-53.65
Other	41	2.24	124	6.20	202.44	91	3.81	-26.61	121.95
Total	1,831	100	1,999	100		2,386	100		

The Census Journey To-and-From Work travel data indicates that automobiles have been the predominant mode of transportation for City Island residents. Of the total trips made to and from the island, 41%, 59.3% and 64.3% in 1980, 1990, and 2000 used cars as the mode of travel.
While use of the private auto clearly increased, use of other modes decreased. For 1980, 1990, and 2000 - 11.25%, 12.1%, and 11.5% used subway/railroad, 12.18%, 5.25% and 3.6% used bus service, 16.16%, 12.9%, and 10.6 % carpooled, 17.2%, 4.25, and 6.1% walked, and 2.24%, 6.2%, and 3.8% used "other" means/modes to complete their trips in 1980, 1990, and 2000, respectively.

The analysis shows that between 1980 and 2000 there was 51% increase in the number of residents who 'Drove alone' to complete their trips in the study area. Bus service has been reduced significantly by 159% during the same period while the 'Subway/Railroad' services

(with their stations outside the study area) have increased by 25%. 'Walking' to and from the island has been reduced significantly by 116% while 'Carpooling' has been reduced by 17% for the same period (between 1980 and 2000). The number of residents using 'Other' modes of transportation increased by 55% for the same period. Unlike other city residents, who primarily use mass transit to complete journey to work trips, a significant portion of City Island residents depend on private cars to complete their journey to work trips.

3.4 Future Demographic Trends

Population and Households

The analysis of existing demographic conditions examined population growth/decline, age distribution, household size, employment, income, and car ownership rate for the years 1980, 1990, and 2000 to identify trends to determine the study area's needs. The future demographics for population and household are projected with growth/decline and car ownership rate for the year 2013.

Based on the analysis of existing demographic characteristics, it is expected that the scio-economic characteristics of the study area will slightly change by 2013. Comparing the historical trends of the study area for the last three decades (1980, 1990, and 2000) and adding up all potential developments that might occur in the study area by the year of 2013 (such as 44 new residential units are scheduled to be built on City Island before 2013), it is projected that the study area's population would increase by approximately 8.58% between 2000 and 2013. The study area's population growth would be similar to both New York City and the Bronx whose populations are also projected to increase by 6.16% and 6.94%, respectively. Overall, for the period 1980-2013, the study area is expected to experience a total population increase of 17.9% while New York City and the Bronx are projected to experience a net population increase of 20.22% and 21.92%, respectively. Hence, population growth trend in the study area is slightly less than to New York City and the Bronx.

Table 3-4 shows the existing and projected population for New York City, the Bronx, and the study area by comparing the Census years from 1980 to projected 2013.

Table 3-4: Population By Area

Census Year/ Geographic Unit	1980	1990	% Change 1980-1990	2000	% Change 1990-2000	Projected Population 2013	% Change 2000-2013	% Change 1980-2013
New York City	7,071,639	7,322,564	3.55	8,008,278	9.36	8,501,645	6.16	20.22
Borough of Bronx	1,168,972	1,203,789	2.98	1,332,650	10.7	1,425,170	6.94	21.92
Study Area	4,163	4,053	-2.64	4,520	11.52	4,908	8.58	17.90

Projected Vehicle Ownership Rate

As the study area's population increase, a simultaneous growth in auto ownership and number of households is also expected. The average density for new residential developments (44 units) planned for the year 2013 would be 3.7 persons per unit. The average automobile ownership measured is expected to be 1.6 vehicles per unit (Trip Generation, ITE, 7th Edition). Table 3-5 compares the vehicle ownership rates of the study area from 1990 to projected 2013. Between 2000 and 2013, the total number of households in the study area is projected to increase from 2,054 to 2,154 (4.87%).

Table 3-5
Projected Vehicle Ownership Rate

	Study Area					
Vehicles/ Household	**1990**	**2000**	**% Change (1990-2000)**	**Projected 2013**	**% Change (2000-2013)**	**% Change (1990-2013)**
Households	1,748	2,054	17.5	2,154	4.87	23.23
Zero	288	364	26.39	352	-3.3	22.22
One	679	944	39.03	1,025	8.6	50.95
Two	624	578	-7.37	628	8.65	0.64
Three or More	183	165	-9.84	179	8.5	-2.18
Total Vehicles Owned	1,486	1,687	13.5	1,833	8.65	23.35

The analysis shows that between 2000 and 2013, the households with no vehicles in the study area (City Island) would decrease from 364 to 352 (3.3%), households with one vehicle would increase from 944 to 1,025 (8.6%), while households with two, three and more vehicles would increase from 578 to 628 (8.65%) and from 165 to 179 (8.5%), respectively.

Overall, vehicle ownership rate for the City Island households with no vehicles is projected to increase from 288 to 352 (22.22%), while the households with 1, 2, and 3+ vehicles would significantly increase or slightly increase/decrease from 679 to 1025 (50.95%), from 624 to 628 (0.64%) and from 183 to 179 (2.18%) between 1990 and 2013.

In conclusion, the demographic analysis reveals a significant increase in the study area's population and households over the last three decades, which coincides with a demand in auto ownership that will continue to 2013.

Travel by Mode

The demographic analysis indicates that the population, households and vehicle ownership will most likely increase on City Island by 2013. Contrary to the rest of the City, the dependence of City Island residents on the private auto is expected to continue. Table 3-6 shows the travel by mode trend in the study area in the future compared to 2000. The study area is expected to continue attracting a number of recreational trips in the summer.

Table 3-6
Projected Travel by Mode

Travel Mode	**2000**	%	Projected **2013**	%	% Change (2000-13)	% Change (1980-13)
Drive Alone	1,534	64.29	1,692	65.30	10.3	225.6
Carpool	253	10.60	233	9.00	-7.9	-21.28
Bus	86	3.60	95	3.67	10.46	-57.4
Subway/R.R.	276	11.57	320	12.35	15.94	55.34
Walk	146	6.12	156	6.02	6.85	-50.48
Other	91	3.81	95	3.66	4.4	231.7
Total	2,386	100	2,591	100		

The journey-to-and-from-work travel data (analyzing the years of 1990 and 2000) indicates that automobiles are the predominant mode of transportation for City island residents and visitors. Similarly, it is expected that the automobile will continue to be a dominant mode of transportation in 2013.

Of the total projected trips that will be made to and from the island by 2013, 65.3% will use cars as the only mode of travel. Approximately, 12.35% of the total number of projected trips that will be made in the study area will use subway or railroad (located outside the study area), 3.67% will use bus service, 9% will carpool, 6% will walk, and 3.5% will use other mode of transportation.

The analysis shows that 'Drive Alone' for the study area would increase significantly by 225.6% between 1980 and 2013. Bus service will be reduced by approximately 57.4% in the study area during the same period while the 'Subway/Railroad' services (with their stations outside the study area) will increase by approximately 55.4%, respectively. 'Walking' to and from the island will be reduced significantly by 50.48% while 'Carpooling' will be reduced by 21.28% for the same period (between 1980 and 2013). The mode "Other" will gain some of trips and will increase by approximately 231.7% for the same period.

4.0 TRAFFIC AND TRANSPORTATION

4.1 Introduction

City Island is one of the most popular destinations in the City and is a recreational attraction for people who like seafood, yachts, marinas, fishing, and other water-related activities. Visitors travel from all over the five boroughs to reach the Island's most popular facilities, particularly during the summer months. Recreational activities (swimming, jogging, biking, horse riding, playground and golf courses, etc.) in the Pelham Bay Park and at Orchard Beach also attract a lot of visitors and contribute to the congestion, parking shortfalls, and traffic circulation problems in the study area.

Vehicular traffic on the only access route to the Island (over City Island Bridge) during summer peak hours (evenings and weekends) is extremely heavy. Queues are often being long in search of parking. In the evening and weekend peak periods, traffic is very heavy on the Island's main thoroughfare, City Island Avenue, which has one through-moving lane and one parking lane in each direction. City Island Avenue is the Island's only signalized arterial with three major signalized intersections -Cross, Fordham and Winters Streets. It extends from City Island Bridge (northern extreme) to Belden Point (southern tip). There are a few minor arterials that run parallel to City Island Avenue; they include Minnieford and King Avenues (located in the northern-eastern half of the Island), and William and Hunter Avenues (located in the central-western half of the Island). These only north-south arterials are principally reserved for local residents and do not carry a significant amount of traffic. All other local streets run two-way in east-west directions and most of them dead ends at the waterfront.

The study area has three distinct classes of functional roadway:

1. The major arterials carry heavy volumes and a high percentage of through traffic; the streets in the study area that meet this criteria are:
   - City Island Avenue/City Island Road
   - Pelham Parkway/North Shore Road, and
   - Park Drives

2. The minor arterials serve both through traffic and local residents; the following streets fulfill this function in the study area:
    - King Avenue
    - Minnieford Avenue, and
    - William/Hunter Avenues.

3. The local residential streets serve only local residents; these include all the other streets not named above.

Various traffic data including vehicle classifications (i.e., auto, bikes, trucks, and buses), turning movement and pedestrian counts for one midweek day (Tuesday or Wednesday or Thursday) during the AM, Midday, and PM peak hours as well as during the Saturday/ Sunday midday and PM peak hours were collected at major intersections in the study area. Data collection was conducted during both pre-seasonal (March-April 2003) and seasonal (July-August 2003) periods. Since the seasonal data is significantly higher than pre-seasonal data, it was used for analysis. Truck routes with loading/unloading stations, travel time runs along major corridors, and parking utilization rates (off-street and on-street) along the major arterials were also collected and analyzed. The study also inventoried street geometry, including block lengths, sidewalk widths, crosswalks, traffic flow directions, traffic controls, truck and bus routes, etc.

Manual turning movement (left-through-right) and pedestrian (crosswalk and corner) counts were conducted during the weekday (Tuesday, Wednesday, or Thursday) and Saturday/ Sunday for the following peak hours:

<u>Weekday:</u>

- AM Peak Hour 8:00-9:00
- Midday Peak Hour 1:00-2:00
- PM Peak Hour 5:00-6:00

<u>Weekend:</u>

- Saturday Midday Peak Hour 1:00-2:00
- Saturday PM Peak Hour 6:00-7:00
- Sunday Midday Peak Hour 1:00-2:00
- Sunday PM Peak Hour 6:00-7:00

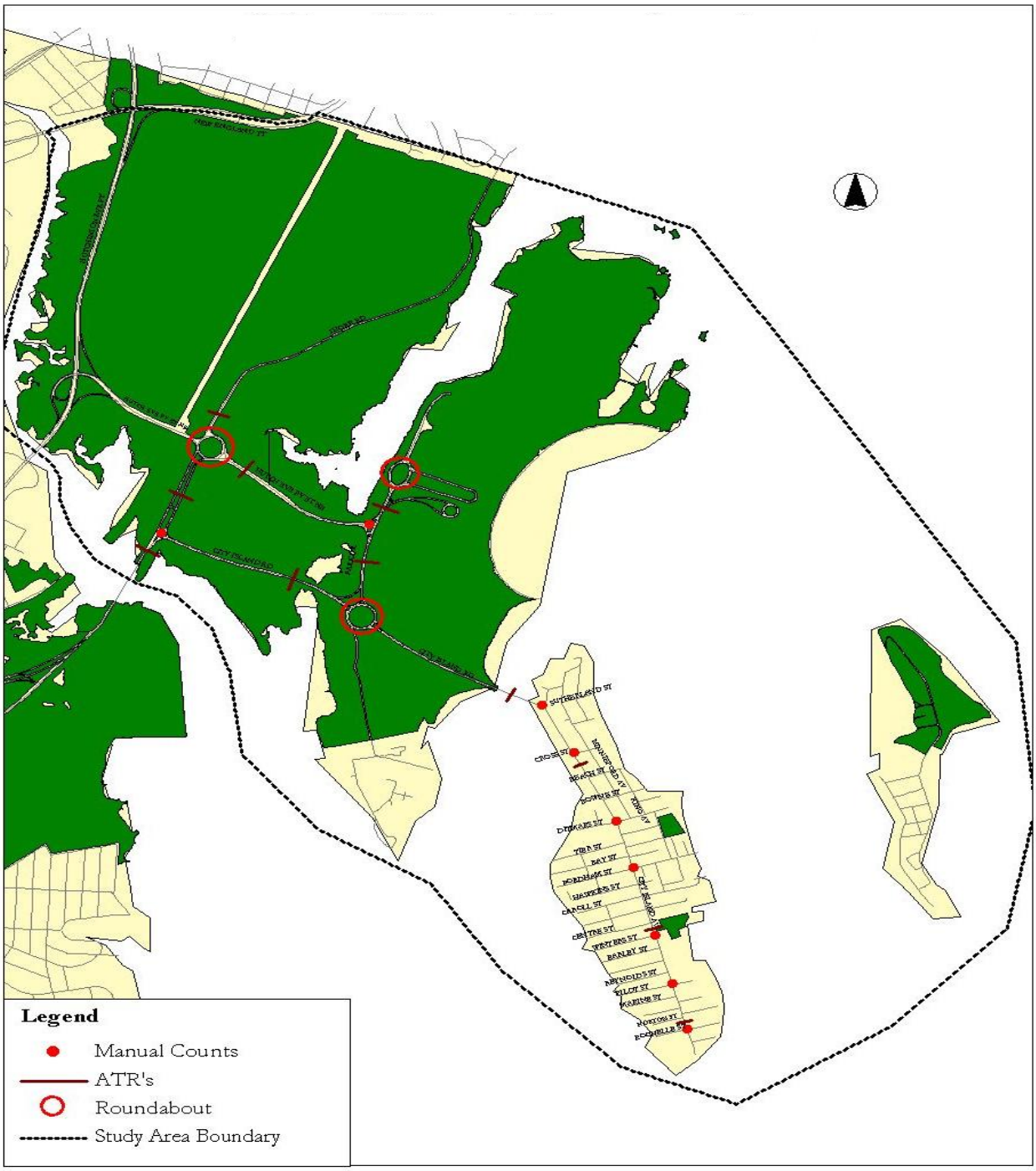
Automatic Traffic Recorder (ATR) machines were also installed for seven days (24 hours) at eleven critical locations in the study area in coordination with manual turning movement counts and travel time runs. Exhibit 4-1 shows the ATR and manual turning movement locations selected for counts and analysis.

The delay and level of service (LOS) analysis was conducted utilizing the Highway Capacity Manual (HCM) methodology for signalized and unsignalized intersections. The analysis also included three major roundabouts in the study area (located within Pelham Bay Park), which was analyzed with other software and methodologies (SYDRA and SYNCHRO/SimTraffic) to determine operating conditions at these locations.

The HCM methodology was used to determine capacity and LOS for lane groups and intersection approaches, and the LOS for the isolated intersection as a whole. Capacity is evaluated in terms of the ratio of demand flow rate to capacity (v/c ratio), whereas LOS is elevated on the basis of control delay per vehicle. In addition to the HCM methodology, the SYNCHRO/SimTraffic methodology was utilized to analyze conditions at the three major roundabouts in the study area because it has the capability to analyze roundabouts without a limit on the number of intersections and approaches. SYNCHRO was also used to model and optimize traffic signal timings, unsignalized intersections, and arterial analysis. SYNCHRO is macroscopic traffic software that provides a complete implementation of the 2000 HCM and replicates the signalized intersection capacity analysis as specified in the 2000 HCM. As companion software, SimTraffic is a microscopic simulation model used to simulate a variety of traffic controls and network settings. Additionally, SYDRA was used as a supplement to SYNCHRO to better evaluate the circulation at the roundabouts.

Exhibit 4-1

ATR and Manual Counts Locations



The following nine intersections and three roundabouts were analyzed:

1. City Island Avenue & Bridge Street
2. City Island Avenue & Cross Street
3. City Island Avenue & Ditmars Street
4. City Island Avenue & Fordham Street
5. City Island Avenue & Winters Street
6. City Island Avenue & Pilot Street
7. City Island Avenue & Rochelle Street
8. Park Drives and Orchard Beach Triangle
9. Pelham Parkway/Shore Road and City Island Road
10. Roundabout 1 (North Shore Roads/Park Drive and Hutchinson Parkway ramp)
11. Roundabout 2 (City Island Road and Park Drive)
12. Roundabout 3 (Park Drive/Orchard Beach Parking Lot Drives)

4.2 Network Traffic Volumes

The traffic network was prepared using the ATR and the manual turning movement counts to create a balanced traffic network for each peak hour. Exhibits 4-2, 4-3, and 4-4 shows the traffic volumes for weekday AM, midday and PM peak hours, the Saturday midday and PM peak hours, and the Sunday midday and PM peak hours, respectively.

The highest volumes were observed along City Island Avenue/City Island Road, Pelham Parkway/Shore Road, and Park Drives. Traffic volumes entering City Island (on City Island Bridge) were 238, 510, and 833 during the weekday AM, midday and PM peak hours, respectively; 774 and 1015 vehicles entering during the Saturday midday and PM peak hours, respectively; and 842 and 968 vehicles entering during the Sunday midday and PM peak hours, respectively. Traffic volumes exiting City Island (on City Island Bridge) were 445, 494, and 555 during the weekday AM, midday and PM peak hours, 477 and 878 vehicles during the Saturday midday and PM peak hours; and 537 and 975 vehicles during the Sunday midday and PM peak hours, respectively.

Traffic volumes recorded at the end of City Island, entering Belden Point, were 33, 167, and 250 during the weekday AM, midday and PM peak hours, respectively; 265 and 591 vehicles during

the Saturday midday and PM peak hours, respectively; and 320 and 653 vehicles during the Sunday midday and PM peak hours, respectively. Traffic volumes recorded at the end of City Island, exiting Belden Point, were 19, 170, and 180 during the weekdays AM, midday and PM peak hours, respectively; 176 and 571 vehicles during the Saturday midday and PM peak hours, respectively; and 249 and 600 vehicles during the Sunday midday and PM peak hours, respectively.

Traffic volumes entering Pelham Bay Park (via Pelham Parkway Draw Bridge) were 385, 548, and 721 during the weekday's AM, midday and PM peak hours, 1222 and 1137 vehicles entering during the Saturday midday and PM peak hours, and 647 and 437 vehicles entering during the Sunday midday and PM peak hours, respectively. Traffic volumes exiting Pelham Bay Park (via Pelham Parkway Draw Bridge) were 385, 748, and 807 during the weekday AM, midday and PM peak hours, 598 and 1169 vehicles during the Saturday midday and PM peak hours, and 1275 and 1178 vehicles during the Sunday midday and PM peak hours, respectively.

Traffic volumes entering Pelham Bay Park (via North Shore Road) were 216, 352, and 492 during the weekday AM, midday and PM peak hours; respectively; 436 and 714 vehicles entering during the Saturday midday and PM peak hours, respectively; and 429 and 781 vehicles entering during the Sunday midday and PM peak hours, respectively. Traffic volumes exiting Pelham Bay Park (via North Shore Road) were 252, 407, and 347 during the weekday AM, midday and PM peak hours, respectively; 700 and 344 vehicles during the Saturday midday and PM peak hours, respectively; and 714 and 380 vehicles during the Sunday midday and PM peak hours, respectively.

Traffic volumes entering Pelham Bay Park (from Hutchinson Parkway) were 232, 404, and 653 during the weekday AM, midday and PM peak hours, respectively; 570 and 644 vehicles entering during the Saturday midday and PM peak hours, respectively; and 838 and 482 vehicles entering during the Sunday midday and PM peak hours, respectively. Traffic volumes exiting Pelham Bay Park (via Hutchinson Parkway) were 323, 464, and 400 during the weekday AM, midday and PM peak hours, respectively; 456 and 776 vehicles during the Saturday midday and PM peak hours, respectively; and 207 and 678 vehicles during the Sunday midday and PM peak hours, respectively.

Exhibit 4-2

Existing Traffic Volumes
Weekday Peak Hours (AM, MD and PM)

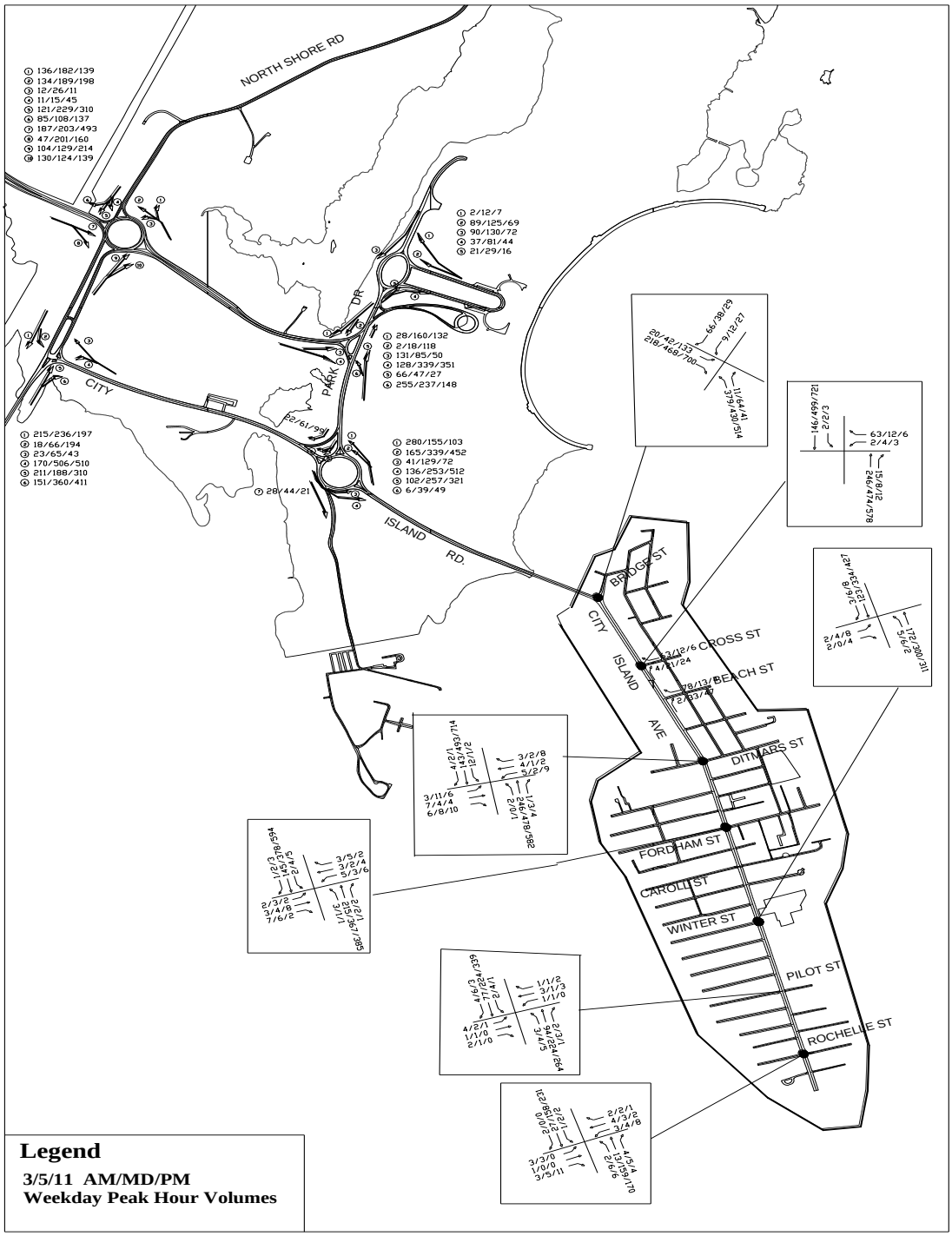


Exhibit 4-3
Existing Traffic Volumes
Saturday Peak Hours (MD and PM)

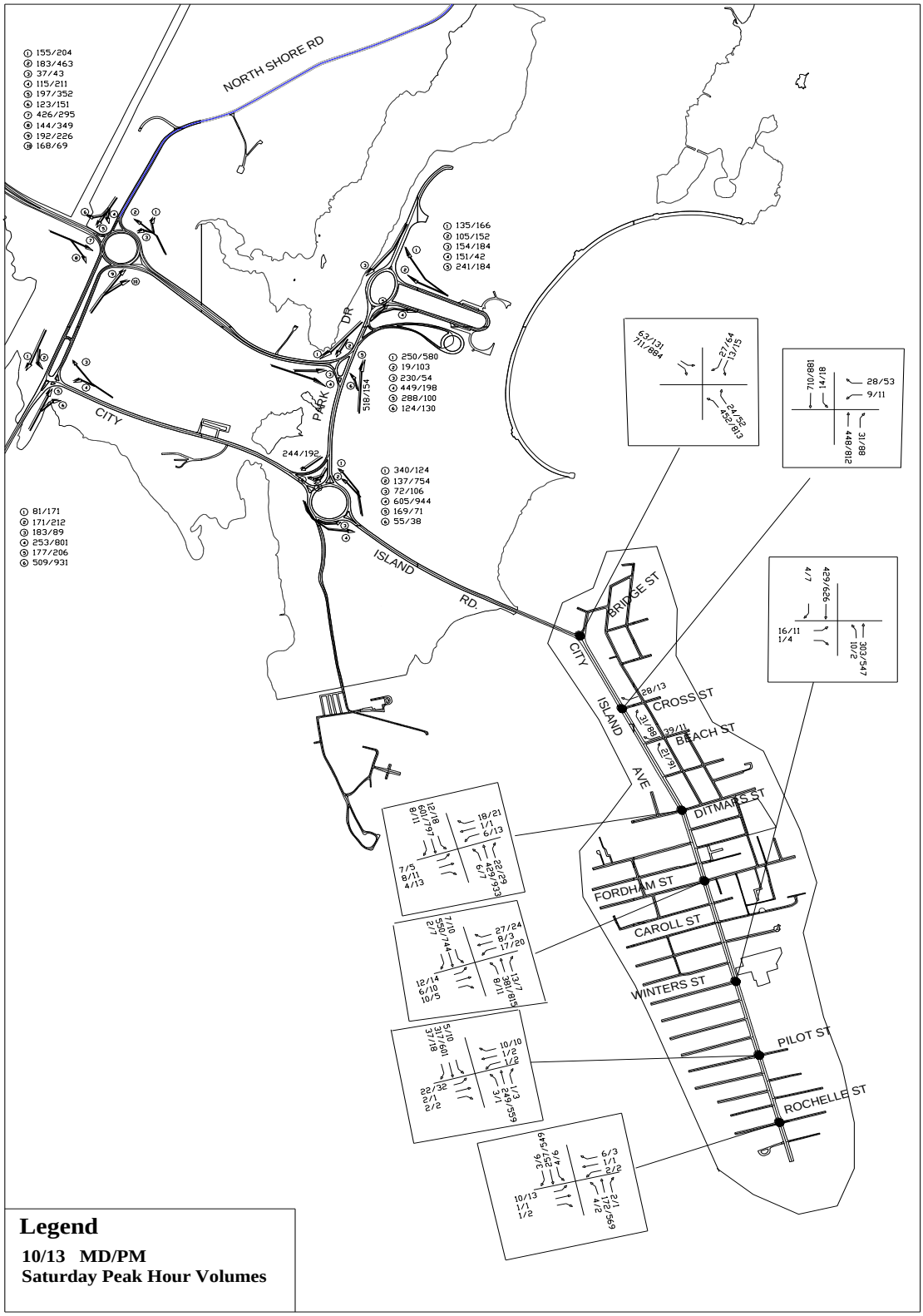
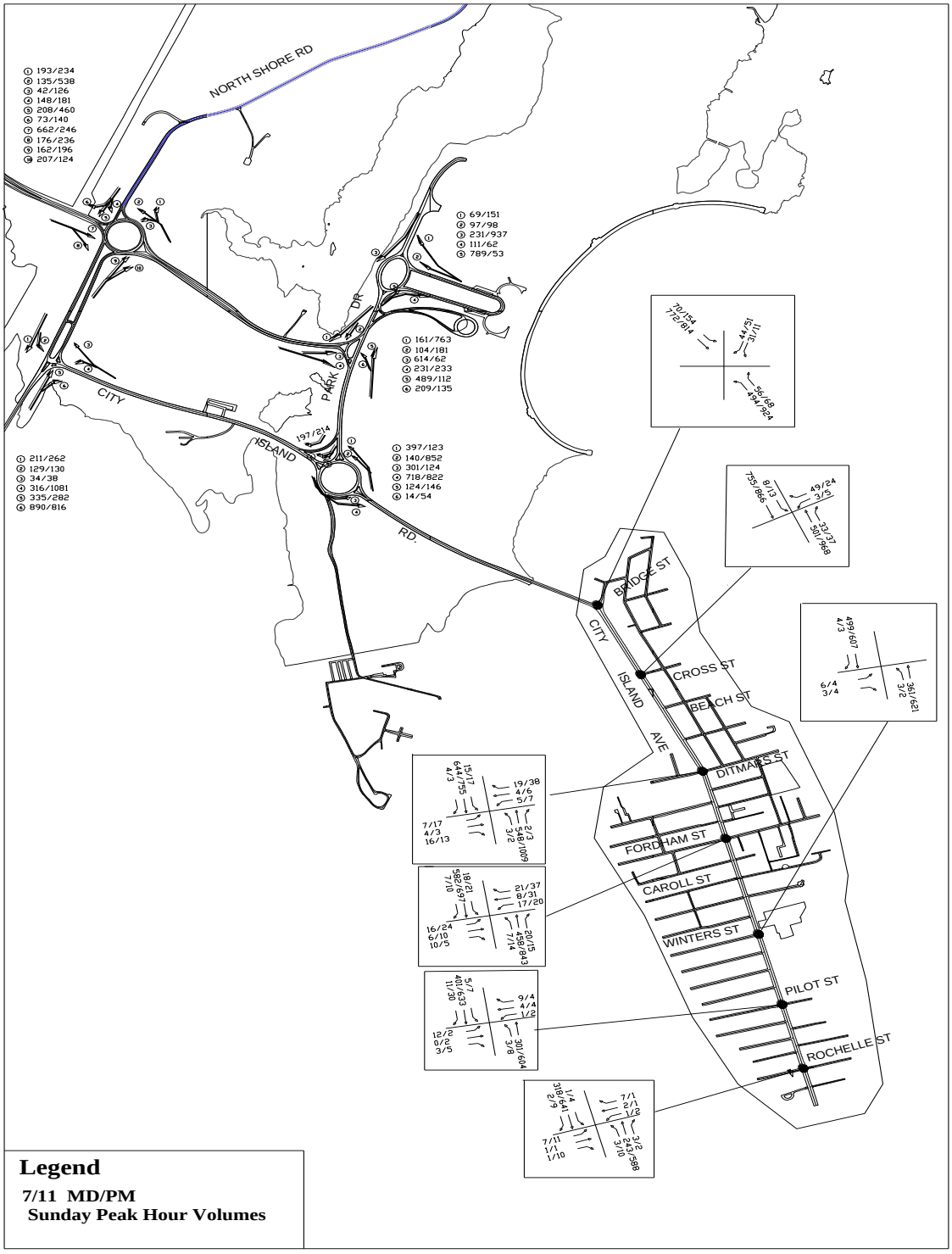


Exhibit 4-4
Existing Traffic Volumes
Sunday Peak Hours (MD and PM)



4.3 Street Capacity and Level of Service (LOS)

Traffic flow characteristics are measured in terms of volume-to-capacity (v/c) ratios and delays. The quality of traffic flow is described in terms of level of service (LOS). Levels of service range from A (ideal conditions) to F (the congested conditions). Levels of service for signalized intersections are defined in terms of average delay per vehicle. Delay is a measure of driver discomfort, frustration, fuel consumption, and lost travel time.

The capacity of a roadway is defined as the maximum rate of flow passing through the certain point on the roadway (intersection). The capacity of a roadway or intersection is determined by factors based on the peak hour volumes, turning movements, traffic composition, existing street geometry, signal timing, pedestrian movements, grade, and parking. Capacity analysis was conducted at 12 intersections in the study area. Table 4-1 shows the level of service criteria for signalized intersections as specified by the 2000 HCM methodology. Control delay for the signalized intersection includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. In contrast, in previous versions of the HCM (1994 and earlier), delay included only stopped delay.

Table 4-1
Level of Service Criteria for Signalized Intersections

Level of Service LOS	Control Delay Per Vehicle	Description of Traffic Condition
A	**≤ 10.0**	Describes operations with very low control delay, up to 10 seconds per vehicle. This level of service occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.
B	**10.1 to 20.0**	Describes operations with control delay greater than 10 and up to 20 sec. per vehicle. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of average delay.
C	**20.1 to 35.0**	Describes operations with control delay greater than 20 and up to 35 sec. per vehicle. These higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.
D	**35.1 to 55.0**	Describes operations with control delay greater than 35 and up to 55 sec. per vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	**55.1 to 80.0**	Describes operations with control delay greater than 55 and up to 80 sec. per vehicle. This level of service is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent occurrences.
F	**> 80**	Describes operations with control delay in excess of 80 sec. per vehicle. This level, considered to be unacceptable to most drivers, often occurs with oversaturation, that is, when arrival flow rates exceed the capacity of the intersection. It may also occur at high v/c ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factor to such delay levels.

Sources: Highway Capacity Manual, Special Report 209, Third Edition, Transportation Research Board, National Research Council, Washington, D.C. 2000.
New York City Department of Transportation
New York State Department of Transportation

Table 4-2 shows the level of service (LOS) criteria for Two-Way Stop Control (TWSC) intersections (unsignalized intersections).

Table 4-2
Level of Service for Two-Way Stop Control (TWSC) Intersections

Level of Service	Average Total Delay (Sec/Vehicle)
A	≤ 10
B	> 10 and ≤15
C	> 15 and ≤25
D	> 25 and ≤35
E	> 35 and ≤50
F	> 50

Total delay and LOS is determined by the computed or measured control delay and is defined as the total elapsed time from when a vehicle stops at the end of the queue until the vehicle departs from the stop line for each movement; this time includes the time required for the vehicle to travel from the least-in-queue position. The average total delay for particular minor movement is a function of the service rate or capacity of the approach and the degree of saturation.

Average total delay less than 10 seconds per vehicle is defined as Level of Service (LOS A) with no conflicting traffic for a minor movement. A total delay of 50 seconds per vehicle and above is assumed the break point between LOS E and F. LOS is not defined for the TWSC intersection as a whole.

The LOS criteria for TWSC intersection are somewhat different from the criteria for signalized intersections primarily because different transportation facilities create different driver perceptions and behavior. The signalized intersection is designed to carry higher volumes and experience greater delay than an unsignalized intersection.

The LOS criteria for All-Way Stop Control (AWSC) intersection is not included in this report because the intersections found in the study area are all TWSC. Most of these TWSC intersections are found at City Island Avenue crossing local streets, which are all located on the island and the study also included three roundabouts, all located in the Pelham Bay Park. The roundabouts are also characterized as TWSC intersections, with a yield or stop sign controlling a minor movement

approaching the circle, while traffic exiting or circling inside the circle is a free flow with no stopping.

4.4 Existing Traffic Conditions

Capacity and level of service analysis were conducted at 12 locations (four signalized and five unsignalized intersections and three roundabouts) during the selected weekday/weekend peak hours. Table 4-3 shows the v/c ratios, delays, and LOS for each peak hour at these locations. The analysis reveals that most intersections operate at an acceptable level of service (LOS A, B, and C) during the AM, midday and PM peak hours. However, some intersections in the study area operate at poorer level of service during the weekend late evening peak hours. The intersections of City Island Avenue/Cross Street (signalized intersection) and City Island Avenue/Bridge Street (unsignalized intersection) operated at a poor LOS D during the weekend late evening hours.

The capacity analysis (HCS) for two intersections of Pelham Parkway/Shore Road/City Island Road and City Island Avenue/Bridge Street showed overall an acceptable levels of Service (from B to lower D), but it was observed in the field that left turns at these two locations cause vehicular conflicts and long queues.

Table 4-3 (Page 1 of 4)
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		2			2			3		
		LT	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		5			3			6		
		LTR	3	28.40	C	2	28.40	C	4	28.40	C
			3			5			2		
	NB		3			1			1		
		LTR	215	6.20	A	367	7.30	A	385	7.50	A
			2			2			1		
	SB		2			4			5		
		LTR	145	5.70	A	378	7.30	A	594	9.90	A
			1			2			3		
City Island Avenue and Winter Street	EB		2			4			8		
		LR	2	28.20	C	0	28.20	C	4	28.50	C
	NB		5			6			2		
		LT	172	6.70	A	300	8.80	A	311	7.90	A
	SB		123	5.50	A	334	6.90	A	427	7.90	A
		TR	3			6			8		
City Island Road and Pelham Parkway/Shore Road	WB		170	10.50	B	506	12.30	B	510	12.30	B
		LR	23	10.00	A	65	0.10	A	43	10.30	B
	NB		211	10.70	B	188	10.60	B	310	11.30	B
		TR	151	0.10	A	360	0.40	A	411	0.50	A
	SB		18	10.10	B	66	11.20	B	194	17.90	B
		LT	215	10.70	B	236	10.80	B	197	10.60	B

Table 4-3 (Page 2 of 4)
Traffic Capacity (HCS) Analysis - Summary of Delays, V/C Ratios and LOS for Unsignalized Intersections
Existing Conditions (Summer)

Weekday Peak Hours

			AM			MD			PM		
Intersection	Approach	Lane Group	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
		R									
	EB	L	131			85			50		
		T		12.20	B		13.30	B		13.30	B
		R	128			339			351		
City Island Avenue and Bridge Street	NB	T	379			430			526		
		R	10			64			11		
	SB	L	20			42			133		
		T	218	8.20	A	468	8.60	A	700	9.20	A
	WB	L	9			12			27		
		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		

Table 4-3 (Page 3 of 4)
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													
		TR	448	18.50	B	812	33.10	C	501	19.20	B	968	40.50	D
			31			88			33			37		
	SB		14			18			8			13		
		LT	710	32.40	C	881	39.80	D	755	33.90	C	866	43.60	D
City Island Avenue and Fordham Street	EB		12			14			16			24		
		LTR	6	29.30	C	10	29.30	C	6	29.40	C	10	29.90	C
			10			5			10			5		
	WB		17			20			17			20		
		LTR	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		16			11			6			4		
		LR		28.70	C		28.60	C		28.40	C		28.30	C
			1			4			3			4		
	NB		10			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		253	10.90	B	801	14.80	B	316	11.20	B	1081	10.50	B
		LR												
			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

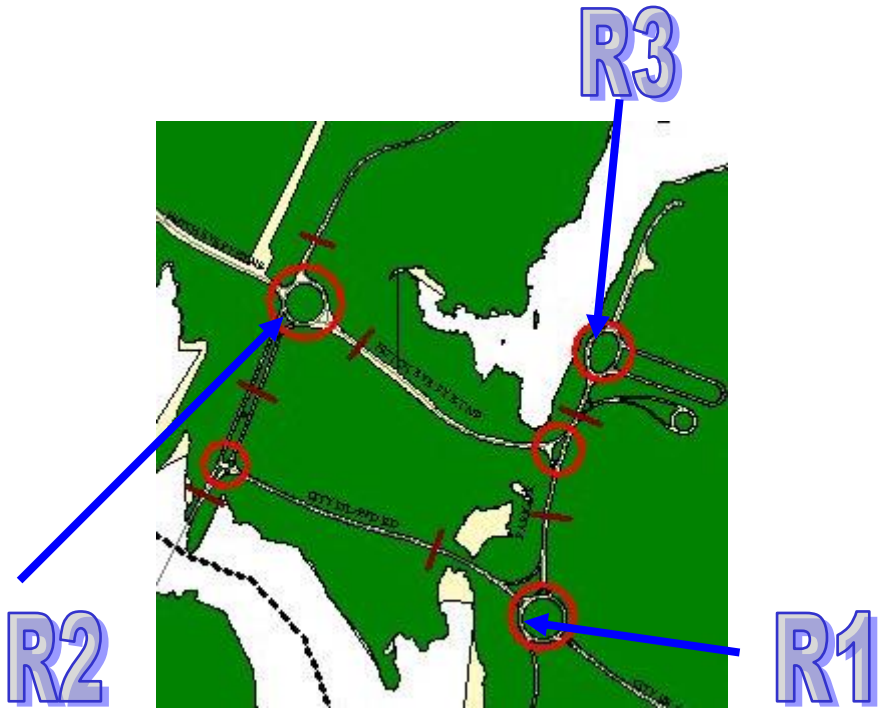
Table 4-3 (Page 4 of 4)
Traffic Capacity (HCS) Analysis - Summary of Delays, V/C Ratios and LOS for Unsignalized Intersections
Existing Conditions (Summer)

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
		R												
	EB	L	230			54			614			62		
		T		24.40	C		14.30	B		24.90	C		21.20	C
		R	449			198			231			233		
City Island Avenue and Bridge Street	NB	T	452			813			494			924		
		R	24			52			56			68		
	SB	L	63			131			70			154		
		T	711	8.60	A	884	10.70	B	772	8.90	A	814	11.90	B
	WB	L	13			15			31			11		
		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		

4.5 Analysis of Roundabouts

There are only a few multiple-lane roundabouts in New York City, three of which are located in Pelham Bay Park. All roundabouts consist of three moving lanes inside the circle and one or two moving lanes approaching the circle from local roadways. The following maps/pictures show the location of the three roundabouts within the study area.



Roundabout 1 (R1) has three major approaches: City Island Road from/to City Island and Pelham Parkway, Park Drive from/to Orchard Breach/Bartow Pell Circle, and one minor approach from/to the NYPD Shooting Range/parking lot area.



Traffic entering the roundabout from all four approaches is controlled by a "Yield" sign.

Roundabout 2 (R2), **Bartow Pell Circle** has four major approaches: Park Drive from/to City Island/Orchard Beach, ramps from/to Hutchinson Parkway, Shore Road from/to Pelham Parkway,
and North Shore Road from/to Westchester County.



Traffic entering Bartow Pell Circle from all four approaches is controlled by a "Stop" sign.

Roundabout 3 (R3) **Orchard Beach Circle,** has three major approaches: Park Drives from/to City Island Circle/Bartow Pell Circle, Drives from/to Orchard Beach, Drive from/to Orchard Beach Parking Lot.


Traffic entering the Orchard Beach circle is controlled by a "Yield" sign.

Experience with multiple-lane roundabouts in the United States as well as within the City is insufficient to support an adequate analysis procedure. Theoretically, by increasing the number of lanes on the approaches and on the circulating roadway, the capacity may be also increased but the effect is less than that of a full additional lane. In other words, doubling the number of lanes does not double the capacity. In addition, the performance of multiple-lane roundabouts is affected to greater extents by site geometrics and driver characteristics. It is widely recognized that each of the approach lanes is likely to have substantially different gap acceptance

characteristics. For the study area multiple-lane roundabouts, a comprehensive roundabout analysis model was developed. The interpolation of the results produced by these models can be questionable because their internal assumptions and parameters have not been well validated in the United States. The methodology used for analysis of multilane roundabouts presents the best utilization of the limited field data collected at the roundabouts. The operating parameters for the purpose of the analysis are modified.

In general, there are two models useful for roundabout analysis:

1. Empirical model of roundabout that includes a collection of the field data and development of relationships between geometric features and performance measures such as capacity and delay.
2. Analytical model that includes analysis of the gap acceptance theory.

Calibration of these two models for the roundabouts (either congested or uncongested) in the study area were analyzed.

SYDRA software was used to make an assessment of the empirical model for the roundabouts. The model included various parameters from the field data with relationships between geometric features and performance measures such as capacity, demand flow, $95^{\%}$ back of queue, travel time and distance, delay and LOS.

The capacity of the roundabout using gap acceptance techniques with the basic parameters of critical gap and follow-up time was also projected. It was assumed that the performance of each leg of a roundabout could be analyzed independently of the other legs. It was observed in the field that drivers who used a smaller radius when making a left turn usually traveled farther around the roundabout, traveled slower, and had longer intra-platoon headways (or lower saturation flow rate). The longer intra-platoon headway reduces the opportunities for drivers to enter the roundabout, and therefore, the capacity of roundabout can be reduced.

Since drivers usually make a right turn into/from the roundabout, the gap acceptance characteristics of drivers are expected to be the same as, or similar to, those of drivers making right turns at Two-Way Stop Control (TWSC) intersections. The analyzed roundabouts in the

study area with three inside moving lanes showed multi-traffic interactions that influence driver behavior. The conflicting flows are calculated by evaluating the 15-minute volumes of vehicles passing in front of the entering vehicles. Traffic exits the roundabout as free flow; therefore, the movement is neglected in the analysis. The roundabouts in the study area are also considered to facilitate U-turns, which are included in the balanced volumes.

The three roundabouts were analyzed using SYNCHRO and SYDRA. The analysis showed that each roundabout operates at an acceptable LOS during the various peak hours. Table 4-4 shows the capacity analysis for the roundabouts including their volumes, queuing distances and LOS. The longest queue (185 feet for the EB approach) was observed at the City Island Road circle (Roundabout 1) during the Saturday late PM peak hours. All other approaches had estimated queue lengths up to 100 feet. During the weekday peak hours (AM, midday and PM) queue lengths were slightly lower (up to 50 feet) than during weekend peak hours on all approaches for the three roundabouts. The Orchard Beach circle had very low queue lengths (from 6 to 22 feet, with LOS A for all approaches) because the main north-south approaches are principally free flows while the westbound approach has low volumes.

Table 4-4 (Page 1 of 2)
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

Table 4-4 (Page 2 of 2)
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

4.6 Queuing Analysis

Queues for vehicles entering and exiting the Island were observed during both the weekday and weekend evening peak hours. The longest queue extends from the first circle in the park and stretches along City Island Road/Avenue to Sea Shore Restaurant (Cross Street/City Island Avenue). Queuing is caused primarily by parking turnover activities (i.e., Sea Shore Restaurant's parking lot) and by left turn movements at the intersection of City Island Avenue/Bridge Street.

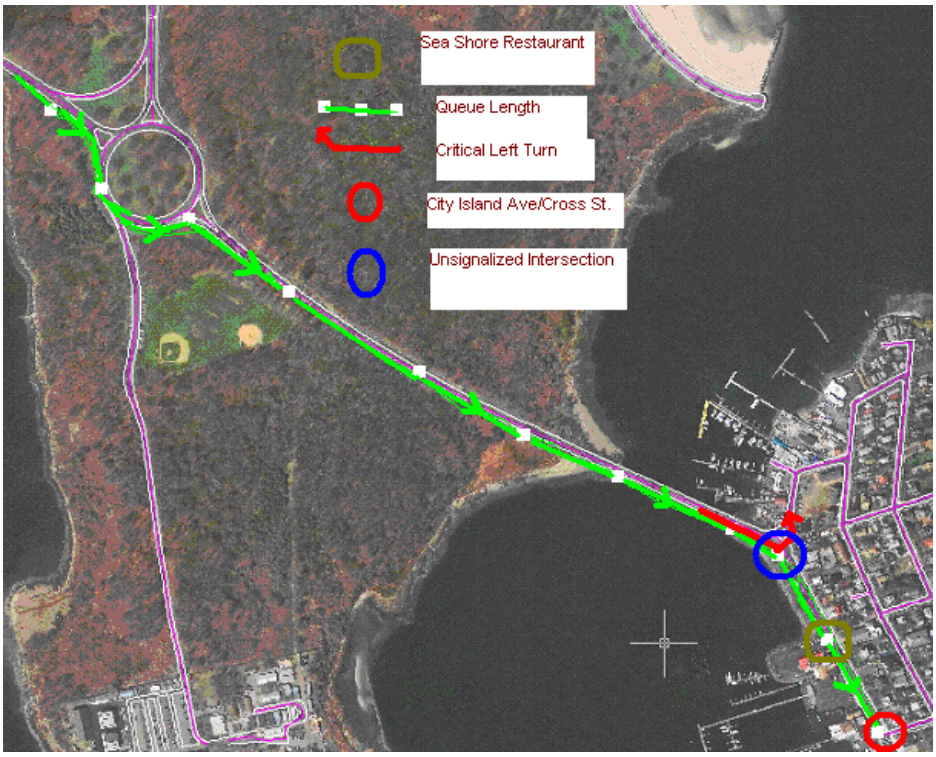
Queuing also occurs at the southern tip of City Island Avenue between Rochelle Street and Belden Point, during the various evening rush hours. Like the northern tip, queuing in this segment is caused primarily by the limitation of on- and off-street parking and a high in/out parking turnover rates from privately owned parking lots. Motorists often search for parking along City Island Avenue, if none is available at the restaurants.

On street parking is almost non-existent at the end of Island and only parking available is a few parking lots reserved for restaurants only.

Queuing for most critical sections in the study area, including the intersection of City Island Avenue/Cross Street (signalized) and the intersection of City Island Avenue/Bridge Street (unsignalized), is calculated by the applying the entire HCM methodology on a lane-by-lane basis. Theoretical studies and empirical observations have demonstrated that the probability distribution of queue lengths for any minor movement at a signalized/unsignalized intersection is a function of the capacity of the movement and the volume of traffic being served during the analyzed period. The 50^{th} and 95^{th} percentile queue lengths were calculated for major and minor movements at these two intersections during the 15-minute period.

The analysis showed that the queue for the 50^{th} and 95^{th} percentile of vehicles entering the Island at City Island Avenue was approximately 218 and 560 feet (9 or 22.4 vehicles). The queue was even longer at the City Island Avenue/Bridge Street intersection where left turn demand and heavy outbound traffic, which did not provide acceptance gaps caused the queue to extend for approximately ½ mile (2,640 feet or 106 vehicles in queue) from the first circle to Cross Street. There is minimal queuing for outbound traffic. Along City Island Avenue, between Rochelle Street and Belden Point, the queue was estimated (as well as observed) to be approximately 500 feet or 20 vehicles in queue in each direction.

The following picture shows the queuing along City Island Avenue/City Island Road (between the first roundabout in the park and Bridge Street on the Island) during the evening peak hours.



SYDRA models were used to determine the queue lengths at unsignalized intersections. The cycle-average queue length incorporates all queue states including zero queues. Low delay associated with a long back of queue between the City Island Road circle (roundabout 1) and Sea Shore Restaurant is a result of a high arrival (demand) flow rate, large green time ratio (relatively short red/block time at the intersection of Cross Street/City Island Avenue) and a low degree of saturation. For the three roundabouts in the study area, this occurs only under low circulating flow, rather than high entry demand flow conditions. In such cases, delay consists of acceleration and deceleration delays only and very small or zero stopped delays can be predicted. However, a large proportion of vehicles may be undelayed, and therefore the cycle average queue may be small in this case. Table 4-4 shows volumes, queuing distances and LOS for the three roundabouts analyzed.

The back queue (HCM Delay and Queue) was calculated for the signalized intersection of Cross Street/City Island Avenue using the HCM 2000 equation. For the unsignalized intersection of

Bridge Street/City Island Avenue, the HCM 2000 methodology gave a cycle-average queue rather than a back of queue. As a result, SYDRA gave a queue length according to the Queue Type Selected:

Model applicable when the "HCM Delay and Queue" Option is selected:

	Delay Model	Geometric Delay Components	Back of Queue Model	Cycle-Average Queue Model
Signals	HCM Model	SYDRA Standard	HCM Model	Based on HCM Standard
Roundabout*	SYDRA Standard	SYDRA Standard	SYDRA Standard	SYDRA Standard
Two-Way Stop Control (TWSC)	HCM Model	HCM Model (5 seconds)	SYDRA Standard	Based on HCM Delay Model
Give-Way (Yield) Control	HCM Model	HCM Model (5 seconds)	SYDRA Standard	Based on HCM Delay Model
All-Way Stop Control	SYDRA Standard	HCM Model (5 seconds)	SYDRA Standard	SYDRA Standard

* HCM does not provide delay and queue models for roundabouts.

SYDRA used gap-acceptance modeling for the analysis of minor (entry) movements at two-way stop (TWSC) and give-away (Yield) sign controlled intersections. The same modeling principles are applied to entry (approaching) streams at roundabouts and opposed (permitted turns) at signalized intersections. SYDRA gap acceptance models are used not only for capacity estimation, but also for the estimation of delay, queue length and other performance measures. The HCM approach to capacity modeling for roundabouts and TWSC is based on gap-acceptance method, which is consistent with the SYDRA method.

4.7 Vehicular Speeds

Vehicular travel times were collected in August 2003 during the AM, midday and PM peak hours for weekdays and Sunday midday and PM peak hours using the "floating car technique" in which the survey car seeks to travel at the speed of a typical car in the traffic stream by passing approximately, the same number of cars as passes it. A driver and data recorder were dispatched in a vehicle and traveled each of the assigned routes recording the start time and elapsed time to each checkpoint (intersection) and endpoint. Inspectors also recorded all other activities or occurrences such as illegal or double parking, accidents, police/fire department activities,

construction activity, etc. providing complete details regarding location, time, duration, company or agency name, and all other pertinent information.

Speed analysis and travel runs are important to evaluate the level of congestion along the main corridors in the study area. Several factors cause speed reduction including vehicular and pedestrian conflicts, traffic controls, loading/unloadings, illegal curbside parking and standing, etc. On City Island, there are numerous attractions (seafood restaurants, marinas, etc.), which contribute to a reduction of speed especially along City Island Avenue during the peak hours. Recreational activities (such as jogging, walking, biking, and horse riding) in the Pelham Bay Park and Orchard Beach areas also reduce speeds on Park Drives and other arterials in the park.

The following major corridors were selected for travel runs and analysis:

- City Island Avenue between City Island Bridge and Belden Point
- City Island Road between Shore Road/Pelham Parkway and City Island Bridge
- Pelham Parkway/North Shore Road, between Pelham Draw Bridge and Bronx/ Westchester County borderline.
- Park Drives between City Island Road and Orchard Beach Parking Lot, and between Bartow Pell Circle and Orchard Beach Triangle.

Exhibit 4-5 shows the speed run corridors and Table 4-5 shows the average travel speeds for the analyzed corridors.

Overall, City Island Road between Pelham Parkway/Shore Road and City Island Bridge had the lowest average travel speeds. The average speeds observed were 19.68, 13.42, 12.10, 12.65 and 10.89 mph for the southbound direction, while for the northbound direction, average speeds were 17.21, 21.27, 14.33, 9.73 and 11.65 mph during the weekday AM, midday and PM peak hours, and Sunday midday and PM peak hours, respectively.

Exhibit 4-5 Speed Run Corridors

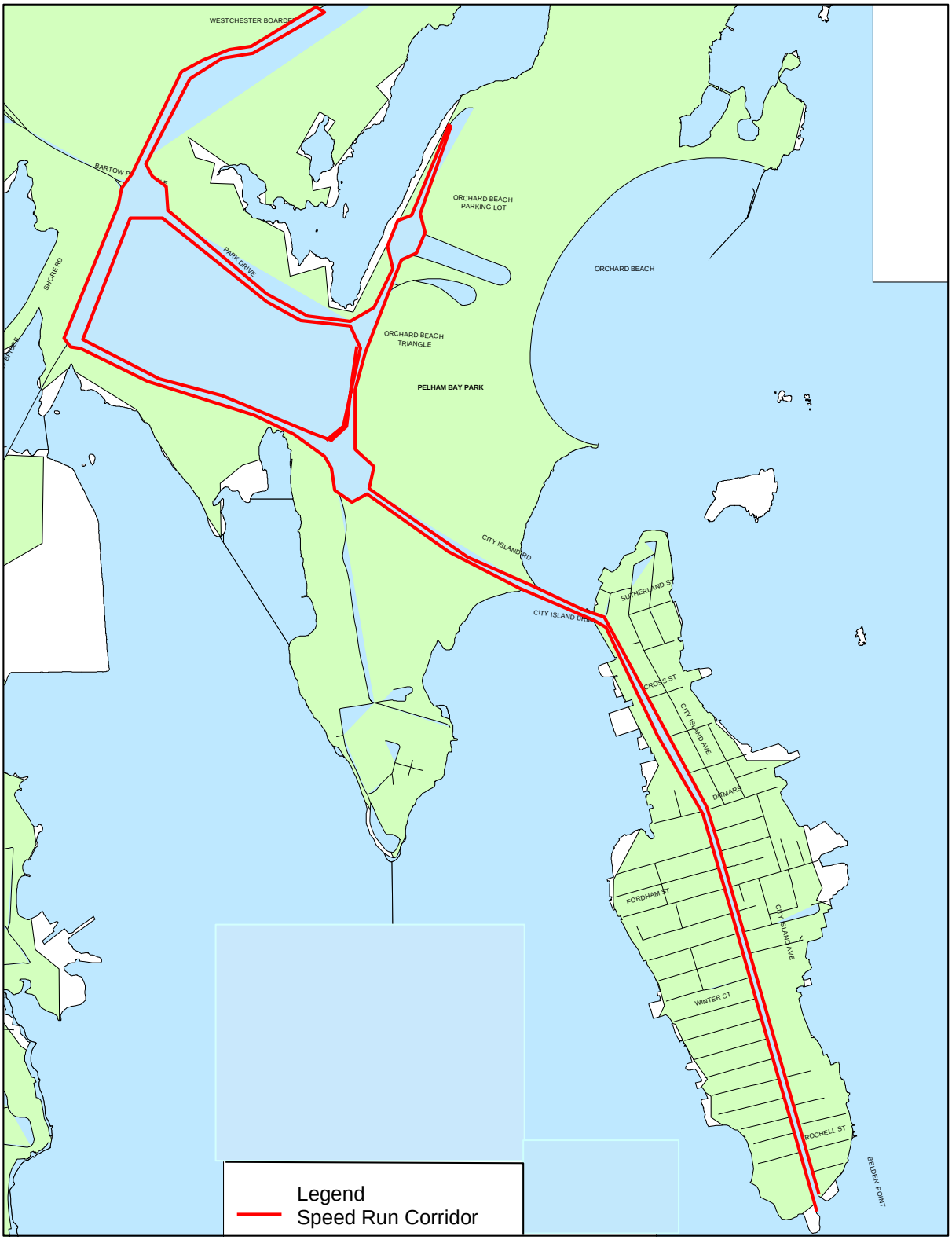


Table 4-5: Corridor Travel Speeds

No.	Corridor	Peak Hour	Direction	Existing Conditions 2003 Average Speed (mph)
1	Pelham Parkway between Pelham Draw Bridge and Bronx/Westchester Border	AM	EB	31.22
			WB	33.10
		MD	EB	32.03
			WB	33.08
		PM	EB	29.82
			WB	36.46
		SUN MD	EB	28.86
			WB	26.68
		SUN PM	EB	29.11
			WB	31.28
2	City Island Avenue between City Island Bridge and Belden Point	AM	SB	23.99
			NB	18.57
		MD	SB	20.53
			NB	19.66
		PM	SB	21.54
			NB	16.80
		SUN MD	SB	13.71
			NB	14.95
		SUN PM	SB	6.59
			NB	11.36
3	City Island Road between Pelham Parkway/Shore Road and City Island Bridge	AM	SB	19.68
			NB	17.21
		MD	SB	13.42
			NB	21.27
		PM	SB	12.10
			NB	14.33
		SUN MD	SB	12.65
			NB	9.73
		SUN PM	SB	10.89
			NB	11.65
4	Park Drive between City Island Road and Orchard Beach Parking Lot	AM	SB	20.27
			NB	24.84
		MD	SB	15.74
			NB	27.09
		PM	SB	23.11
			NB	26.11
		SUN MD	SB	22.98
			NB	26.07
		SUN PM	SB	25.64
			NB	24.94
5	Park Drive between Bartow Pell Circle and Orchard Beach Triangle	AM	NB	24.23
			SB	24.83
		MD	NB	26.32
			SB	26.28
		PM	SB	25.73
			NB	23.61
		SUN MD	SB	21.44
			NB	25.53
		SUN PM	SB	23.62
			NB	23.83

City Island Avenue between City Island Bridge and Belden Point recorded also lower travel speeds. The average speeds were 23.99, 20.53, 21.54, 13.71, 14.95, and 11.36 mph for the southbound direction, while for the northbound direction the average speeds were 18.57, 19.66, 16.80, 13.71, and 6.59 mph during the weekday AM, midday and PM, and Sunday midday and PM peak hours, respectively.

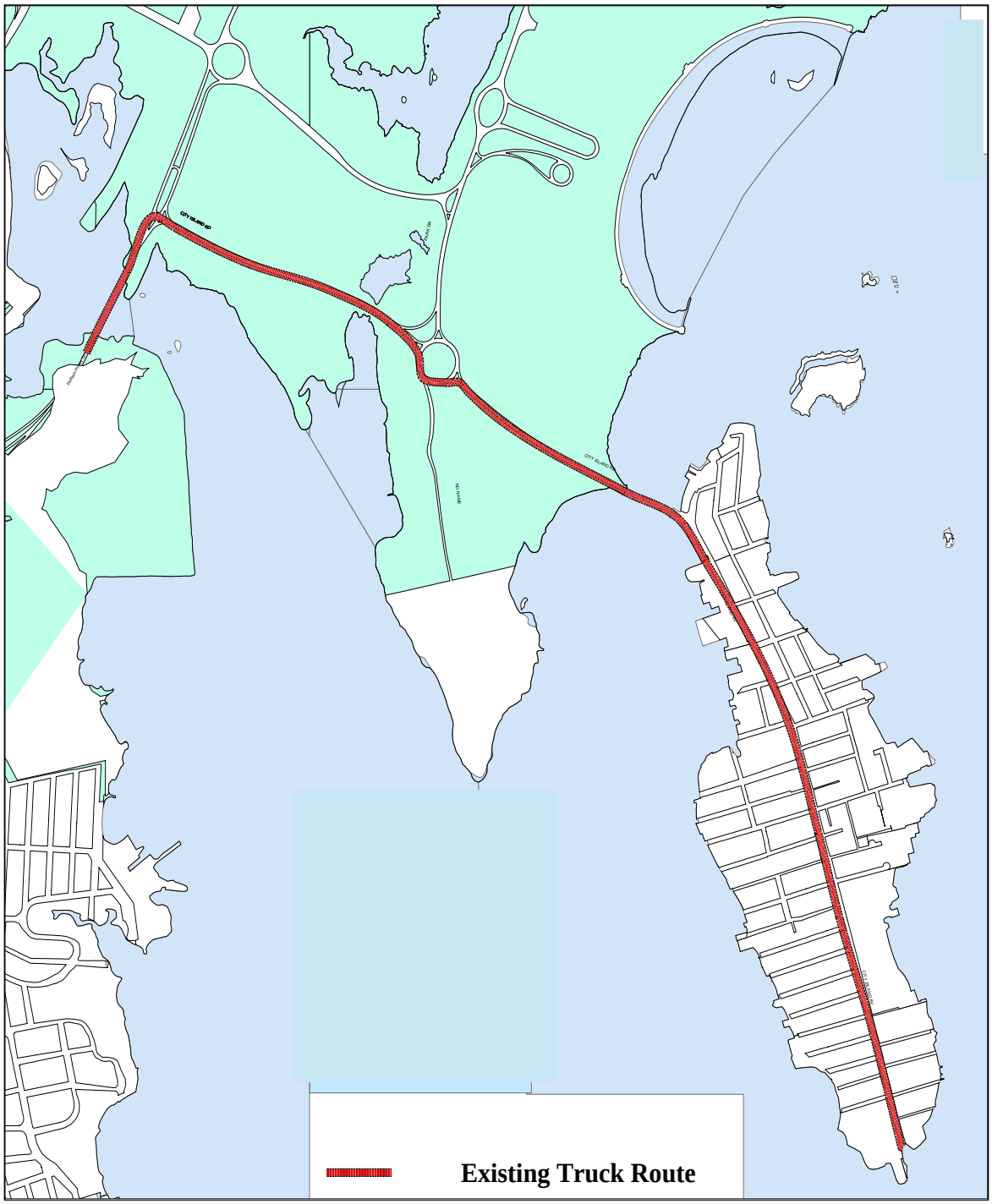
Pelham Parkway/North Shore Road between Pelham Draw Bridge and Bronx/Westchester borderline, recorded the highest average speeds in the study area for most of the peak hours. The average speeds for the northbound direction were 31.22, 32.03, 29.82, 28.86 and 29.11 mph, while 33.10, 33.08, 36.46, 26.68, and 31.28 mph for the southbound direction during the weekday's AM, midday, and PM peak hours, and Sunday midday and PM peak hours, respectively.

The average speeds on Park Drives between City Island Road, Bartow Pell Circle, and Orchard Beach parking lot were about 30 mph during the various peak hours.

4.8 Goods Movement

City Island Road/City Island Avenue is the only designated truck route in the study area used for local delivery by trucks on City Island to deliver goods to the various businesses. Most of these facilities are located along City Island Avenue and provide adequate layover for loading/unloading. Nevertheless, some illegal truck movements (double-parking using non-designated truck routes and illegally loading/unloading in bus stops) were observed. Double-parking on City Island Avenue causes trucks to block the effective moving lane while loading/unloading, which causes delay. Exhibit 4-6 shows the existing truck route in the study area.

Exhibit 4-6
Existing Truck Route



4.8 Future Traffic Conditions

The future traffic condition analyzed 12 locations (nine intersections and three roundabouts) in the study area for the weekday AM, midday, and PM peak hours, as well as the weekend (Saturday/Sunday) midday and PM peak hours.

To determine potential traffic impacts of the future conditions, the existing 2003 traffic volumes were projected to 2013 analysis year by adding a background traffic growth rate of 0.5 percent per year* and potential trips generated from planned developments by 2013.

The future plans on the island will include two new residential developments (i.e. 44 two-family homes), improvements to the marina, and replacement of the City Island Bridge. The Department of City Planning (DCP) has indicated that 22 two-family detached homes will be built on City Island Avenue between Cross and Beach Streets. The site is currently used as a boatyard and marina (The Royal Marina); the existing boat slips would be maintained. Fifty of the boat slips will be designated to the new development, while the remaining 70 will be leased to private users. In addition, there will be 107 accessory parking spaces, of which 68 spaces are planned for the development while remaining 39 spaces to the private boat slips. The following photos show the existing boatyard and marina as the site proposed for construction of two-family detached homes.

* The annul 0.5% traffic growth rate for the Borough of Bronx was specified in the CEQR Technical Manual.

The other developments will include construction of 22 spacious two-family homes on the southeast end of Fordham Street that once belonged to International Underwater Contractors. The following photos show the existing land uses in the vicinity of Fordham Street/Place proposed for the construction of two-large-family homes.

The number of vehicles and residents has a high correlation with average weekday vehicle trip ends. The use of these variables is limited, however, because the numbers of vehicles and residents was often difficult to obtain or predict.

According to the Trip Generation Report, 7th Edition, published by the Institute of Transportation Engineers (ITE), the land use category for the planned two-family detached homes is best approximated by the Residential Condominium/Townhouse (category 230) with the weekday AM and PM and Saturday/Sunday peak hour trip generation rates are 0.44, 0.52, 0.47 and 0.45 per dwelling unit, respectively. This land use category generated much lower trips than, for instance, the Single-Family Detached Housing (category 210) with the weekday AM and PM and Saturday/Sunday peak hour trip generation rates of 0.75, 1.01, 0.94 and 0.86 per dwelling unit, respectively. Although Single-Family Detached units had the highest trip generation rates per dwelling unit of all residential uses, the land use category 230 (Residential Condominium/Townhouse) trip rates were used and doubled in order to estimate new trips for the Two-Family Detached Housing developments.

For the existing marina facility, based on the ITE Trip Generation Report, the corresponding weekday AM and PM and Saturday/Sunday peak hour trip generation rates are 0.08, 0.19, 0.27 and 0.31 per berth.

As a result, comparisons of the relative trip generations from the proposed Two-Family Housing and the existing marina facility at the development site during the weekday AM, PM, and Saturday/Sunday peak hours are provided in Table 4-6. The table includes total numbers of trips estimated from both developments (combined 88 dwelling units) as well as total trips reduced by current trips from marina and boatyard.

Table 4-6
Estimated Trips from Future Residential Developments

Weekday	Proposed 44 Two-Family Homes (88 dwelling units) (Vehicles)	Marina (120 berths) (Vehicles)	Total Estimated Trips	Distribution (No. of vehicles) (Going in/out) (Percentage)
AM Peak	0.88*88 =66	0.08*120 =10	56	(25/75)
PM Peak	1.04*88 =92	0.19*120 =23	69	(63/37)
Saturday Peak	0.94*88 =83	0.27*120 =32	51	(54/46)
Sunday Peak	0.90*88 =79	0.31*120 =37	42	(53/47)

The relative trip generations between the proposed two-family residential development and the existing marina facility during weekday AM, PM and Saturday and Sunday peak hours would generate net of 23, 23, 10, and 3 additional trips to the site. Estimated trips from the other two-family residential development (Fordham Street) would generate 33, 46, 42, and 40 new trips during the weekday AM, PM and Saturday and Sunday peak hours, respectively. Total number of estimated trips from both developments would be 56, 69, 51, and 42 trips during the weekday AM, PM and Saturday and Sunday peak hours, respectively These projected trips for both residential developments (44 two-family houses) are loaded onto the future network volumes (2013) with an annual background traffic growth rate of 0.5%.

The proposed bridge replacement will not generate any additional trips to the island. The bridge will not greatly alter roadway geometry even though the existing roadway width on the bridge

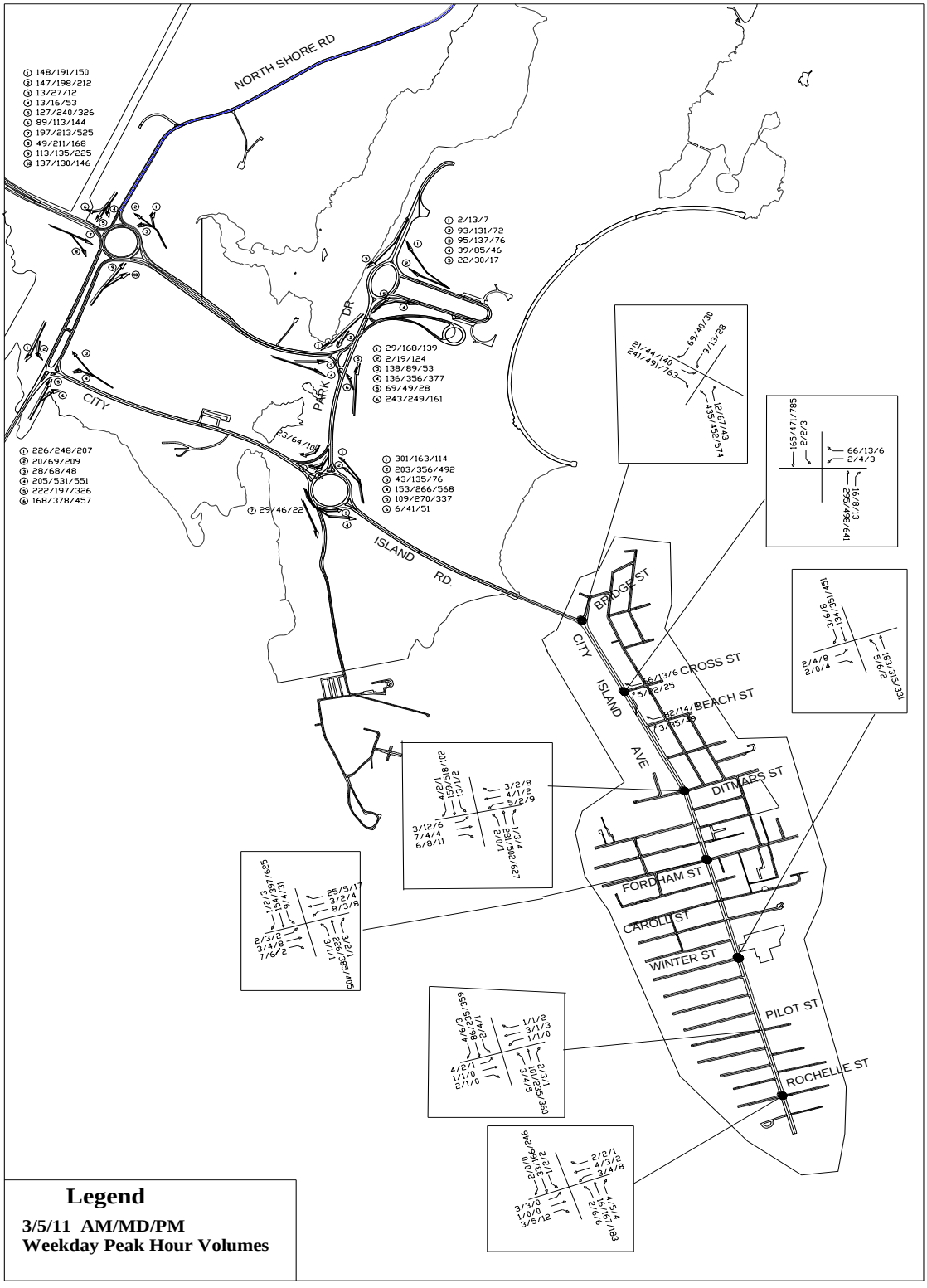
will be widened (approximately 20 feet wider than the existing facility) and will provide improved safety features such as standard lane widths, bike and pedestrian paths and will facilitate rehabilitation needs with minimum lane closure. It will feature enhanced public amenities with a 5 feet wide sidewalk on the north side and 12 feet wide sidewalk/bikeway on the south side. The number of moving lanes will be maintained to provide one moving lane in each direction separated by a median 'Fire Lane'.

Exhibits 4-7 through 4-9 show the future 2013 weekday AM, midday and PM peak hour volumes as well as the weekend (midday and PM) peak hour volumes.

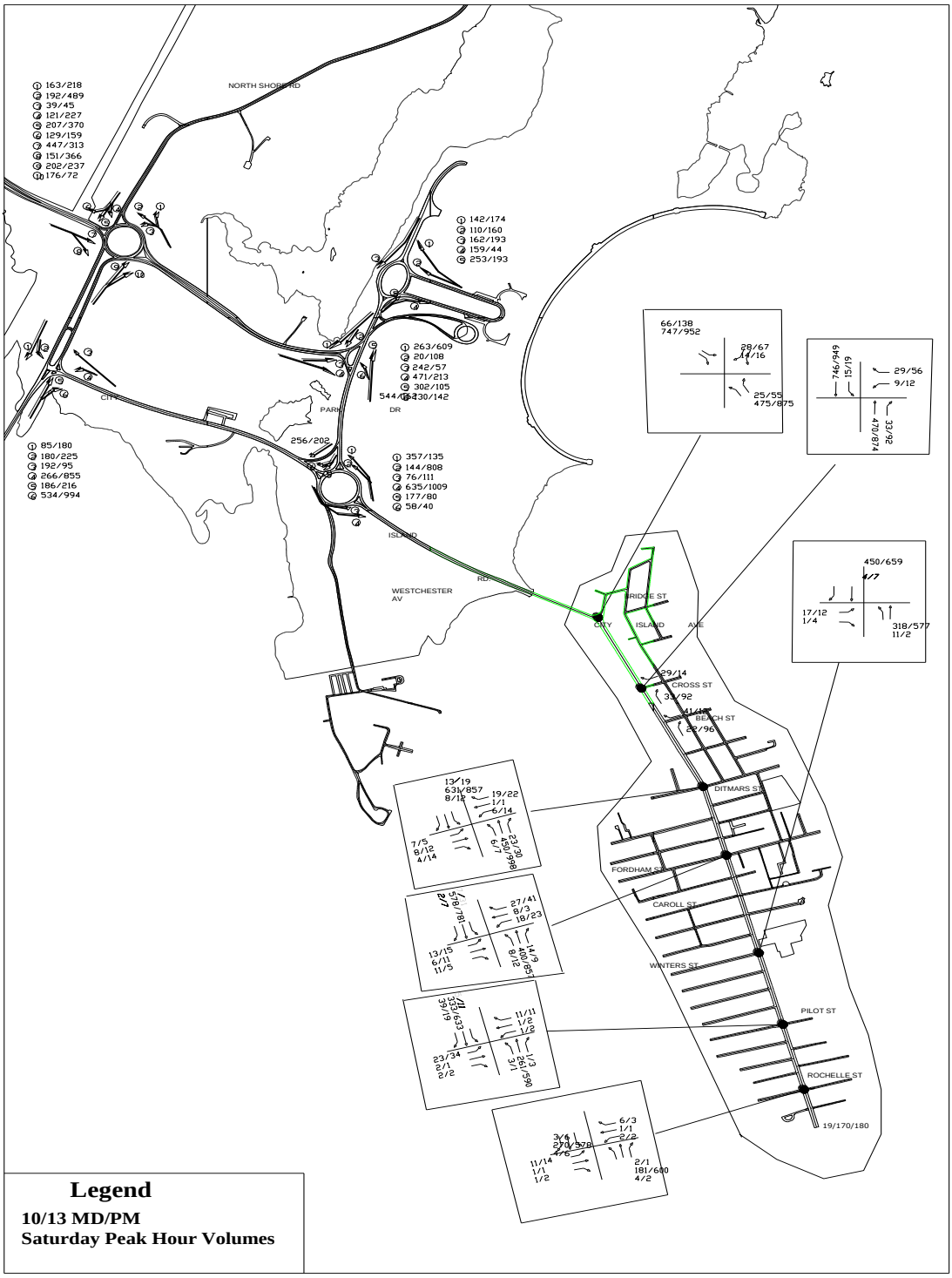
Results of analysis for the projected 2013 traffic conditions indicates that most intersections would continue to operate under acceptable LOS "C" or better during the weekday AM, midday, PM and Saturday/Sunday peak hours. However, two intersections would continue to operate at LOS D during the weekend PM peak hours. These locations are Cross Street/City Island Avenue and Bridge Street/City Island Avenue.

Table 4-7 shows the results of capacity analysis (including LOS, delays and V/C ratios) for the nine intersections (four signalized and five unsignalized) analyzed in the study area. Table 4-8 shows results of the capacity analysis for the three analyzed roundabouts in Pelham Bay Park – they would all have a satisfactory LOS.

Exhibits 4-7
Future Traffic Volumes
Weekday Peak Hours (AM, MD and PM)



Exhibits 4-8
Future Traffic Volumes
Saturday Peak Hours (MD and PM)



Exhibits 4-9
Future Traffic Volumes
Sunday Peak Hours (MD and PM)

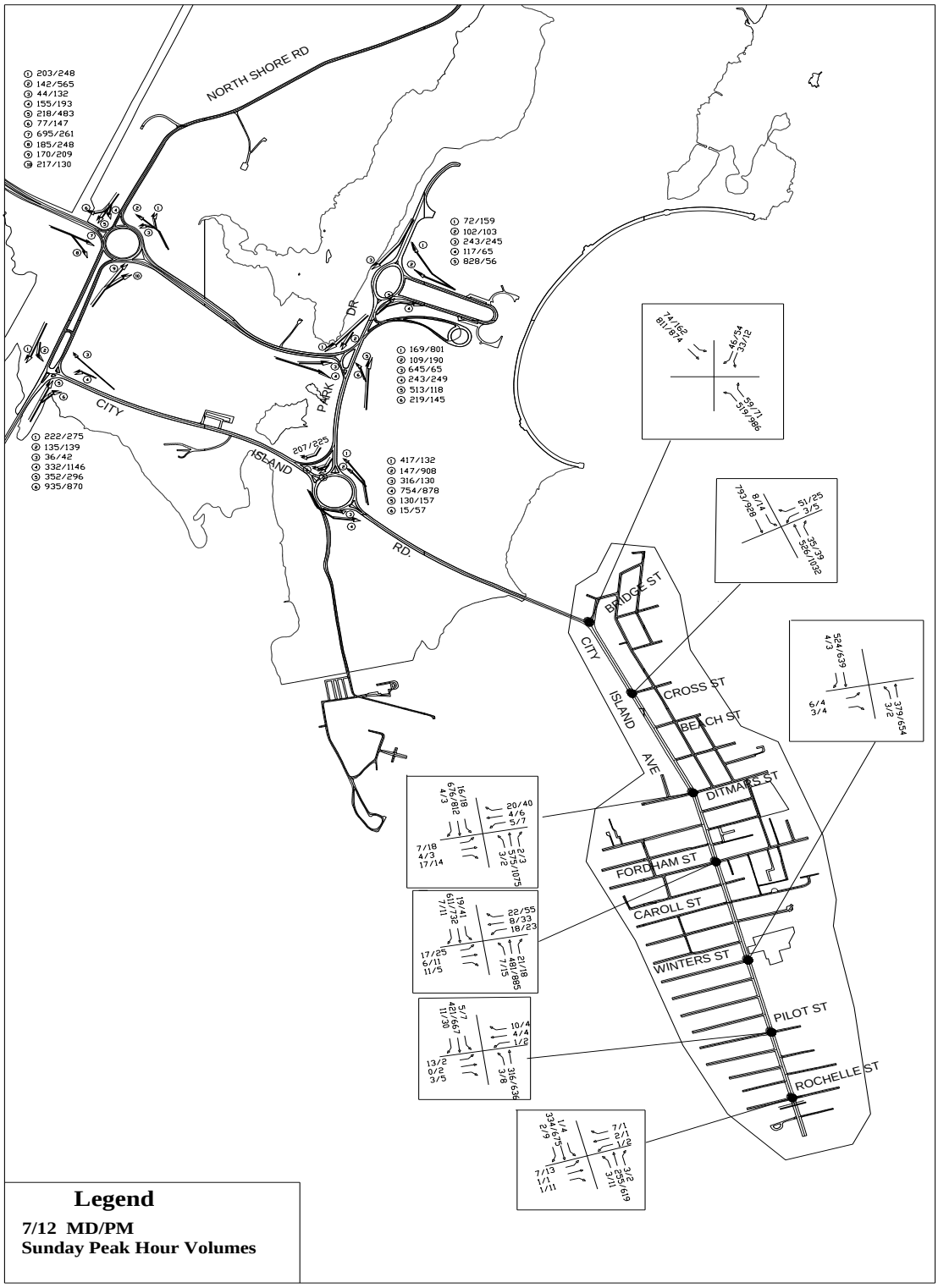


Table 4-7 (Page 1 of 4)
Traffic Capacity Analysis - Summary of Delays, V/C Ratios and LOS
Future Conditions (Signalized Intersections)

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		2			2			3		
		LT	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		2			3			2		
		LTR	3	28.50	C	4	28.70	C	8	28.50	C
			7			6			2		
	WB		8			3			8		
		LTR	3	29.40	C	2	28.40	C	4	29.10	C
			25			5			17		
	NB		3			1			1		
		LTR	227	6.20	A	385	7.50	A	405	7.70	A
			3			2			1		
	SB		2			4			31		
		LTR	154	5.80	A	397	7.60	A	625	11.50	B
			1			2			3		
City Island Avenue and Winter Street	EB		2			4			8		
		LR		28.20	C		28.30	C		28.50	C
			2			0			4		
	NB		5			6			2		
		LT	183	6.80	A	315	8.90	A	331	8.20	A
	SB		134	5.60	A	351	7.00	A	451	8.10	A
		TR	3			6			8		
City Island Road and Pelham Parkway/Shore Road	WB		205	10.60	B	531	12.50	B	551	12.60	B
		LR	28	10.10	B	68	0.10	A	48	10.30	B
	NB		222	10.80	B	197	10.70	B	326	11.40	B
		TR	168	0.10	A	378	0.50	A	457	0.50	A
	SB		20	10.20	B	69	11.30	B	209	19.60	B
		LT	226	10.80	B	248	10.90	B	207	10.70	B

Table 4-7 (Page 2 of 4)
Traffic Capacity (HCS) Analysis - Summary of Delays, V/C Ratios and LOS
Future Conditions (Unsignalized Intersections)

Weekday Peak Hours

			AM			MD			PM		
Intersection	Approach	Lane Group	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
		R									
	EB	L	138			89			53		
		T		12.70	B		13.90	B		14.20	B
		R	134			356			377		
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
		R	69			40			30		
City Island Avenue and Pilot Street	NB	L	3			4			5		
		T	101	7.40	A	235	7.90	A	281	8.10	A
		R	2			3			1		
	SB	L	2			4			1		
		T	86	7.40	A	238	7.80	A	359	8.00	A
		R	4			4			3		
	WB	L	1			1			0		
		T	3	9.50	A	1	10.40	B	3	15.10	B
		R	1			1			2		
	EB	L	4			2			1		
		T	1	9.30	A	1	10.40	B	0	11.40	B
		R	2			1			0		
City Island Avenue and Rochelle Street	NB	L	2			6			6		
		T	16	7.30	A	167	7.70	A	183	7.90	A
		R	4			5			4		
	SB	L	1			2			2		
		T	33	7.30	A	166	7.70	A	246	7.70	A
		R	2			0			0		
	WB	L	3			4			8		
		T	4	9.00	A	3	10.00	A	2	10.60	B
		R	2			2			1		
	EB	L	3			3			0		
		T	1	8.80	A	0	9.50	A	0	10.00	A
		R	3			5			12		

Table 4-7 (Page 3 of 4)
Traffic Capacity Analysis - Summary of Delays, V/C Ratios and LOS
Future Conditions (Signalized Intersections)

			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			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		15			19			8			14		
		LT	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
	SB		450	7.90	A	659	11.00	B	524	8.90	A	639	10.50	B
		TR	4			7			4			3		
City Island Road and Pelham Parkway/Shore Road	WB		266	11.00	B	855	15.40	B	1135	11.50	B	1146	14.30	B
		LR												
			192			95			40	10.40	B	42		
	NB	TR	186	10.70	B	216	10.80	B	352	12.20	B	296	11.20	B
			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

Table 4-7 (Page 4 of 4)
Traffic Capacity (HCS) Analysis - Summary of Delays, V/C Ratios and LOS
Future Conditions (Unsignalized Intersections)

			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	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
		R												
	EB	L	242			57			645			65		
		T		24.60	C		15.20	B		25.20	C		24.10	C
		R	471			213			243			249		
City Island Avenue and Bridge Street	NB	T	475			875			519			986		
		R	25			55			59			71		
	SB	L	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
		R	28			67			46			54		
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
		R	1			3			0			0		
	SB	L	5			11			5			7		
		T	333	7.90	A	633	8.70	A	421	8.10	A	667	8.80	A
		R	39			19			12			25.2		
	WB	L	1			2			1			2		
		T	1	10.00	A	2	13.30	B	4	10.80	B	4	14.60	B
		R	11			11			10			4		
	EB	L	23			34			13			2		
		T	2	11.40	B	1	16.20	B	0	11.70	B	2	14.40	B
		R	2			2			3			5		
City Island Avenue and Rochelle Street	NB	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		
	SB	L	4			6			1			4		
		T	270	7.80	A	578	8.90	A	334	7.90	A	675	8.90	A
		R	3			6			2			9		
	WB	L	2			2			1			2		
		T	1	9.80	A	1	14.00	B	2	10.30	B	1	15.30	B
		R	6			3			7			1		
	EB	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			1			11		

Table 4-8 (Page 1 of 2)
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

Table 4-8 (Page 2 of 2)
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

Travel Speed

The future delays and travel speed along the major corridors within the study area were calculated for the weekday AM, midday, and PM and weekend peak hours. The level of service and future delays were used to project future speeds. Future speed analysis is necessary to project the level of congestion along the main corridors in the study area. Several factors may continue to cause speed reduction including potential vehicular and pedestrian conflicts, traffic controls, loading/unloading activity, queuing, and restaurant and parking activities (ins and outs), illegal curbside parking and standing, etc. Recreational activities (such as jogging, walking, biking, and horse riding) in the future within the Pelham Bay Park and Orchard Beach areas are not expected to cause any major reduction of speed on Park Drives under the future condition scenario. The estimated number of vehicular trips from the proposed developments on the island plus a base growth rate of 0.5 percent per year would be small; therefore, the future travel speed will principally remain the same or slightly worsen along major corridors analyzed in the study area.

5.0 PEDESTRIAN AND BICYCLE ANALYSES

The City Island residential land use tends to have a dispersing effect on pedestrian trip ends while other land uses such as recreational (parks), commercial/retail (restaurants, marinas/yacht clubs), and transportation related uses have a tendency to concentrate pedestrian activity. Consistent with these land uses and their pedestrian activity, most pedestrian movements are concentrated along City Island Avenue, the only commercial strip on the island, and its major cross streets (Bridge, Cross, Fordham, Ditmars, Bay, Centre, Winters, Pilot, and Rochelle Streets). The highest pedestrian volumes are observed at bus stops, small stores/shopping areas as well as near major restaurants. Fewer pedestrian activities are observed near marinas, yacht clubs, and parking lots. In general, pedestrian activities on the island are sporadic, and volumes very low compared to the other parts of the borough or City. Pedestrian activity in Pelham Park is also very sporadic with a few joggers and rollerblades; pre-seasonal volumes are also significantly lower than seasonal volumes, therefore only higher seasonal volumes are included in the pedestrian analysis.

In addition to pedestrian traffic, a significant number of bikers navigate throughout the park using designated bike routes/lanes. On the other hand, only a few cyclists are observed on City Island. These trips are based on from home to the nearest destination such as grocery store, marina, school or playground.

Orchard Beach attracts thousands of recreational users during the summer months. It is partially isolated from the park and City Island and can be accessed only via two park drives (City Island Road and Shore Road). Most visitors to the beach arrive by autos, taxis, for-hire vehicles, and including two seasonal buses (during the summer months only).

5.1 Existing Condition

Pedestrian counts were conducted during the AM (8:00-9:00), midday (1:00-2:00 PM), and PM (5:00-6:00) weekday peak hours and Saturday and Sunday midday and PM peak hours (1:00-2:00 PM and 6:00-7:00 PM). Data were collected concurrently with vehicular traffic volumes during the peak hours at 13 intersections during the seasonal period only. The weekend midday and PM peak hours were analyzed because it was expected that volumes would be significantly higher than the weekday peak hours due to weekend recreational activities on the island and in

the park. The pedestrian analysis indicated that pedestrian movements and activities in the study area are not critical. The following 13 intersections including three roundabouts are analyzed:

1. City Island Avenue & Rochelle Street
2. City Island Avenue & Pilot Street
3. City Island Avenue & Winters Street
4. City Island Avenue & Centre Street
5. City Island Avenue & Carroll Street
6. City Island Avenue & Fordham Street
7. City Island Avenue & Ditmars Street
8. City Island Avenue & Cross Street
9. City Island Avenue & Bridge Street
10. City Island Road & Shore Road
11. City Island Road & Park Drive (Roundabout 1)
12. Park Drive & Orchard Beach Drive (Roundabout 2)
13. Park Drive/Hutchinson River Parkway & Shore Road (Roundabout 3)

5.2 Pedestrian Volumes

Table 5-1 provides a summary of the existing pedestrian volumes for the selected intersections and roundabouts during the selected peak hours. Based on the data collected, the following intersections have the highest pedestrian volumes during the weekday AM, midday, and PM peak hours and the Saturday and Sunday midday and PM peak hours:

1. City Island Avenue & Rochelle Street;
2. City Island Avenue & Fordham Street;
3. City Island Avenue & Carroll Street;
4. City Island Avenue & Winters Street;
5. City Island Avenue & Centre Street;
6. City Island Avenue & Cross Street;
7. City Island Avenue & Pilot Street; and
8. City Island Avenue & Bridge Street.

Table 5-1 (page 1 of 2)

Existing Pedestrian Volumes - Seasonal (Summer) Counts

		Weekdays			Saturday		Sunday	
Code	**Intersection Name**	**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

Table 5-1 (page 2 of 2)

Existing Pedestrian Volumes – Pre-Seasonal (Summer) Counts

		Weekdays			Saturday		Sunday	
Code	**Intersection Name**	**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

The heaviest pedestrian volumes were recorded at the intersection of City Island Avenue and Rochelle Street (in the proximity of four famous sea-food restaurants at Belden Point) where volumes were 22, 87, and 122 for the weekdays AM, midday, and PM peak hours; 92 and 182 for Saturday and 108 and 174 for Sunday midday and PM peak hours, respectively. The intersection of City Island Avenue and Fordham Street recorded the second highest volumes with 71, 113, and 54 for the weekdays AM, midday, and PM peak hours (in proximity of bus stops, gas station and supermarket); 124 and 139 for Saturday, and 104 and 163 for Sunday midday and PM peak hours, respectively. The morning peak hours for Saturday and Sunday were not included in the analysis because volumes were significantly lower than weekday peak hours. The heaviest pedestrian movements were observed near restaurants (and their parking lots) and bus stops. Pedestrian volumes are usually higher on Friday and Saturday for lunch and dinner. During the pre-season, most pedestrian activities are concentrated near the elementary school and shopping areas in addition to restaurants and marinas.

5.3 Pedestrian Analysis

The pedestrian analysis focuses on the capacity of crosswalks and corners, square footage per pedestrian (with or without vehicles), maximum per surge, and the level of service (LOS). Since pedestrian volumes are considerably low (only two locations with 100 or more pedestrians on all approaches) and most intersections are unsignalized, a detailed analysis is not required. Field observation shows a satisfactory pedestrian level of service at all locations. Accident statistics for the island showed that only a few cases were reported with pedestrian casualties for the entire study area. It was also observed that many of the existing sidewalks along City Island Avenue need repair or are not continuous from block to block; therefore, sidewalk repair or resurfacing is urgently needed.

5.4 Future Pedestrian Analysis

Pedestrian volumes in the study area are not expected to increase significantly by 2013. These smaller increases can be attributed to the future land use changes - new residential (i.e. construction of 44 two-family homes) and commercial developments, and restaurant and marina improvements. The highest pedestrian volumes in the study area will continue to be near commercial establishments, restaurants, marina and yacht clubs, school and playgrounds, as well as residential areas.

The future pedestrian volumes were generated using the existing pedestrian volumes and adding a 0.5% per year growth factor as well as new person trips generated by planned new residential developments that would generate 264 additional person trips to the area. Table 5-2 shows the future intersection volumes for crosswalks at the 13 analyzed locations. Like the existing conditions, all intersections analyzed for the future conditions are expected to operate at an acceptable level of service.

Table 5-2

Projected Pedestrian Volumes

		Weekdays			Saturday		Sunday	
Code	**Intersection Name**	**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	23	91	128	97	191	113	183
2	City Island Avenue & Pilot Street	21	47	55	21	84	19	49
3	City Island Avenue & Winters Street	13	57	46	26	63	34	69
4	City Island Avenue & Centre Street	24	23	59	43	76	32	80
5	City Island Avenue & Carroll Street	30	50	65	37	89	48	78
6	City Island Avenue & Fordham Street	78	124	59	136	153	114	179
7	City Island Avenue & Ditmars Street	22	29	51	33	62	36	53
8	City Island Avenue & Cross Street	13	17	24	46	74	45	85
9	City Island Avenue & Bridge Street	25	63	50	86	101	74	90
10	City Island Rd & Shore Rds	6	13	8	15	7	12	16
11	City Island Road & Park Drives Circle (RB 1)	3	9	5	13	9	11	16
12	Bartow Pell Circle (RB 2)	2	5	3	7	6	9	5
13	Orchard Beach Circle (RB 3)	3	9	15	12	35	26	36

5.5 Bicycle Analysis

The use of bicycles as an alternative mode of transportation (primarily for recreational use instead of commuting purposes) is evident in the study area. High volumes of bicycle traffic can be observed in the park, especially during the summer months, as well as on City Island. There are a few designated bicycle routes throughout the study area (in Pelham Bay Park) and there are no on-street routes on City Island. These designated bike routes connects the study area to the Bronx via Pelham Parkway Bridge; an un-designated route also connects City Island to and Orchard Beach via City Island Bridge. Numerous bicycles were observed in the vicinity of Orchard Beach and major recreational facilities in the park (golf clubs, horse stable, and playground) while a small number of bicycle uses were observed on City Island. Exhibit 5-1 shows the existing and recommended bike routes in the study area. The existing bicycle lanes run adjacent to the park drives (City Island Road and Park Drives) and rarely intersect with vehicular traffic.

Future Bicycling

The Departments of City Planning and Transportation recommended the creation of new bike lanes and the extension of existing bike lanes throughout the park and on City Island as part of the Bicycle Master Plan. The proposed rehabilitation of the City Island Bridge, being spearheaded by NYC DOT, Department of Bridges, includes a component to expand the marked on-street bike lanes in the study area. The new bridge will include new bike lanes to connect City Island to the rest of the Park. Future plans call for enhancement of the pedestrian and bicycling activities via the bridge by featuring a 1.5 meter-wide walkway on the north side and a 3.6 meter-wide walkway/bikeway on the south side. Installment of bike lanes (Class I) are proposal to connect the Orchard Beach to North Shore Roads/Westchester through Roundabout 2. The Bicycle Master Plan also recommended shared bike lanes along City Island Avenue, starting from City Island Bridge to Belden Point.

Exhibit 5-1

Existing and Proposed Bike Routes in the Study Area

6.0 ACCIDENT AND SAFETY ANALYSES

In order to improve safety on the street network, it is critical that an analysis of accident trends be conducted to identify locations with a significant number of accidents, to determine causal relationships, and to develop measures to address the problem. Consequently, a detailed analysis of all issues related to accidents in the study area, such as frequency, location, types, and causes of accidents is necessary. The accident analysis was conducted using NYSDOT and NYCDOT data. Table 6-1 shows the accident summary for the four-year period (1998-2001) for the study area.

The accident analysis focuses on the 15 intersections and three roundabouts in the study area being analyzed for traffic impacts. These locations had a total of 74, 40, 67, and 49 accidents in 1998, 1999, 2000 and 2001, respectively. Tables 6-2, 6-3, 6-4, and 6-5 show the accident summary by year, location, type, and cause. Of the 18 locations analyzed Shore Road and City Island Road had a highest number of accidents (an average of 15 accidents per year).

Five other locations had between 5 and 8 accidents - City Island Avenue/Fordham Street, City Island Avenue/City Island Road (8 accidents each), City Island Avenue and Ditmars, Cross, and Bridge Streets (5 accidents each), while all other locations in the study area had less than five accidents for the four years analyzed. The analysis showed that frequency of accidents in the study area was less than an average location in the other parts of the city.

Between 1998 and 2001 there were four, two and zero accidents for each year involving pedestrians, respectively. Most of these accidents occurred on City Island (along City Island Avenue at Fordham, Ditmars, Bowne and Centre Streets). There were also a small number of accidents (3) involving bicyclists for each of the years analyzed. These accidents occurred at the intersections of City Island Avenue and Bowne/Reville Streets and Shore Road/City Island Road.

There were no accidents with fatalities (involving vehicular, pedestrian or bicycle traffic) for the four years analyzed. There are various remedies proposed in this report to improve safety and circulation of vehicular and pedestrian/bicycle traffic at these critical locations.

TABLE 6-1

Four-Year Accident History (1998-2001)

Location	1998	1999	2000	2001	Total	Average
City Island Avenue & Rochelle Street	2	3	1	1	7	2
City Island Avenue & Horton Street	3	0	1	0	4	1
City Island Avenue & Reynold Street	0	0	3	1	4	1
City Island Avenue & Winters Street	2	3	3	4	12	4
City Island Avenue & Centre Street	2	0	3	2	7	2
City Island Avenue & Schofield Street	1	1	6	1	9	3
City Island Avenue & Carroll Street	1	0	2	1	4	1
City Island Avenue & Fordham Street	16	2	2	3	23	8
City Island Avenue & Bay Street	0	0	2	1	3	1
City Island Avenue & Reville Street	2	2	0	1	5	2
City Island Avenue & Ditmars Street	3	3	5	5	16	5
City Island Avenue & Bowne Street	2	2	2	1	7	2
City Island Avenue & Beach Street	2	3	0	2	7	2
City Island Avenue & Cross Street	6	1	2	6	15	5
City Island Avenue & Bridge Street	2	5	4	5	16	5
City Island Avenue & City Island Road (Bridge)	7	7	5	4	23	8
City Island Road & City Island Rd TU (Circle)	2	0	3	0	5	2
City Island Road & Shore Road/Pelham Parkway	21	6	20	10	57	15
Park Drive & City Island Road	0	2	3	1	4	1
TOTAL	**74**	**40**	**67**	**49**	**230**	**77**

Source: New York State Department of Transportation

TABLE 6-2

Summary of Traffic Accidents - 1998

Node #	Intersection Name	Total Accidents	Reported	Non-Reported	Fatal	Injury	Pedestrian	Bicyclist	Fixed Object	Wet Road	Night Accidents	Left Turn	Rear End	Overtaking	Right Angle	Right Turn	Head On	Sideswipe	Other
5867	City Island Avenue & Rochelle Street	2	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5869	City Island Avenue & Horton Street	3	1	2	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0
5874	City Island Avenue & Reynold Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5877	City Island Avenue & Winters Street	2	0	0	0	10	0	0	0	0	0	0	2	0	0	0	0	0	1
5878	City Island Avenue & Centre Street	2	2	0	0	2	1	0	0	0	0	0	0	1	0	0	0	0	1
5879	City Island Avenue & Schofield Street	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
5880	City Island Avenue & Carroll Street	1	1	0	0	2	0	0	0	0	0	0	0	0	1	0	0	0	0
5882	City Island Avenue & Fordham Street	16	8	8	0	5	2	0	0	0	0	0	2	1	2	0	0	0	3
5883	City Island Avenue & Bay Street	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
5886	City Island Avenue & Reville Street	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5887	City Island Avenue & Ditmars Street	3	1	2	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0
5888	City Island Avenue & Bowne Street	2	1	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0
5889	City Island Avenue & Beach Street	2	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
5890	City Island Avenue & Cross Street	6	2	4	0	7	0	0	0	0	0	0	2	0	0	0	0	0	0
5891	City Island Avenue & Bridge Street	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5881	City Island Avenue & City Island Road	7	4	3	0	6	1	0	0	0	0	0	2	0	0	0	0	0	2
5348	City Island Road & City Island Rd TU	2	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1
5336	City Island Road & Shore Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5347	City Island Road & Shore Road	21	11	10	0	20	0	1	0	0	0	1	3	0	0	1	0	0	6
5353	Park Drive & City Island Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5349	Park Drive & City Island Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	**74**	**35**	**37**	**0**	**58**	**4**	**1**	**0**	**0**	**0**	**4**	**13**	**2**	**4**	**1**	**0**	**0**	**15**

TABLE 6-3

Summary of Traffic Accidents - 1999

Node #	Intersection Name	Total Accidents	Reported	Non-Reported	Fatal	Injury	Pedestrian	Bicyclist	Fixed Object	Wet Road	Night Accidents	Left Turn	Rear End	Overtaking	Right Angle	Right Turn	Head On	Sideswipe	Other
5867	City Island Avenue & Rochelle Street	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5869	City Island Avenue & Horton Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5874	City Island Avenue & Reynold Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5877	City Island Avenue & Winters Street	3	1	2	0	1	0	0	0	0	0	0	1	0	0	0	0	0	2
5878	City Island Avenue & Centre Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5879	City Island Avenue & Schofield Street	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5880	City Island Avenue & Carroll Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5882	City Island Avenue & Fordham Street	2	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1
5883	City Island Avenue & Bay Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5886	City Island Avenue & Reville Street	2	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2
5887	City Island Avenue & Ditmars Street	3	1	2	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1
5888	City Island Avenue & Bowne Street	2	2	0	0	2	0	0	0	0	0	0	1	1	0	0	0	0	0
5889	City Island Avenue & Beach Street	3	1	2	0	5	0	0	0	0	0	0	1	0	0	0	0	0	0
5890	City Island Avenue & Cross Street	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
5891	City Island Avenue & Bridge Street	5	2	3	0	1	0	0	0	0	0	2	0	0	0	0	0	0	0
5881	City Island Avenue & City Island Road	7	4	3	0	2	0	0	0	0	0	2	1	0	0	0	0	0	1
5348	City Island Road & City Island Rd TU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5336	City Island Road & Shore Road	6	2	4	0	8	0	0	0	0	0	0	1	0	1	0	0	0	0
5347	City Island Road & Shore Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5353	Park Drive & City Island Road	2	2	0	0	3	0	0	0	0	0	0	1	0	0	0	0	0	1
5349	Park Drive & City Island Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	**40**	**19**	**21**	**0**	**24**	**2**	**1**	**0**	**0**	**0**	**4**	**6**	**1**	**1**	**1**	**0**	**0**	**8**

TABLE 6-4

Summary of Traffic Accidents - 2000

Node #	Intersection Name	Total Accidents	Reported	Non-Reported	Fatal	Injury	Pedestrian	Bicyclist	Fixed Object	Wet Road	Night Accidents	Left Turn	Rear End	Overtaking	Right Angle	Right Turn	Head On	Sideswipe	Other
5867	City Island Avenue & Rochelle Street	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5869	City Island Avenue & Horton Street	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5874	City Island Avenue & Reynold Street	3	1	2	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0
5877	City Island Avenue & Winters Street	3	2	1	0	10	0	0	0	0	0	0	2	0	0	0	0	0	0
5878	City Island Avenue & Centre Street	3	2	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
5879	City Island Avenue & Schofield Street	6	3	3	0	3	0	0	0	0	0	0	2	0	0	0	0	0	1
5880	City Island Avenue & Carroll Street	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5882	City Island Avenue & Fordham Street	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5883	City Island Avenue & Bay Street	2	1	1	0	2	0	0	0	0	0	0	1	0	0	0	0	0	0
5886	City Island Avenue & Reville Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5887	City Island Avenue & Ditmars Street	5	0	5	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
5888	City Island Avenue & Bowne Street	2	2	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	1
5889	City Island Avenue & Beach Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5890	City Island Avenue & Cross Street	2	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
5891	City Island Avenue & Bridge Street	4	1	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	1
5881	City Island Avenue & City Island Road	5	4	1	0	3	0	0	0	0	0	0	1	1	0	0	0	1	1
5348	City Island Road & City Island Rd TU	3	2	1	0	4	0	0	0	0	0	0	1	1	0	0	0	0	0
5336	City Island Road & Shore Road	13	4	9	0	1	0	0	0	0	0	0	2	1	0	0	0	0	1
5347	City Island Road & Shore Road	7	7	0	0	4	0	0	0	0	0	1	3	1	1	0	0	0	1
5353	Park Drive & City Island Road	2	2	0	0	3	0	0	0	0	0	0	1	0	0	0	0	0	1
5349	Park Drive & City Island Road	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
	TOTAL	**67**	**34**	**33**	**0**	**35**	**0**	**1**	**0**	**0**	**0**	**1**	**15**	**6**	**1**	**1**	**0**	**1**	**9**

TABLE 6-5

Summary of Traffic Accidents - 2001

Node #	Intersection Name	Total Accidents	Reported	Non-Reported	Fatal	Injury	Pedestrian	Bicyclist	Fixed Object	Wet Road	Night Accidents	Left Turn	Rear End	Overtaking	Right Angle	Right Turn	Head On	Sideswipe	Other
5867	City Island Avenue & Rochelle Street	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5869	City Island Avenue & Horton Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5874	City Island Avenue & Reynold Street	1	1	0	0	7	0	0	0	1	1	0	1	0	0	0	0	0	0
5877	City Island Avenue & Winters Street	4	2	2	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
5878	City Island Avenue & Centre Street	2	2	0	0	1	0	0	0	1	1	0	0	1	0	0	0	0	1
5879	City Island Avenue & Schofield Street	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
5880	City Island Avenue & Carroll Street	1	1	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0
5882	City Island Avenue & Fordham Street	3	2	1	0	2	0	0	0	1	0	0	0	0	0	0	0	2	0
5883	City Island Avenue & Bay Street	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5886	City Island Avenue & Reville Street	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
5887	City Island Avenue & Ditmars Street	5	2	3	0	3	0	0	0	0	1	1	0	0	0	0	0	0	1
5888	City Island Avenue & Bowne Street	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5889	City Island Avenue & Beach Street	2	1	1	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0
5890	City Island Avenue & Cross Street	6	1	5	0	1	0	0	0	0	1	0	1	0	0	0	0	0	0
5891	City Island Avenue & Bridge Street	5	1	4	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0
5881	City Island Avenue & City Island Road	4	1	3	0	6	0	0	0	0	1	0	1	0	0	0	0	0	0
5348	City Island Road & City Island Rd TU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5336	City Island Road & Shore Road	8	5	3	0	5	0	0	0	2	1	1	2	0	1	0	0	1	0
5347	City Island Road & Shore Road	2	2	0	0	1	0	0	0	1	1	0	1	0	1	0	0	0	0
5353	Park Drive & City Island Road	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5349	Park Drive & City Island Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	**49**	**23**	**26**	**0**	**30**	**0**	**0**	**0**	**7**	**9**	**3**	**9**	**2**	**2**	**0**	**0**	**4**	**3**

7.0 PARKING ANALYSIS

Parking is a key element in the operation of any traffic and transportation system. An inadequate supply of parking facilities (both on-street and off-street) could negatively impact roadway capacity as motorists may park illegally, double park, or drive around searching for a parking space. Since many of City Island's most popular restaurants are located on the southern tip of the island, visitors must drive the entire length of island before searching for parking at either restaurant parking lots, which are usually filled to capacity during the summer months, or on-street parking, which is very limited. This parking analysis seeks to:

- Determine parking supply and demand in the study area and identify critical shortfalls.
- Examine possibilities to utilize more efficiently the existing on- and off-street parking facilities in the study area.

7.1 Existing Parking

City Island's on-street and off-street parking supply is inadequate to meet the demands of residents and visitors during the summer peak. Although there are a few public off-street parking lots and several privately owned off-street lots (reserved for restaurants), the parking demand is not met in the summer. Consequently, many residents oppose visitors parking on residential streets.

The parking survey was conducted during the weekday peak hours (8-9 AM, 1-2 PM and 5-6 PM), and Saturday/Sunday (12-2 PM and 6-7PM) midday and evening peak hours; it inventoried all on-street and off-street parking facilities within the study area. It also assessed parking regulations, capacity, and peak hour accumulation. Currently, there are no facilities in the study area with a parking fee structure.

7.2 On-Street Parking

There are approximately 1,068 on-street parking spaces within the study area (all on City Island), which includes 282 parking spaces on City Island Avenue, 604 on local cross streets, and 182 on Minnieford, King, William and Hunter Avenues, which run parallel to City Island Avenue. Tables 7-1, 7-2, and 7-3 show legal capacities and utilization rates for the weekday and weekend peak hours for the on-street facilities. Most of the local streets on City Island and some parts of

City Island Avenue do not have any parking signs or regulations. On these streets, parking is permitted only on one side of the street and restricted on the other side with 'No Parking Anytime' regulation, or no signs in some locations. As a result, due to the scarcity of parking spaces, some residents and visitors park in those locations without posted regulations.

Currently, alternate side parking regulations do not exist on City Island. Typical parking regulations on the island are: 'No Parking Anytime', 'No Standing Anytime', 'Bus Stop', 'No Parking School Days' (7AM-4PM), and 'No Parking for Saturday and Sunday holidays' (between May 15 and September 30). Exhibit 7-1 shows all existing parking regulations on the City Island streets.

The parking survey showed that on-street parking utilization rates were higher on City Island Avenue than on the side streets (see Tables 7-1a and 7-1b). Parking utilization rates on both sides of City Island Avenue indicates that 70% of all available parking space were occupied during the weekday AM peak hours, 71% during the midday peak hour, and 85% during the PM peak hour. For Saturday, the utilization rate was 78% during the midday peak hour and 90% during the evening peak hour. The utilization rate was highest on Sunday with 86% during the midday peak hour and 92% during the evening peak hour. On-street parking along City Island Avenue at the sections between Pilot and Belden Streets, Ditmars and Fordham Streets, and Bridge and Beach Streets has been constantly utilized or were at capacity due to recreational and residential activities. The utilization rate for local streets were 63%, 53%, and 59% during the AM, midday and PM peak hours for weekdays; the parking utilization rates for the Saturday and Sunday midday and evening peak hours were 75%, 86%, 80% and 84% (see Tables 7-2a and 7-2b).

The utilization rates for local streets, parallel to City Island Avenue (Minnieford, King, William, and Hunter Avenues), were 71%, 68% and 84% during the AM, midday, and PM peak hours for the weekdays, and 67%, 72%, 77% and 83% during the Saturday and Sunday (midday and evening) peak hours (see Tables 7-3a and 7-3b).

The on-street parking survey indicates that some local streets are utilized 100% while others were 50% or less during the various peak hours.

Exhibit 7-1
On-Street Parking Regulations

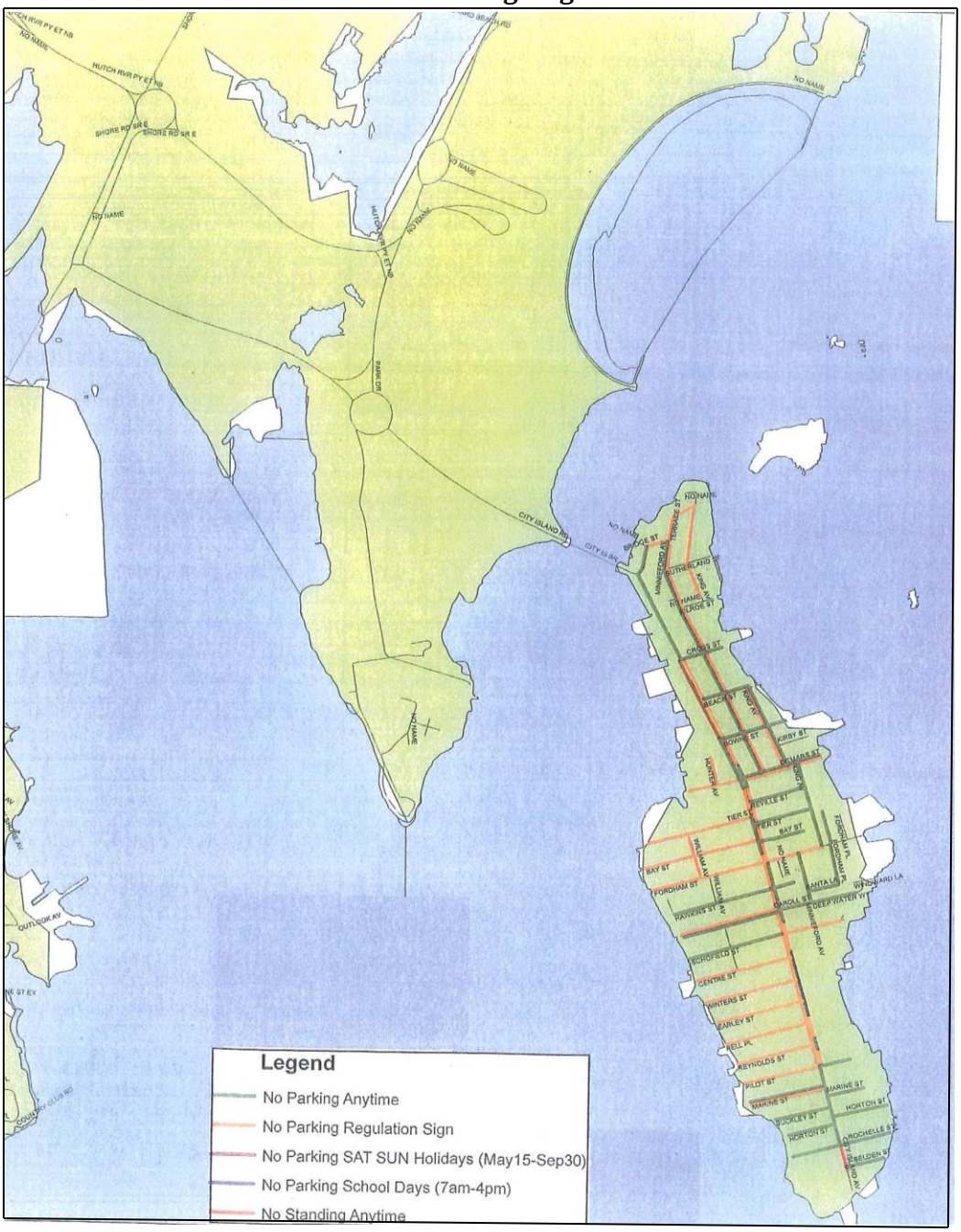


TABLE 7-1a
City Island Avenue - Legal Capacity and Utilitization Rates

Roadway City Island Avenue	Legal Capacity (#)	Utilization Rate Weekdays AM Peak (#)	AM Peak (%)	MD Peak (#)	MD Peak (%)	PM Peak (#)	PM Peak (%)	On-Str. Parking Regulations*
1. b/w Bridge & Cross Streets (East Side)	15	7	47	8	53	10	67	O / O
2. b/w Bridge & Beach Streets (West Side)	18	15	83	17	94	18	100	O / ●
3. b/w Cross & Beach Streets (East Side)	None	None	None	None	None	None	None	O / X / ●
4. b/w Beach & Bowne Streets (East Side)	15	10	67	13	87	12	80	X / X
4A. b/w Beach & Bowne Streets (West Side)	10	8	80	10	100	7	70	O / X
5. b/w Bowne & Ditmars Streets (East Side)	12	10	83	11	92	12	100	X / X
5A b/w Bowne & Ditmars Streets (West Side)	18	11	61	12	67	16	89	O / X
6. b/w Ditmars & Reville Streets (East Side)	8	5	63	2	25	6	75	X / X
7. b/w Ditmars & Reville Streets (West Side)	6	5	83	5	83	6	100	O / X
8. b/w Reville & Tier Streets (East Side)	6	4	67	6	100	5	83	O / X
9. b/w Tier & Bay Streets (West Side)	5	5	100	5	100	4	80	X / O
10. Bay & Fordham Streets (West Side)	9	7	78	8	89	5	56	X / X
11. b/w Bay & Fordham Streets (East Side)	6	5	83	6	100	6	100	X / X
12. b/w Fordham & Hawkins Streets (West Side)	7	6	86	7	100	6	86	X / X
12A. b/w Fordham & Hawkins Streets (East Side)	12	9	75	10	83	11	92	O / X
13. b/w Hawkins & Carrol Streets (West Side)	9	7	78	9	100	9	100	O / X
13A. b/w Hawkins & Caroll Streets (East Side)	8	6	75	7	88	8	100	O / X
14. b/w Caroll & Schofield Streets (West Side)	8	6	75	6	75	8	100	X / X
14A. b/w Caroll & Schofield Street (East Side)	10	8	80	5	50	8	80	X / X
15. b/w Schofield & Centre Street (West Side)	8	7	88	5	63	8	100	X / X
15A. b/w Schofield & Centre Street (East Side)	8	None	None	None	None	6	75	X / X / ▲
16. b/w Centre & Winters Streets (West Side)	5	4	80	5	100	5	100	X / X
17. b/w Winters & Early Street (West Side)	6	5	83	5	83	6	100	X / X
18. b/w Early Street & Pell Place (West Side)	8	7	88	5	63	8	100	X / X
19. b/w Pell Place & Reynold Street (West Side)	4	None	None	2	50	None	None	X / X
20. b/w Reynold & Pilot Streets (West Side)	6	5	83	4	67	6	100	O / O
21. b/w Pilot & Marine Streets (West Side)	10	7	70	5	50	9	90	O / X
21A. b/w Pilot & Marine Streets (East Side)	10	7	70	5	50	8	80	O / X
22. b/w Marine & Buckley Streets (West Side)	12	7	58	4	33	8	67	No Thru Passage/X
23. b/w Buckley & Horton Streets (West Side)	10	6	60	6	60	8	80	O / O
24. b/w Marine & Horton Street (East Side)	7	6	86	5	71	7	100	O / O
25. b/w Horton & Rochelle Street (West Side)	4	2	50	1	25	3	75	O / O
25A. b/w Horton & Rochelle Streets (East Side)	2	1	50	2	100	1	50	O / O
26. b/w Rochelle & Belden Streets (East Side)	None	None	None	None	None	None	None	O / O
TOTAL	**282**	**198**	**70**	**201**	**71**	**240**	**85**	

(*) Simbol for parking regulation codes: No Parking Anytime - O; No Parking Regulation Sign - X; No Parking Available/No Cars - None

No Parking School Days (7AM-4PM) - ▲ ; No Parking Sat - Sun holidays (May 15-Sept 30) - ●

TABLE 7-1b
City Island Avenue - Legal Capacity and Utilitization Rates

Roadway City Island Avenue	Legal Capacity (#)	Utilization Rate							
		Saturday				Sunday			
		MD Peak		PM Peak		MD Peak		PM Peak	
		(#)	(%)	(#)	(%)	(#)	(%)	(#)	(%)
1. b/w Bridge & Cross Streets (East Side)	15	9	60	9	60	10	60	14	93
2. b/w Bridge & Beach Streets (West Side)	18	16	89	18	100	15	95	16	89
3. b/w Cross & Beach Streets (East Side)	None	None	None	None	None	None	None	None	None
4. b/w Beach & Bowne Streets (East Side)	15	12	80	13	87	13	80	14	93
4A. b/w Beach & Bowne Streets (West Side)	10	9	90	9	90	10	100	9	90
5. b/w Bowne & Ditmars Streets (East SIDE)	12	11	92	11	92	12	92	11	92
5A b/w Bowne & Ditmars Streets (West Side)	18	14	78	15	83	16	70	15	83
6. b/w Ditmars & Reville Streets (East Side)	8	5	63	6	75	7	80	7	88
7. b/w Ditmars & Tier Streets (West West)	6	4	67	6	100	5	80	6	100
8. b/w Reville & Tier Streets (East Side)	6	5	83	6	100	5	80	6	100
9. b/w Tier & Bay Streets (West Side)	5	5	100	9	180	5	80	5	100
10. Bay & Fordham Streets (West Side)	9	7	78	5	56	8	80	7	78
11. b/w Tier & Fordham Streets (East Side)	6	6	100	6	100	6	80	6	100
12. b/w Fordham & Hawkins Streets (West Side)	7	7	100	6	86	7	80	7	100
12A. b/w Fordham & Hawkins Streets (East Side)	12	11	92	11	92	12	80	11	92
13. b/w Hawkins & Carrol Streets (West Side)	9	8	89	9	100	9	80	9	100
13A. b/w Hawkins & Caroll Streets (East Side)	8	6	75	8	100	7	80	8	100
14. b/w Caroll & Schofield Streets (West Side)	8	7	88	7	88	7	80	8	100
14A. b/w Caroll & Schofield Street (East Side)	10	7	70	10	100	8	80	9	90
15. b/w Schofield & Centre Street (West Side)	8	6	75	8	100	6	80	8	100
15A. b/w Schofield & Pilot Street (East Side)	5	4	80	3	60	4	80	3	60
16. b/w Centre & Winters Streets (West Side)	5	4	80	5	100	4	80	5	100
17. b/w Winters & Early Street (West Side)	6	5	83	5	83	6	80	6	100
18. b/w Early Street & Pell Place (West Side)	8	7	88	7	88	6	80	8	100
19. b/w Pell Place & Reynold Street (West Side)	4	3	75	None	None	3	80	None	None
20. b/w Reynold & Pilot Streets (West Side)	6	5	83	6	100	5	80	6	100
21. b/w Pilot & Marine Streets (West Side)	10	7	70	9	90	8	80	10	100
21A. b/w Pilot & Marine Streets (East Side)	10	6	60	8	80	7	80	9	90
22. b/w Marine & Buckley Streets (West Side)	12	8	67	12	100	10	80	11	92
23. b/w Buckley & Horton Streets (West Side)	10	5	50	10	100	8	80	9	90
24. b/w Marine & Horton Street (East Side)	7	5	71	7	100	6	80	7	100
25. b/w Horton & Rochelle Street (West Side)	4	2	50	4	100	4	80	4	100
25A. b/w Horton & Rochelle Streets (East Side)	2	1	50	2	100	2	80	2	100
26. b/w Rochelle & Belden Streets (East Side)	None	None	None	None	None	None	None	None	None
TOTAL	**279**	**217**	**78**	**250**	**90**	**241**	**86**	**256**	**92**

None - Simbol for parking regulation code: No Parking Available / No Parked Cars

TABLE 7-2a

Cross Streets on City Island - Legal Capacity and Utilitization Rates

Roadway Street / Avenue	Legal Capacity (#)	Utilization Rate						On-Str. Parking Regulations*
		Weekdays						
		AM Peak		MD Peak		PM Peak		
	North/South	(#)	(%)	(#)	(%)	(#)	(%)	North/South Side
1. Bridge Street (East from City Island Avenue)	None	None	None	None	None	None	None	O / O
2. Cross Street (East from City Island Avenue)	None	None	None	None	None	None	None	O / O
3. Beach Street (East from City Island Avenue)	None / 9	7	78	4	44	9	100	O / X
4. Bowne Street (West from City Island Avenue)	None	None	None	None	None	None	None	X / X
4A. Bowne Street (East from City Island Avenue)	None / 13	10	77	10	77	12	92	O / X
5. Ditmars Street (West from City Island Avenue)	9 / 9	4	22	6	33	5	28	X / X
5A. Ditmars Street (East from City Island Avenue)	None / 16	16	100	12	75	14	88	O / X
6. Tier Street (West from City Island Avenue)	9 / 9	18	100	18	100	18	100	X / X
6A. Tier Street (East from City Island Avenue)	None / 20	15	75	11	55	12	60	O / X
7. Reville Street (East from City Island Avenue)	None / 23	11	48	15	65	12	52	O / X
8. Bay Street (West from City Island Avenue)	12 / None	12	100	5	42	6	50	X / O
9. Fordham Street (West from City Island Avenue)	23 / 23	26	57	16	35	17	37	X / X
9A. Fordham Street (East from City Island Avenue)	12 / 8	18	90	18	90	18	90	X / X
10. Hawkins Street (West from City Island Avenue)	None	None	None	None	None	None	None	X / X
10A. Hawkins Street (East from City Island Avenue)	9 / None	9	100	7	78	9	100	X / O
11. Caroll Street (West from City Island Avenue)	18 / None	12	67	10	56	12	67	X / O
11A. Caroll Street (East from City Island Avenue)	None / 13	11	85	3	23	10	77	O / X
12. Shofield Street (West from City Island Avenue)	None / 22	16	73	12	55	11	50	X / X
12A. Shofield Street (East from City Island Avenue)	7 / 12	14	74	13	68	17	89	X / X
13. Centre Street (West from City Island Avenue)	18 / 13	16	52	21	68	16	52	X / X
14. Winters Street (West from City Island Avenue)	26 / 26	38	73	28	54	36	69	X / X
15. Earley Street (West from City Island Avenue)	30 / 20	26	52	20	40	25	50	X / X
16. Pell Place (West from City Island Avenue)	27 / 30	30	53	26	46	24	42	X / X
17. Reynold Street (West from City Island Avenue)	25 / 32	17	30	22	39	30	53	X / X
18. Pilot Street (West from City Island Avenue)	None / 28	17	61	15	54	12	43	X / X
18A. Pilot Street (East from City Island Avenue)	None	None	None	None	None	None	None	O / O
19. Marine Street (West from City Island Avenue)	None / 28	17	61	18	64	12	43	O / X
19A. Marine Street (East from City Island Avenue)	None / 7	7	100	3	43	7	100	O / X
20. Buckley Street (West from City Island Avenue)	None / 18	14	78	10	56	12	67	No Thru Passage/X
21. Horton Street (West from City Island Avenue)	None	None	None	None	None	None	None	O / O
21A. Horton Street (East from City Island Avenue)	None	None	None	None	None	None	None	O / O
22. Rochelle Street (West from City Island Avenue)	None	None	None	None	None	None	None	O / O
22A. Rochelle Street (East from City Island Avenue)	None	None	None	None	None	None	None	O / O
23. Belden Street (East from City Island Avenue)	None	None	None	None	None	None	None	O / O
TOTAL	**604**	**381**	**63**	**323**	**53**	**356**	**59**	

(*) Simbol for parking regulation codes: No Parking Anytime - O; No Parking Regulation Sign - X; No Parking Available - None

TABLE 7-2b

Cross Streets on City Island - Legal Capacity and Utilitization Rates

Roadway City Island Avenue	Legal Capacity (#)	Utilization Rate							
		Saturday				Sunday			
		MD Peak		PM Peak		MD Peak		PM Peak	
		(#)	(%)	(#)	(%)	(#)	(%)	(#)	(%)
1. Bridge Street (East from City Island Avenue)	None	None	None	None	None	None	None	None	None
2. Cross Street (East from City Island Avenue)	None	None	None	None	None	None	None	None	None
3. Beach Street (East from City Island Avenue)	None / 9	5	56	8	89	8	89	9	100
4. Bowne Street (West from City Island Avenue)	None / None	None	None	None	None	None	None	None	None
4A. Bowne Street (East from City Island Avenue)	None / 13	11	85	12	92	12	92	11	85
5. Ditmars Street (West from City Island Avenue)	9 / 9	5	28	12	67	12	67	14	78
5A. Ditmars Street (East from City Island Avenue)	None / 16	13	81	14	88	13	81	15	94
6. Tier Street (West from City Island Avenue)	9 / 9	15	83	16	89	17	94	17	94
6A. Tier Street (East from City Island Avenue)	None / 20	14	70	15	75	14	70	19	95
7. Reville Street (East from City Island Avenue)	None / 23	18	78	19	83	19	83	21	91
8. Bay Street (West from City Island Avenue)	12 / None	7	58	11	92	8	67	10	83
9. Fordham Street (West from City Island Avenue)	23 / 23	26	57	42	91	52	113	34	74
9A. Fordham Street (East from City Island Avenue)	12 / 8	17	85	19	95	18	90	18	90
10. Hawkins Street (West from City Island Avenue)	None	None	None	None	None	None	None	None	None
10A. Hawkins Street (East from City Island Avenue)	9 / None	7	78	9	100	8	89	9	100
11. Caroll Street (West from City Island Avenue)	18 / None	18	100	17	94	16	89	16	89
11A. Caroll Street (East from City Island Avenue)	None / 13	12	92	11	85	9	69	10	77
12. Shofield Street (West from City Island Avenue)	None / 22	18	82	21	95	19	86	20	91
12A. Shofield Street (East from City Island Avenue)	7 / 12	14	74	17	89	15	79	19	100
13. Centre Street (West from City Island Avenue)	18 / 13	21	68	27	87	25	81	28	90
14. Winters Street (West from City Island Avenue)	26 / 26	34	65	44	85	44	85	49	94
15. Earley Street (West from City Island Avenue)	30 / 20	42	84	25	50	46	92	25	50
16. Pell Place (West from City Island Avenue)	27 / 30	43	75	53	93	46	81	41	72
17. Reynold Street (West from City Island Avenue)	25 / 32	47	82	55	96	32	56	49	86
18. Pilot Street (West from City Island Avenue)	None / 28	25	89	22	79	17	61	25	89
18A. Pilot Street (East from City Island Avenue)	None	None	None	None	None	None	None	None	None
19. Marine Street (West from City Island Avenue)	None / 28	23	82	24	86	15	54	25	89
19A. Marine Street (East from City Island Avenue)	None / 7	5	71	7	100	6	86	7	100
20. Buckley Street (West from City Island Avenue)	None / 18	14	78	17	94	15	83	17	94
21. Horton Street (West from City Island Avenue)	None	None	None	None	None	None	None	None	None
21A. Horton Street (East from City Island Avenue)	None	None	None	None	None	None	None	None	None
22. Rochelle Street (West from City Island Avenue)	None	None	None	None	None	None	None	None	None
22A. Rochelle Street (East from City Island Avenue)	None	None	None	None	None	None	None	None	None
23. Belden Street (East from City Island Avenue)	None	None	None	None	None	None	None	None	None
TOTAL	**604**	**454**	**75**	**517**	**86**	**486**	**80**	**508**	**84**

None - Simbol for parking regulation code: No Parking Available

TABLE 7-3a
King, Minneford, Hunter, William Avenues
Legal Capacity and Utilitization Rates

Roadway Avenue/Street	Legal Capacity	Utilization Rate						On-Str. Parking Regulations*
		Weekdays						
		AM Peak		MD Peak		PM Peak		
MINNEFORD AVENUE:	(#)	(#)	(%)	(#)	(%)	(#)	(%)	
1. b/w Terrace & Sutherland Sts. (East Side)	15	7	47	8	53	10	67	X / X
2. b/w Terrace & Cross Sts. (West Side)	None	None	None	None	None	None	None	O / O
3. b/w Sutherland & Kilroe Sts. (East Side)	18	15	83	17	94	18	100	X / X
4. b/w Kilroe & Cross Sts. (East Side)	15	10	67	13	87	12	80	X / ▲
5. b/w Cross & Beach Sts. (West Side)	None	None	None	None	None	None	None	O / O
5A. b/w Cross & Beach Sts. (East Side)	12	10	83	11	92	12	100	X / X
6. b/w Beach & Bowne Sts. (West Side)	None	None	None	None	None	None	None	O / O
6A. b/w Beach & Bowne Sts. (East Side)	8	5	63	2	25	6	75	X / X
7. b/w Bowne & Ditmars Sts. (West Side)	None	None	None	None	None	None	None	O / O
7A. b/w Bowne & Ditmars Sts. (East Side)	6	4	67	6	100	5	83	X / X
KING AVENUE:								
1. b/w Terrace & Sutherland Sts. (West Side)	9	7	78	8	89	5	56	X / X
1A. b/w Terrace & Sutherland Sts. (East Side)	None	None	None	None	None	None	None	O / X
2. b/w Sutherland & Kilroe Sts. (East Side)	None	None	None	None	None	None	None	O / X
2A. b/w Sutherland & Kilroe Sts. (West Side)	12	9	75	10	83	11	92	O / X
3. b/w Beach & Bowne Sts. (East Side)	None	None	None	None	None	None	None	O / X
3A. b/w Beach & Bowne Sts. (West Side)	8	6	75	7	88	8	100	O / X
4. b/w Bowne & Kirby Sts. (East Side)	None	None	None	None	None	None	None	O / X
4A. b/w Bowne & Kirby Sts. (West Side)	10	8	80	5	50	8	80	X / X
5. b/w Kirby & Ditmars Sts. (East Side)	None	None	None	None	None	None	None	O / X
5. b/w Kirby & Ditmars Sts. (West Side)	8	7	88	5	63	8	100	X / X
6. b/w Ditmars & Reville Sts. (East/West Side)	None	None	None	None	None	None	None	O / X
7. b/w Reville & Tier Sts. (East/West Side)	None	None	None	None	None	None	None	O / X
8. b/w Tier & Fordham Sts. (East/West Side)	None	None	None	None	None	None	None	O / X
WILLIAM AVENUE:								
1. b/w Ditmars & Tier Sts. (East Side)	Closed	Private		Driway				O / X
1A. b/w Ditmars & Tier Sts. (West Side)	Closed	Private		Driway				O / X
2. b/w Tier & Bay Sts. (East Side)	10	7	70	5	50	8	80	O / X
2A. b/w Tier & Bay Sts. (West Side)	12	7	58	4	33	8	67	O / X
3. b/w Bay & Fordham Sts. (East Side)	10	6	60	6	60	8	80	O / X
3A. b/w Bay & Fordham Sts. (West Side)	7	6	86	5	71	7	100	O / X
4. b/w Fordham & Hawkins Sts. (East Side)	4	2	50	1	25	3	75	O / X
4A. b/w Fordham & Hawkins Sts. (West Side)	2	1	50	2	100	1	50	O / X
5. b/w Caroll & Schofield Sts. (East Side)	None	None	None	None	None	None	None	O / O
5A. b/w Caroll & Schofield Sts. (West Side)	None	None	None	None	None	None	None	O / O
6. b/w Schofield & Centre Sts. (East Side)	None	None	None	None	None	None	None	O / O
6A. b/w Schofield & Centre Sts. (West Side)	None	None	None	None	None	None	None	O / O
HUNTER AVENUE:								O / O
1. b/w Bowne & Ditmars Sts. (East Side)	6	5	83	4	67	6	100	O / X
1A. b/w Bowne & Ditmars Sts. (West Side)	10	7	70	5	50	9	90	O / X
TOTAL:	**182**	**129**	**71**	**124**	**68**	**153**	**84**	

(*) Simbol for parking regulation codes: No Parking Anytime/No Standing Anytime - O; No Parking Regulation Sign - X; No Parking Available - None
No Parking School Days (7AM-4PM) - ▲

TABLE 7-3b
King, Minneford, Hunter, and William Avenues
Legal Capacity and Utilitization Rates

Roadway Avenue/Street	Legal Capacity	Utilization Rate							
		Saturday				Sunday			
		MD Peak		PM Peak		MD Peak		PM Peak	
MINNEFORD AVENUE:	(#)	(#)	(%)	(#)	(%)	(#)	(%)	(#)	(%)
1. b/w Terrace & Sutherland Sts.(East Side)	15	7	47	9	60	11	95	12	80
2. b/w Terrace & Cross Sts. (West Side)	None	None	None	None	None	None	None	None	None
3. b/w Sutherland & Kilroe (East Side)	18	15	83	17	94	15	80	17	94
4. b/w Kilroe & Cross Sts. (East Side)	15	11	73	13	87	12	100	14	93
5. b/w Cross & Beach Sts. (West Side)	None	None	None	None	None	None	None	None	None
5A. b/w Cross & Beach Sts. (East Side)	12	10	83	11	92	11	70	12	100
6. b/w Beach & Bowne Sts. (West Side)	None	None	None	None	None	None	None	None	None
6A. b/w Beach & Bowne Sts.(East Side)	8	5	63	6	75	6	80	7	88
7. b/w Bowne & Ditmars Sts. (West Side)	None	None	None	None	None	None	None	None	None
7A. b/w Bowne & Ditmars Sts. (East Side)	6	5	83	6	100	5	80	6	100
KING AVENUE:									
1. b/w Terrace & Sutherland Sts. (West Side)	9	6	67	7	78	6	80	8	89
1A. b/w Terrace & Sutherland Sts. (East Side)	None	None	None	None	None	None	None	None	None
2. b/w Sutherland & Kilroe Sts. (East Side)	None	None	None	None	None	None	None	None	None
2A. b/w Sutherland & Kilroe Sts. (West Side)	12	8	67	9	75	10	80	9	75
3. b/w Beach & Bowne Sts. (East Side)	None	None	None	None	None	None	None	None	None
3A. b/w Beach & Bowne Sts. (West Side)	8	6	75	7	88	6	80	7	88
4. b/w Bowne & Kirby Sts. (East Side)	None	None	None	None	None	None	None	None	None
4A. b/w Bowne & Ditmars Sts. (West Side)	10	7	70	8	80	6	80	8	80
5. b/w Kirby & Ditmars Sts. (East Side)	None	None	None	None	None	None	None	None	None
6. b/w Ditmars & Reville Sts. (West Side)	8	5	63	6	75	7	80	7	88
6A. b/w Ditmars & Fordham Sts. (East Side)	None	None	None	None	None	None	None	None	None
7. b/w Reville & Tier Sts. (West Side)	None	None	None	None	None	None	None	None	None
8. b/w Tier & Fordham Sts. (West Side)	None	None	None	None	None	None	None	None	None
WILLIAM AVENUE:									
1. b/w Ditmars & Tier Sts. (East Side)	Closed	Private Drive							
1A. b/w Ditmars & Tier Sts. (West Side)	Closed	Private Drive							
2. b/w Tier & Bay Sts. (East Side)	10	7	70	5	50	8	80	7	70
2A. b/w Tier & Bay Sts. (West Side)	12	7	58	4	33	8	67	11	92
3. b/w Bay & Fordham Sts. (East Side)	10	6	60	6	60	8	80	7	70
3A. b/w Bay & Fordham Sts. (West Side)	7	6	86	5	71	7	100	5	71
4. b/w Fordham & Hawkins Sts. (East Side)	4	2	50	1	25	3	75	1	25
4A. b/w Fordham & Hawkins Sts. (West Side)	2	1	50	2	100	1	50	2	100
5. b/w Caroll & Schofield Sts. (East Side)	None	None	None	None	None	None	None	None	None
5A. b/w Caroll & Schofield Sts. (West Side)	None	None	None	None	None	None	None	None	None
6. b/w Schofield & Centre Sts. (East Side)	None	None	None	None	None	None	None	None	None
6A. b/w Schofield & Centre Sts. (West Side)	None	None	None	None	None	None	None	None	None
HUNTER AVENUE:									
1. b/w Bowne & Ditmars Sts. (East Side)	5	1	25	2	50	2	80	2	50
1A. b/w Bowne & Ditmars Sts. (West Side)	10	6	60	7	70	8	80	9	90
TOTAL:	**181**	**121**	**67**	**131**	**72**	**140**	**77**	**151**	**83**

None - Simbol for parking regulation code: No Parking Available

7.3 Off-Street Parking

Forty-three parking lots (no garages) with a total capacity of 1,612 spaces provide off-street parking on City Island; additionally six parking lots in the Pelham Bay Park area that provide 6,642 parking spaces. There are also 15 boatyard lots with 1,411 spaces that are used to lay up boats on the island. Most of the off-street parking facilities on City Island are owned by the local restaurants, marinas and stores. Exhibits 7-2 and 7-3 show the location and capacity of all off-street parking facilities (lots and boatyards) within the study area. Table 7-4 shows all off-street parking facilities by location, type, license capacity, and utilization rate for the selected peak periods.

The largest off-street parking facilities in the study area are located primarily adjacent to Orchard Beach, the golf courses in Pelham Bay Park and seafood restaurants and marinas located on City Island. Together these lots account for more than half of the legal capacity utilized during each of the seven peak hours. The parking lot that serves visitors to Orchard Beach has a capacity of 6,000 parking spaces. Two adjacent parking lots on Orchard Beach, which are reserved for NYPD/DPR employees, have a capacity of 70 spaces, respectively. The parking lot used by the Pelham Park Golf Clubs has capacity of approximately 400 parking spaces and is located in the north-east section of Pelham Bay Park. The Turtle Cove Golf and Baseball Field parking lot located near City Island Road has capacity of 98 parking spaces.

The largest parking lots on City Island are found in vicinity of City Island Avenue such as the See Food City parking lot (180 parking spaces), Johnny's restaurant (140 parking spaces) Sammy's restaurant (125 parking spaces), and Sea Shore restaurant (85 parking spaces). All other parking lots on City Island (mostly privately owned) are located along City Island Avenue and are reserved mostly for restaurants and marinas/yacht clubs. A few parking lots are used as boatyards to store boats on the island. The largest boatyards are located between Pilot and Scholfield Streets and have capacity more than 200 spaces, respectively.

The City Island parking lots are 19%, 59%, and 79% occupied during each of the weekday peak period, while the parking lots in the Pelham Bay Park area are 3%, 7% and 10% occupied during the same peak hours (see Table 7-4a). During the Saturday and Sunday midday and evening peak hours parking lots were 63%, 81%, 74%, and 79% occupied on City Island and 48%, 41%, 58%, and 44% occupied in Pelham Bay Park (see Table 7-4b).

Exhibit 7-2
Off-Street Parking Facilities

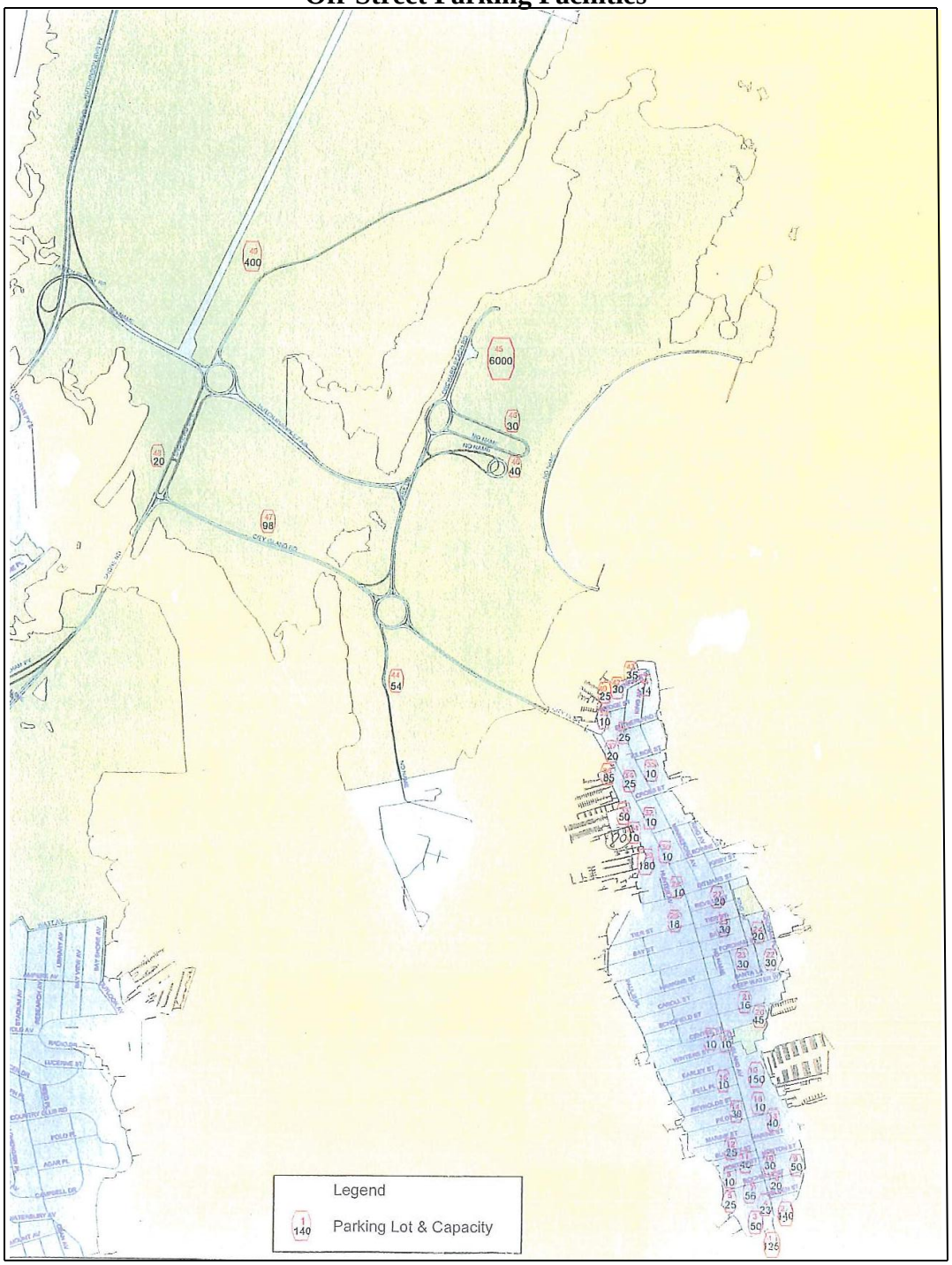


Exhibit 7-3
Off-Street Parking Facilities – Marina/Boatyards

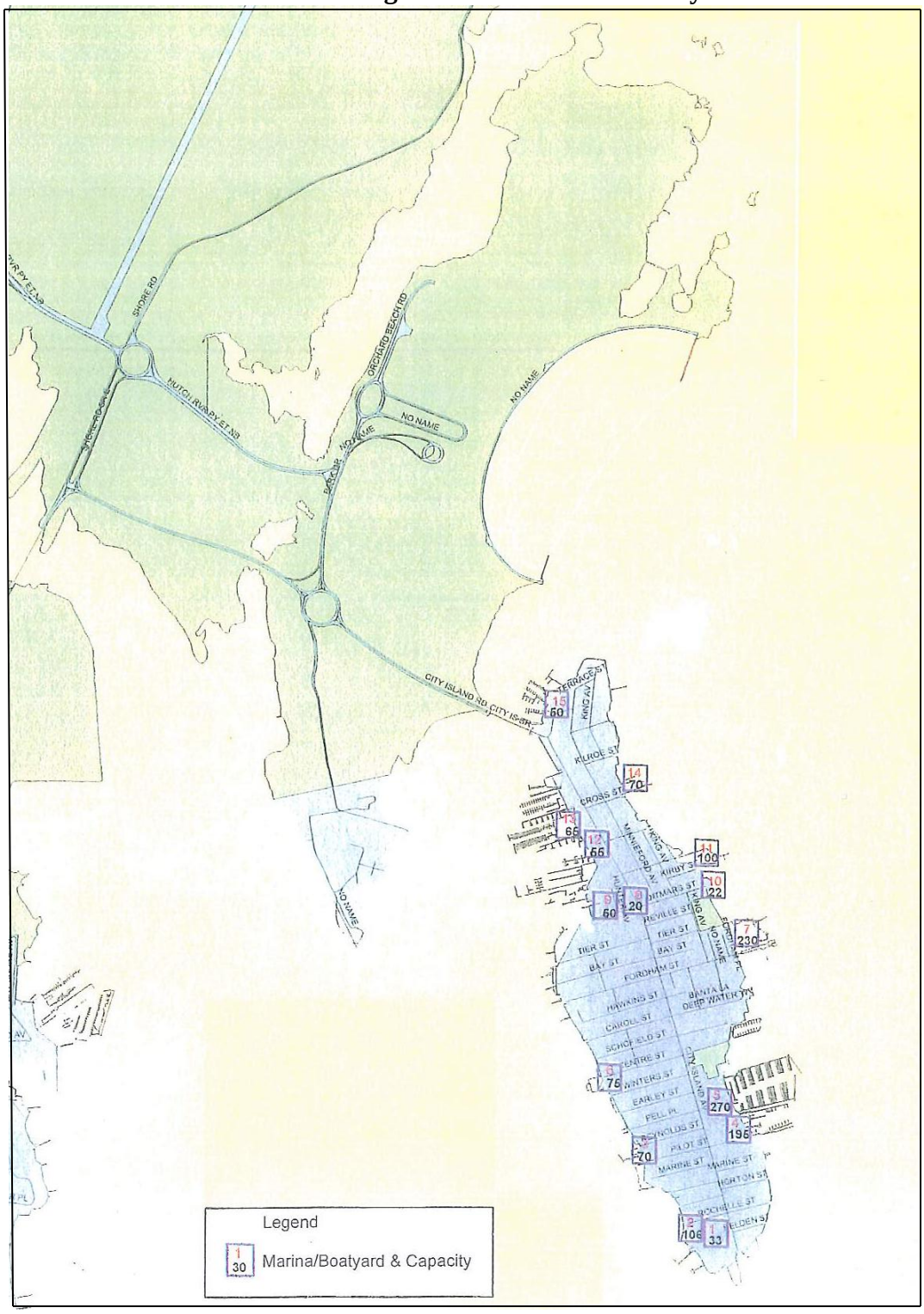


TABLE 7-4a
Off-Street Parking Facilities (Location, Legal Capacity, and Utilization Rates)

No.	Location City Island Avenue	Parking Garage / LOT	Legal Capacity (#)	Utilization Rate					
				Weekdays					
				AM Peak		MD Peak		PM Peak	
				(#)	(%)	(#)	(%)	(#)	(%)
1	Bottom tip of City Island/Sea Food Restaurant	LOT	125	14	11	94	75	100	80
2	b/w Belden Point & Street/Johnny's Restaurant	LOT	140	7	5	43	31	124	86
3	b/w Belden & Rochelle/Sea Food Restaurant	LOT	50	7	14	35	70	40	80
4	b/w Belden & Rochelle Streets/Sea Food Restaurant	LOT	23	4	17	32	139	42	183
5	b/w Belden & Rochelle Streets/Morris Yacht Club	LOT	25	4	16	32	128	42	168
6	b/w Belden & Rochelle Streets/Lobster House	LOT	20	1	5	1	5	17	85
7	b/w Rochelle & Belden Point/Neptune In Restaurant	LOT	56	0	0	20	36	24	43
8	b/w Rochelle & Horton/Marina/Boat Yard	LOT	10	4	40	7	70	6	60
9	b/w Rochelle & Horton Streets/Sammy's Restaurant	LOT	50	2	4	29	58	42	84
10	b/w Rochelle & Horton Streets/Tito Puente's Restaurant	LOT	30	2	7	21	70	28	93
11	b/w Horton & Buckley Streets/Sammy's Restaurant	LOT	40	2	5	27	68	29	73
12	b/w Buckley & Marine Streets/Trattoria Restaurant	LOT	25	15	60	18	72	26	104
13	b/w Marine & Pilot/Marina/Boat Yard	LOT	40	10	25	17	43	14	35
14	b/w Pilot & Reynolds Streets/LIDO Sea Food Restaurant	LOT	30	0	0	30	100	18	60
15	b/w Early and Pell Streets/UK Sail workers	LOT	10	8	80	8	80	7	70
16	b/w Winters & Centre Streets/Auto Repair Shop	LOT	10	4	40	6	60	12	120
17	b/w Winters & Centre Streets/Chase Bank	LOT	10	3	30	7	70	8	80
18	b/w Pilot & Scholfield/Marina/Boat Yard	LOT	10	6	60	10	100	8	80
19	b/w Pilot & Scholfield/Marina/Boat Yard	LOT	150	75	50	120	80	100	67
20	b/w Pilot & Scholfield/Marina/Boat Yard	LOT	45	11	24	18	40	14	31
21	b/w Schofield & Caroll Streets/Residential	LOT	16	4	25	9	56	13	81
22	b/w Deep Water & Banta La/Residential	LOT	30	10	33	15	50	25	83
23	b/w Banta La & Fordham Streets/Residential	LOT	30	8	28	13	43	22	73
24	b/w Fordham Place & Wineward Lane/Marina/Boat Yard	LOT	20	7	35	12	80	10	50
25	b/w Tier & Bay Streets/Residential	LOT	30	8	28	18	60	24	80
26	b/w Tier & Reville Streets/Crab Shanty Restaurant	LOT	18	5	28	15	83	19	106
27	b/w Reville & Ditmars Streets/Artie's Restaurant	LOT	20	5	25	12	60	12	60
28	b/w Ditmars & Bowne Streets/Sunoco Gas Station	LOT	10	8	90	9	90	9	90
29	b/w Bowne & Beach Streets/Sea Food City	LOT	180	7	4	59	33	129	72
30	b/w Bowne & Beach/Residential	LOT	10	3	30	5	50	8	80
31	Corner of Beach Street/Private Construction Site	LOT	10	5	50	7	70	14	140
32	b/w Beach & Cross Streets/Burcks Hardware Store	LOT	10	1	10	5	50	9	90
33	b/w Beach & Cross Streets/Marina/Yacht Club	LOT	50	0	0	27	54	40	80
34	Corner of Cross Street/American Legion	LOT	25	0	0	5	20	8	32
35	b/w Cross & Kilroe Streets/Marina/Boat Yard	LOT	10	5	60	8	80	7	70
36	b/w Cross & Bridge Streets/Sea Shore Restaurant	LOT	85	3	5	45	53	82	96
37	b/w Cross & Bridge Streets/Harbor Restaurant	LOT	80	42	53	69	86	80	100
38	b/w Kilroe & Bridge Streets/Seaview Restaurant	LOT	25	3	12	22	88	22	88
39	b/w Bridge & Sutherland Streets/Marina/Boat Yard	LOT	10	7	70	10	100	9	90
40	b/w Terrace and Bridge St/J.P.s Seafood Restaurant	LOT	25	3	10	20	80	24	96
41	b/w Bridge & Terrace Streets/Lobster House	LOT	14	7	50	9	64	13	93
42	b/w Bridge & Terrace Streets/Seafood Restaurant	LOT	30	4	13	18	60	23	77
43	b/w Bridge & Terrace Streets/Marina/Boat Yard	LOT	35	16	46	26	74	21	60
	Total Parking on City Island		**1,672**	**340**	**20**	**1013**	**61**	**1324**	**79**
	Pelham Park Area								
44	NYC Police Department / Firing Range	LOT	54	14	26	19	35	35	65
45	Orchard Beach Parking Lot	LOT	6000	63	1	210	4	352	6
46	Orchard Beach (NYPD/DPR Employees Only)	LOT	70	42	60	95	136	90	129
47	City Island Road /Turtle Cove Golf / Baseball Field	LOT	98	13	13	56	57	49	50
48	North Shore & City Island Roads / Riding Stable	LOT	20	1	4	2	8	4	20
49	Pelham Park Golf Clubs	LOT	400	58	15	106	265	100	25
	Total Parking in the Pelham Park		**6,642**	**191**	**3**	**488**	**7**	**630**	**10**

TABLE 7-4b
Off-Street Parking Facilities (Location, Legal Capacity, and Utilization Rates)

No.	LOCATION City Island Avenue	Parking Garage / LOT	Legal Capacity (#)	Utilization Rate							
				Saturday				Sunday			
				MD Peak		PM Peak		MD Peak		PM Peak	
				(#)	(%)	(#)	(%)	(#)	(%)	(#)	(%)
1	Bottom tip of City Island/Sea Food Restaurant	LOT	125	88	70	120	96	94	75	125	100
2	b/w Belden Point & Street/Johnny's Restaurant	LOT	140	85	61	154	110	124	86	150	107
3	b/w Belden & Rochelle/Sea Food Restaurant	LOT	50	38	76	49	98	40	80	47	94
4	b/w Belden & Rochelle Streets/Sea Food Restaurant	LOT	23	28	122	42	183	32	139	40	174
5	b/w Belden & Rochelle Streets/Morris Yacht Club	LOT	25	29	116	40	160	27	108	42	168
6	b/w Belden & Rochelle Streets/Lobster House	LOT	20	14	70	21	105	17	85	21	105
7	b/w Rochelle & Belden Point/Neptune In Restaurant	LOT	56	9	16	25	45	23	50	24	43
8	b/w Rochelle & Horton/Marina/Boat Yard	LOT	10	7	70	6	60	7	70	6	60
9	b/w Rochelle & Horton Streets/Sammy's Restaurant	LOT	50	39	78	51	102	42	84	49	98
10	b/w Rochelle & Horton Streets/Tito Puente's Restaurant	LOT	30	21	70	32	107	25	83	30	100
11	b/w Horton & Buckley Streets/Sammy's Restaurant	LOT	40	15	38	32	80	29	73	34	85
12	b/w Buckley & Marine Streets/Trattoria Restaurant	LOT	25	9	35	15	60	21	84	20	80
13	b/w Marine & Pilot/Marina/Boat Yard	LOT	40	17	43	14	35	17	43	14	35
14	b/w Pilot & Reynolds Streets/LIDO Sea Food Restaurant	LOT	30	21	70	30	100	18	60	30	100
15	b/w Early and Pell Streets/UK Sail workers	LOT	10	5	50	5	50	5	50	5	50
16	b/w Winters & Centre Streets/Auto Repair Shop	LOT	10	5	50	6	60	8	80	7	70
17	b/w Winters & Centre Streets/Chase Bank	LOT	10	4	40	6	60	8	80	8	80
18	b/w Pilot & Scholfield/Marina/Boat Yard	LOT	10	10	100	10	100	10	100	10	100
19	b/w Pilot & Scholfield/Marina/Boat Yard	LOT	150	120	80	110	73	120	80	100	67
20	b/w Pilot & Scholfield/Marina/Boat Yard	LOT	45	18	40	14	31	18	40	14	31
21	b/w Schofield & Caroll Streets/Residential	LOT	16	10	63	5	30	12	75	6	38
22	b/w Deep Water & Banta La/Residential	LOT	30	20	67	4	13	18	60	6	20
23	b/w Banta La & Fordham Streets/Residential	LOT	30	15	50	10	33	16	53	3	30
24	b/w Fordham Place & Wineward Lane/Marina/Boat Yard	LOT	20	12	60	10	50	12	60	10	50
25	b/w Tier & Bay Streets/Residential	LOT	30	17	57	7	23	15	50	5	17
26	b/w Tier & Reville Streets/Crab Shanty Restaurant	LOT	18	5	28	13	72	17	94	15	83
27	b/w Reville & Ditmars Streets/Artie's Restaurant	LOT	20	7	35	16	80	12	60	19	95
28	b/w Ditmars & Bowne Streets/Sunoco Gas Station	LOT	10	9	90	9	90	9	90	9	90
29	b/w Bowne & Beach Streets/Sea Food City	LOT	180	95	53	126	70	126	70	124	69
30	b/w Bowne & Beach/Residential	LOT	10	7	70	3	30	6	60	3	30
31	Corner of Beach Street/Private Construction Site	LOT	10	13	130	13	130	13	130	13	130
32	b/w Beach & Cross Streets/Burcks Hardware Store	LOT	10	7	70	7	70	8	80	8	80
33	b/w Beach & Cross Streets/Marina/Yacht Club	LOT	50	37	64	37	74	40	80	32	64
34	Corner of Cross Street/American Legion	LOT	25	5	20	12	48	5	20	8	32
35	b/w Cross & Kilroe Streets/Marina/Boat Yard	LOT	10	10	100	10	100	10	100	10	100
36	b/w Cross & Bridge Streets/Sea Shore Restaurant	LOT	85	58	68	85	100	49	58	79	93
37	b/w Cross & Bridge Streets/Harbor Restaurant	LOT	80	44	55	77	96	69	86	84	105
38	b/w Kilroe & Bridge Streets/Seaview Restaurant	LOT	25	12	48	25	100	22	88	24	96
39	b/w Bridge & Sutherland Streets/Marina/Boat Yard	LOT	10	8	80	7	70	8	80	7	70
40	b/w Terrace and Bridge St/J.P.s Seafood Restaurant	LOT	25	20	80	25	100	25	100	24	96
41	b/w Bridge & Terrace Streets/Lobster House	LOT	14	7	50	13	93	13	93	12	86
42	b/w Bridge & Terrace Streets/Seafood Restaurant	LOT	30	20	67	30	100	23	77	30	100
43	b/w Bridge & Terrace Streets/Marina/Boat Yard	LOT	35	26	74	21	60	26	74	21	60
	Total Parking on City Island		**1,672**	**1046**	**63**	**1347**	**81**	**1239**	**74**	**1328**	**79**
	Pelham Park Area										
44	NYC Police Department / Firing Range	LOT	54	50	93	77	143	45	83	44	81
45	Orchard Beach Parking Lot	LOT	6000	2646	44	2205	37	3276	55	2457	41
46	Orchard Beach (NYPD/DPR Employees Only)	LOT	70	210	300	189	270	200	286	179	256
47	City Island Road /Turtle Cove Golf / Baseball Field	LOT	98	103	105	92	94	101	103	87	89
48	North Shore & City Island Roads / Riding Stable	LOT	20	14	70	9	45	16	80	12	60
49	Pelham Park Golf Clubs	LOT	400	159	40	130	33	177	44	113	28
	Total Parking in the Pelham Park		**6,642**	**3182**	**48**	**2702**	**41**	**3815**	**58**	**2892**	**44**

TABLE 7-4c
Off-Street Parking Facilities - Marinas/Boatyards (Location, Capacity, and Utilization Rates)

No.	LOCATION City Island Avenue	Boats/ LOT	Capacity (#)	Utilization Rate					
				Weekdays					
				AM Peak		MD Peak		PM Peak	
				(#)	(%)	(#)	(%)	(#)	(%)
1	Corner of Belden Street	LOT	33	30	91	30	91	30	91
2	b/w Belden & Rochelle Sreets	LOT	106	76	72	76	72	76	72
3	b/w Pilot & Reynolds Streets	LOT	70	65	93	65	93	65	93
4	b/w Reynolds & Pell Streets	LOT	195	195	100	195	100	195	100
5	b/w Pell & Earley Streets	LOT	270	256	95	256	95	256	95
6	b/w Winters & Centre Streets	LOT	75	75	100	75	100	75	100
7	b/w Fordham & Tier Streets	LOT	230	240	104	240	104	240	104
8	b/w Ditmars & Kirby Streets	LOT	20	20	100	20	100	20	100
9	b/w Ditmars & Kirby Streets	LOT	50	50	100	50	100	50	100
10	b/w Ditmars & Kirby Streets	LOT	22	20	91	20	91	20	91
11	b/w Kirby & Bowne Streets	LOT	100	90	90	90	90	90	90
12	Corner of Beach Street	LOT	55	55	100	55	100	55	100
13	b/w Beach & Cross Streets	LOT	65	60	92	60	92	60	92
14	Corner of Cross Street	LOT	70	60	86	60	86	60	86
15	b/w City Island Bridge & Bridge Street	LOT	50	40	80	40	80	40	80
	Total Parking for the Boats		**1,411**	**1332**	**94**	**1332**	**94**	**1332**	**94**

No.	LOCATION City Island Avenue	Boats/ LOT	Capacity (#)	Utilization Rate							
				Saturday				Sunday			
				MD Peak		PM Peak		MD Peak		PM Peak	
				(#)	(%)	(#)	(%)	(#)	(%)	(#)	(%)
1	Corner of Belden Street	LOT	33	30	91	30	91	30	91	30	91
2	b/w Belden & Rochelle Sreets	LOT	106	76	72	76	72	76	72	76	72
3	b/w Pilot & Reynolds Streets	LOT	70	65	93	65	93	65	93	65	93
4	b/w Reynolds & Pell Streets	LOT	195	195	100	195	100	195	100	195	100
5	b/w Pell & Earley Streets	LOT	270	256	95	256	95	256	95	256	95
6	b/w Winters & Centre Streets	LOT	75	75	100	75	100	75	100	75	100
7	b/w Fordham & Tier Streets	LOT	230	240	104	240	104	240	104	240	104
8	b/w Ditmars & Kirby Streets	LOT	20	20	100	20	100	20	100	20	100
9	b/w Ditmars & Kirby Streets	LOT	50	50	100	50	100	50	100	50	100
10	b/w Ditmars & Kirby Streets	LOT	22	20	91	20	91	20	91	20	91
11	b/w Kirby & Bowne Streets	LOT	100	90	90	90	90	90	90	90	90
12	Corner of Beach Street	LOT	55	55	100	55	100	55	100	55	100
13	b/w Beach & Cross Streets	LOT	65	60	92	60	92	60	92	60	92
14	Corner of Cross Street	LOT	70	60	86	60	86	60	86	60	86
15	b/w City Island Bridge & Bridge Street	LOT	50	40	80	40	80	40	80	40	80
	Total Parking for the Boats		**1,411**	**1332**	**94**	**1332**	**94**	**1332**	**94**	**1332**	**94**

A few parking lots on City Island were filled to capacity during the midday and evening peak hours, while others were less than 50% occupied during the same peak hours. The City Island boatyards are about 94% occupied during weekday and weekend peak periods (see Table 7-4c).

Overall, most of the parking lots are empty or closed in the morning peak hours because most restaurants close late at night and open late in the morning (11 AM or even later). During the summer, the Orchard Beach parking lot is only 50% utilized during the midday peak hours; however, on special events or celebrations the lots are filled to capacity.

7.4 Future Parking

Based on the current high demand for parking during the summer it is anticipated that future demands will be increased due to a growth in population and vehicle ownership, new residential developments, and other land use changes that will generate additional vehicular trips. The higher demands for on-street and off-street parking are expected in areas closer to recreational facilities such as restaurants, marinas, and yacht clubs, new residential homes, as well as existing commercial establishments along City Island Avenue.

The parking analysis for the future condition in the study area indicates that approximately 9,441 parking spaces will be available in the study area – 11.3% (1,068 spaces) for on-street, and 88.7% (8,373 spaces) for off-street parking.

On-Street Parking

Demand for on-street parking in the future is expected to be generally higher in areas with high concentration of recreational establishments (restaurants, marinas, and yacht clubs) and new residential developments and along City Island Avenue where utilization rates are projected to be at or above the legal capacities. Tables 7-5, 7-6, and 7-7 show the future on-street parking supply, demand and utilization rate for the weekday and weekend peak hours in the study area.

The future parking analysis shows that on-street parking utilization rates would remain higher on City Island Avenue than on the other local streets. Parking utilization rates on both sides of City Island Avenue indicates that 72% of all available parking space are expected to be occupied during the weekday AM peak hours, 73% during the midday peak hour, and 87% during the PM

peak hour (see Table 7-5a). For Saturday, the utilization rate will be 80% during the midday peak hour and 92% during the evening peak hour.

The utilization rates are projected to be highest on Sunday with 89% during the midday peak hour and 95% during the evening peak hour (see Table 7-5b). On-street parking along City Island Avenue at the sections between Pilot and Belden Streets, Ditmars and Fordham Streets, and Bridge and Beach Streets is expected to be constantly utilized or at capacity due to high recreational or residential activities. The utilization rates for local side streets are expected to be 67%, 56%, and 62% during the AM, midday and PM peak hours for weekdays while on Saturday and Sunday midday and evening peak hours it will be 79%, 90%, 85% and 88% (see Tables 7-a and 7-6b), respectively.

The utilization rates for local streets, parallel to City Island Avenue (Minnieford, King, William, and Hunter Avenues), are expected to be 73%, 70% and 87% during the AM, midday, and PM peak hours for the weekdays, and 69%, 74%, 80% and 86% during the Saturday and Sunday (midday and evening) peak hours (see Tables 7-7a and 7-7b).

The future on-street parking analysis indicates that some local streets are expected to be utilized at or above capacity while others will be 50% or less during the selected peak hours.

Off-Street Parking

The future condition analyzed 49 off-street parking facilities in the study area with a total capacity of 8,373 parking spaces. Additionally, 15 boatyards located all on City Island with capacity of 1,411 spaces are evaluated for the future condition. Off-street parking on the island is expected to enlarge by adding 134 additional parking spaces for residents upon construction of 44 two-family housing. The first construction site, former boatyard and marina (The Royal Marina) located between Cross and Beach Streets, will include 107 accessory parking spaces, of which 68 spaces are to be assigned to new development and the remaining 39 spaces to the private slips. The second proposed construction site, located at the southern tip of Fordham Street/Fordham Place will generate 66 additional parking spaces to the island (assumed three parking spaces per one two-family house).

TABLE 7-5a
City Island Avenue, Legal Capacity and Utilitization Rates

Roadway City Island Avenue	Legal Capacity (#)	Utilization Rate Weekdays					
		AM Peak		MD Peak		PM Peak	
		(#)	(%)	(#)	(%)	(#)	(%)
1. b/w Bridge & Cross Streets (East Side)	15	7	47	8	53	11	73
2. b/w Bridge & Beach Streets (West Side)	18	16	89	18	100	19	106
3. b/w Cross & Beach Streets (East Side)	None	None	None	None	None	None	None
4. b/w Beach & Bowne Streets (East Side)	15	11	73	14	93	13	87
4A. b/w Beach & Bowne Streets (West Side)	10	8	80	11	110	7	70
5. b/w Bowne & Ditmars Streets (East Side)	12	11	92	12	100	13	108
5A b/w Bowne & Ditmars Streets (West Side)	18	12	67	13	72	17	94
6. b/w Ditmars & Reville Streets (East Side)	8	5	63	2	25	6	75
7. b/w Ditmars & Reville Streets (West Side)	6	5	83	5	83	6	100
8. b/w Reville & Tier Streets (East Side)	6	4	67	6	100	5	83
9. b/w Tier & Bay Streets (West Side)	5	5	100	5	100	4	80
10. Bay & Fordham Streets (West Side)	9	7	78	8	89	5	56
11. b/w Bay & Fordham Streets (East Side)	6	5	83	6	100	6	100
12. b/w Fordham & Hawkins Streets (West Side)	7	6	86	7	100	6	86
12A. b/w Fordham & Hawkins Streets (East Side)	12	9	75	11	92	12	100
13. b/w Hawkins & Carrol Streets (West Side)	9	7	78	9	100	9	100
13A. b/w Hawkins & Caroll Streets (East Side)	8	6	75	7	88	8	100
14. b/w Caroll & Schofield Streets (West Side)	8	6	75	6	75	8	100
14A. b/w Caroll & Schofield Street (East Side)	10	8	80	5	50	8	80
15. b/w Schofield & Centre Street (West Side)	8	7	88	5	63	8	100
15A. b/w Schofield & Centre Street (East Side)	8	None	None	None	None	6	75
16. b/w Centre & Winters Streets (West Side)	5	4	80	5	100	5	100
17. b/w Winters & Early Street (West Side)	6	5	83	5	83	6	100
18. b/w Early Street & Pell Place (West Side)	8	7	88	5	63	8	100
19. b/w Pell Place & Reynold Street (West Side)	4	None	None	2	50	None	None
20. b/w Reynold & Pilot Streets (West Side)	6	5	83	4	67	6	100
21. b/w Pilot & Marine Streets (West Side)	10	7	70	5	50	9	90
21A. b/w Pilot & Marine Streets (East Side)	10	7	70	5	50	8	80
22. b/w Marine & Buckley Streets (West Side)	12	7	58	4	33	8	67
23. b/w Buckley & Horton Streets (West Side)	10	6	60	6	60	8	80
24. b/w Marine & Horton Street (East Side)	7	6	86	5	71	7	100
25. b/w Horton & Rochelle Street (West Side)	4	2	50	1	25	3	75
25A. b/w Horton & Rochelle Streets (East Side)	2	1	50	2	100	1	50
26. b/w Rochelle & Belden Streets (East Side)	None	None	None	None	None	None	None
TOTAL	**282**	**202**	**72**	**207**	**73**	**246**	**87**

TABLE 7-5b
City Island Avenue, Legal Capacity and Utilitization Rates

Roadway City Island Avenue	Legal Capacity (#)	Utilization Rate							
		Saturday				Sunday			
		MD Peak		PM Peak		MD Peak		PM Peak	
		(#)	(%)	(#)	(%)	(#)	(%)	(#)	(%)
1. b/w Bridge & Cross Streets (East Side)	15	9	60	9	60	11	73	15	100
2. b/w Bridge & Beach Streets (West Side)	18	17	94	19	106	16	89	17	94
3. b/w Cross & Beach Streets (East Side)	None	None	None	None	None	None	None	None	None
4. b/w Beach & Bowne Streets (East Side)	15	13	87	14	93	14	93	15	100
4A. b/w Beach & Bowne Streets (West Side)	10	9	90	9	90	11	110	9	90
5. b/w Bowne & Ditmars Streets (East SIDE)	12	12	100	12	100	13	108	12	100
5A b/w Bowne & Ditmars Streets (West Side)	18	15	83	16	89	17	94	16	89
6. b/w Ditmars & Reville Streets (East Side)	8	5	63	6	75	7	88	7	88
7. b/w Ditmars & Tier Streets (West West)	6	4	67	6	100	5	83	6	100
8. b/w Reville & Tier Streets (East Side)	6	5	83	6	100	5	83	6	100
9. b/w Tier & Bay Streets (West Side)	5	5	100	9	180	5	100	5	100
10. Bay & Fordham Streets (West Side)	9	7	78	5	56	8	89	7	78
11. b/w Tier & Fordham Streets (East Side)	6	6	100	6	100	6	100	6	100
12. b/w Fordham & Hawkins Streets (West Side)	7	7	100	6	86	7	100	7	100
12A. b/w Fordham & Hawkins Streets (East Side)	12	12	100	12	100	13	108	12	100
13. b/w Hawkins & Carrol Streets (West Side)	9	8	89	9	100	9	100	9	100
13A. b/w Hawkins & Caroll Streets (East Side)	8	6	75	8	100	7	88	8	100
14. b/w Caroll & Schofield Streets (West Side)	8	7	88	7	88	7	88	8	100
14A. b/w Caroll & Schofield Street (East Side)	10	7	70	11	110	8	80	9	90
15. b/w Schofield & Centre Street (West Side)	8	6	75	8	100	6	75	8	100
15A. b/w Schofield & Pilot Street (East Side)	5	4	80	3	60	4	80	3	60
16. b/w Centre & Winters Streets (West Side)	5	4	80	5	100	4	80	5	100
17. b/w Winters & Early Street (West Side)	6	5	83	5	83	6	100	6	100
18. b/w Early Street & Pell Place (West Side)	8	7	88	7	88	6	75	8	100
19. b/w Pell Place & Reynold Street (West Side)	4	3	75	None	None	3	75	None	None
20. b/w Reynold & Pilot Streets (West Side)	6	5	83	6	100	5	83	6	100
21. b/w Pilot & Marine Streets (West Side)	10	7	70	9	90	8	80	11	110
21A. b/w Pilot & Marine Streets (East Side)	10	6	60	8	80	7	70	9	90
22. b/w Marine & Buckley Streets (West Side)	12	8	67	13	108	11	92	12	100
23. b/w Buckley & Horton Streets (West Side)	10	5	50	11	110	8	80	9	90
24. b/w Marine & Horton Street (East Side)	7	5	71	7	100	6	86	7	100
25. b/w Horton & Rochelle Street (West Side)	4	2	50	4	100	4	100	4	100
25A. b/w Horton & Rochelle Streets (East Side)	2	1	50	2	100	2	100	2	100
26. b/w Rochelle & Belden Streets (East Side)	None	None	None	None	None	None	None	None	None
TOTAL	**282**	**222**	**80**	**258**	**92**	**249**	**89**	**264**	**95**

None - Simbol for parking regulation code: No Parking Available / No Parked Cars

TABLE 7-6a
On-Street Parking Facilities, Legal Capacity and Utilitization Rates

Roadway **Cross Street**	Legal Capacity (#)	Utilization Rate					
		Weekdays					
		AM Peak		MD Peak		PM Peak	
	North/South	(#)	(%)	(#)	(%)	(#)	(%)
1. Bridge Street (East from City Island Avenue)	None	None	None	None	None	None	None
2. Cross Street (East from City Island Avenue)	None	None	None	None	None	None	None
3. Beach Street (East from City Island Avenue)	None / 9	7	78	4	44	9	100
4. Bowne Street (West from City Island Avenue)	None	None	None	None	None	None	None
4A. Bowne Street (East from City Island Avenue)	None / 13	11	85	11	85	13	100
5. Ditmars Street (West from City Island Avenue)	9 / 9	4	22	6	33	5	28
5A. Ditmars Street (East from City Island Avenue)	None / 16	17	106	13	81	15	94
6. Tier Street (West from City Island Avenue)	9 / 9	19	106	19	106	19	106
6A. Tier Street (East from City Island Avenue)	None / 20	16	80	12	60	13	65
7. Reville Street (East from City Island Avenue)	None / 23	12	52	16	70	13	57
8. Bay Street (West from City Island Avenue)	12 / None	13	108	5	42	6	50
9. Fordham Street (West from City Island Avenue)	23 / 23	27	59	17	37	18	39
9A. Fordham Street (East from City Island Avenue)	12 / 8	19	95	19	95	19	95
10. Hawkins Street (West from City Island Avenue)	None	None	None	None	None	None	None
10A. Hawkins Street (East from City Island Avenue)	9 / None	9	100	7	78	9	100
11. Caroll Street (West from City Island Avenue)	18 / None	13	72	11	61	13	72
11A. Caroll Street (East from City Island Avenue)	None / 13	12	92	3	23	11	85
12. Shofield Street (West from City Island Avenue)	None / 22	17	77	13	59	12	55
12A. Shofield Street (East from City Island Avenue)	7 / 12	15	79	14	74	18	95
13. Centre Street (West from City Island Avenue)	18 / 13	17	55	22	71	17	55
14. Winters Street (West from City Island Avenue)	26 / 26	40	77	29	56	37	71
15. Earley Street (West from City Island Avenue)	30 / 20	27	54	21	42	26	52
16. Pell Place (West from City Island Avenue)	27 / 30	32	56	27	47	25	44
17. Reynold Street (West from City Island Avenue)	25 / 32	18	32	23	40	32	56
18. Pilot Street (West from City Island Avenue)	None / 28	18	64	16	57	13	46
18A. Pilot Street (East from City Island Avenue)	None	None	None	None	None	None	None
19. Marine Street (West from City Island Avenue)	None / 28	18	64	19	68	13	46
19A. Marine Street (East from City Island Avenue)	None / 7	7	100	3	43	7	100
20. Buckley Street (West from City Island Avenue)	None / 18	15	83	11	61	13	72
21. Horton Street (West from City Island Avenue)	None	None	None	None	None	None	None
21A. Horton Street (East from City Island Avenue)	None	None	None	None	None	None	None
22. Rochelle Street (West from City Island Avenue)	None	None	None	None	None	None	None
22A. Rochelle Street (East from City Island Avenue)	None	None	None	None	None	None	None
23. Belden Street (East from City Island Avenue)	None	None	None	None	None	None	None
TOTAL	**604**	**403**	**67**	**341**	**56**	**376**	**62**

TABLE 7-6b
On-Street Parking Facilities, Legal Capacity and Utilitization Rates

Roadway Cross Street	Legal Capacity (#)	Utilization Rate							
		Saturday				Sunday			
		MD Peak		PM Peak		MD Peak		PM Peak	
		(#)	(%)	(#)	(%)	(#)	(%)	(#)	(%)
1. Bridge Street (East from City Island Avenue)	None	None	None	None	None	None	None	None	None
2. Cross Street (East from City Island Avenue)	None	None	None	None	None	None	None	None	None
3. Beach Street (East from City Island Avenue)	None / 9	5	56	8	89	8	89	9	100
4. Bowne Street (West from City Island Avenue)	None / None	None	None	None	None	None	None	None	None
4A. Bowne Street (East from City Island Avenue)	None / 13	12	92	13	100	13	100	12	92
5. Ditmars Street (West from City Island Avenue)	9 / 9	5	28	13	72	13	72	15	83
5A. Ditmars Street (East from City Island Avenue)	None / 16	14	88	15	94	14	88	16	100
6. Tier Street (West from City Island Avenue)	9 / 9	16	89	16	89	18	100	18	100
6A. Tier Street (East from City Island Avenue)	None / 20	15	75	17	85	15	75	20	100
7. Reville Street (East from City Island Avenue)	None / 23	19	83	20	87	20	87	22	96
8. Bay Street (West from City Island Avenue)	12 / None	7	58	12	100	8	67	11	92
9. Fordham Street (West from City Island Avenue)	23 / 23	27	59	44	96	55	120	36	78
9A. Fordham Street (East from City Island Avenue)	12 / 8	18	90	20	100	19	95	19	95
10. Hawkins Street (West from City Island Avenue)	None	None	None	None	None	None	None	None	None
10A. Hawkins Street (East from City Island Avenue)	9 / None	7	78	9	100	8	89	9	100
11. Caroll Street (West from City Island Avenue)	18 / None	19	106	18	100	17	94	17	94
11A. Caroll Street (East from City Island Avenue)	None / 13	13	100	12	92	9	69	11	85
12. Shofield Street (West from City Island Avenue)	None / 22	19	86	22	100	20	91	21	95
12A. Shofield Street (East from City Island Avenue)	7 / 12	15	79	18	95	16	84	20	105
13. Centre Street (West from City Island Avenue)	18 / 13	22	71	28	90	26	84	29	94
14. Winters Street (West from City Island Avenue)	26 / 26	36	69	46	88	46	88	51	98
15. Earley Street (West from City Island Avenue)	30 / 20	44	88	26	52	48	96	26	52
16. Pell Place (West from City Island Avenue)	27 / 30	45	79	56	98	48	84	43	75
17. Reynold Street (West from City Island Avenue)	25 / 32	49	86	58	102	34	60	51	89
18. Pilot Street (West from City Island Avenue)	None / 28	26	93	23	82	18	64	26	93
18A. Pilot Street (East from City Island Avenue)	None	None	None	None	None	None	None	None	None
19. Marine Street (West from City Island Avenue)	None / 28	24	86	25	89	16	57	26	93
19A. Marine Street (East from City Island Avenue)	None / 7	5	71	7	100	6	86	7	100
20. Buckley Street (West from City Island Avenue)	None / 18	15	83	18	100	16	89	18	100
21. Horton Street (West from City Island Avenue)	None	None	None	None	None	None	None	None	None
21A. Horton Street (East from City Island Avenue)	None	None	None	None	None	None	None	None	None
22. Rochelle Street (West from City Island Avenue)	None	None	None	None	None	None	None	None	None
22A. Rochelle Street (East from City Island Avenue)	None	None	None	None	None	None	None	None	None
23. Belden Street (East from City Island Avenue)	None	None	None	None	None	None	None	None	None
TOTAL	**604**	**477**	**79**	**544**	**90**	**511**	**85**	**533**	**88**

None - Simbol for parking regulation code: No Parking Available

TABLE 7-7a
King, Minnieford, Hunter, William Avenues
Parking Facilities, Legal Capacity and Utilitization Rates

Roadway Side Street/Avenue	Legal Capacity	Utilization Rate Weekdays AM Peak		MD Peak		PM Peak	
MINNIEFORD AVENUE:	(#)	(#)	(%)	(#)	(%)	(#)	(%)
1. b/w Terrace & Sutherland Sts. (East Side)	15	7	47	8	53	11	73
2. b/w Terrace & Cross Sts. (West Side)	None	None	None	None	None	None	None
3. b/w Sutherland & Kilroe Sts. (East Side)	18	16	89	18	100	19	106
4. b/w Kilroe & Cross Sts. (East Side)	15	11	73	14	93	13	87
5. b/w Cross & Beach Sts. (West Side)	None	None	None	None	None	None	None
5A. b/w Cross & Beach Sts. (East Side)	12	11	92	12	100	13	108
6. b/w Beach & Bowne Sts. (West Side)	None	None	None	None	None	None	None
6A. b/w Beach & Bowne Sts. (East Side)	8	5	63	2	25	6	75
7. b/w Bowne & Ditmars Sts. (West Side)	None	None	None	None	None	None	None
7A. b/w Bowne & Ditmars Sts. (East Side)	6	4	67	6	100	5	83
KING AVENUE:							
1. b/w Terrace & Sutherland Sts. (West Side)	9	7	78	8	89	5	56
1A. b/w Terrace & Sutherland Sts. (East Side)	None	None	None	None	None	None	None
2. b/w Sutherland & Kilroe Sts. (East Side)	None	None	None	None	None	None	None
2A. b/w Sutherland & Kilroe Sts. (West Side)	12	9	75	11	92	12	100
3. b/w Beach & Bowne Sts. (East Side)	None	None	None	None	None	None	None
3A. b/w Beach & Bowne Sts. (West Side)	8	6	75	7	88	8	100
4. b/w Bowne & Kirby Sts. (East Side)	None	None	None	None	None	None	None
4A. b/w Bowne & Kirby Sts. (West Side)	10	8	80	5	50	8	80
5. b/w Kirby & Ditmars Sts. (East Side)	None	None	None	None	None	None	None
5. b/w Kirby & Ditmars Sts. (West Side)	8	7	88	5	63	8	100
6. b/w Ditmars & Reville Sts. (East/West Side)	None	None	None	None	None	None	None
7. b/w Reville & Tier Sts. (East/West Side)	None	None	None	None	None	None	None
8. b/w Tier & Fordham Sts. (East/West Side)	None	None	None	None	None	None	None
WILLIAM AVENUE:							
1. b/w Ditmars & Tier Sts. (East Side)	Closed	Private		Driway			
1A. b/w Ditmars & Tier Sts. (West Side)	Closed	Private		Driway			
2. b/w Tier & Bay Sts. (East Side)	10	7	70	5	50	8	80
2A. b/w Tier & Bay Sts. (West Side)	12	7	58	4	33	8	67
3. b/w Bay & Fordham Sts. (East Side)	10	6	60	6	60	8	80
3A. b/w Bay & Fordham Sts. (West Side)	7	6	86	5	71	7	100
4. b/w Fordham & Hawkins Sts. (East Side)	4	2	50	1	25	3	75
4A. b/w Fordham & Hawkins Sts. (West Side)	2	1	50	2	100	1	50
5. b/w Caroll & Schofield Sts. (East Side)	None	None	None	None	None	None	None
5A. b/w Caroll & Schofield Sts. (West Side)	None	None	None	None	None	None	None
6. b/w Schofield & Centre Sts. (East Side)	None	None	None	None	None	None	None
6A. b/w Schofield & Centre Sts. (West Side)	None	None	None	None	None	None	None
HUNTER AVENUE:							
1. b/w Bowne & Ditmars Sts. (East Side)	6	5	83	4	67	6	100
1A. b/w Bowne & Ditmars Sts. (West Side)	10	7	70	5	50	9	90
TOTAL:	**182**	**132**	**73**	**128**	**70**	**158**	**87**

TABLE 7-7b
King, Minnieford, Hunter, and William Avenues
Parking Facilities, Legal Capacity and Utilitization Rates

Roadway Side Street/Avenue	Legal Capacity	Utilization Rate							
		Saturday				Sunday			
		MD Peak		PM Peak		MD Peak		PM Peak	
MINNIEFORD AVENUE:	(#)	(#)	(%)	(#)	(%)	(#)	(%)	(#)	(%)
1. b/w Terrace & Sutherland Sts.(East Side)	15	7	47	9	60	12	80	13	87
2. b/w Terrace & Cross Sts. (West Side)	None	None	None	None	None	None	None	None	None
3. b/w Sutherland & Kilroe (East Side)	18	16	89	18	100	16	89	18	100
4. b/w Kilroe & Cross Sts. (East Side)	15	12	80	14	93	12	87	15	100
5. b/w Cross & Beach Sts. (West Side)	None	None	None	None	None	None	None	None	None
5A. b/w Cross & Beach Sts. (East Side)	12	11	92	12	100	12	100	13	108
6. b/w Beach & Bowne Sts. (West Side)	None	None	None	None	None	None	None	None	None
6A. b/w Beach & Bowne Sts.(East Side)	8	5	63	6	75	6	75	7	88
7. b/w Bowne & Ditmars Sts. (West Side)	None	None	None	None	None	None	None	None	None
7A. b/w Bowne & Ditmars Sts. (East Side)	6	5	83	6	100	5	83	6	100
KING AVENUE:									
1. b/w Terrace & Sutherland Sts. (West Side)	9	6	67	7	78	6	67	8	89
1A. b/w Terrace & Sutherland Sts. (East Side)	None	None	None	None	None	None	None	None	None
2. b/w Sutherland & Kilroe Sts. (East Side)	None	None	None	None	None	None	None	None	None
2A. b/w Sutherland & Kilroe Sts. (West Side)	12	8	67	9	75	11	92	9	75
3. b/w Beach & Bowne Sts. (East Side)	None	None	None	None	None	None	None	None	None
3A. b/w Beach & Bowne Sts. (West Side)	8	6	75	7	88	6	75	7	88
4. b/w Bowne & Kirby Sts. (East Side)	None	None	None	None	None	None	None	None	None
4A. b/w Bowne & Ditmars Sts. (West Side)	10	7	70	8	80	6	60	8	80
5. b/w Kirby & Ditmars Sts. (East Side)	None	None	None	None	None	None	None	None	None
6. b/w Ditmars & Reville Sts. (West Side)	8	5	63	6	75	7	88	7	88
6A. b/w Ditmars & Fordham Sts. (East Side)	None	None	None	None	None	None	None	None	None
7. b/w Reville & Tier Sts. (West Side)	None	None	None	None	None	None	None	None	None
8. b/w Tier & Fordham Sts. (West Side)	None	None	None	None	None	None	None	None	None
WILLIAM AVENUE:									
1. b/w Ditmars & Tier Sts. (East Side)	Closed	Private Drive							
1A. b/w Ditmars & Tier Sts. (West Side)	Closed	Private Drive							
2. b/w Tier & Bay Sts. (East Side)	10	7	70	5	50	8	80	7	70
2A. b/w Tier & Bay Sts. (West Side)	12	7	58	4	33	8	67	12	100
3. b/w Bay & Fordham Sts. (East Side)	10	6	60	6	60	8	80	7	70
3A. b/w Bay & Fordham Sts. (West Side)	7	6	86	5	71	7	100	5	71
4. b/w Fordham & Hawkins Sts. (East Side)	4	2	50	1	25	3	75	1	25
4A. b/w Fordham & Hawkins Sts. (West Side)	2	1	50	2	100	1	50	2	100
5. b/w Caroll & Schofield Sts. (East Side)	None	None	None	None	None	None	None	None	None
5A. b/w Caroll & Schofield Sts. (West Side)	None	None	None	None	None	None	None	None	None
6. b/w Schofield & Centre Sts. (East Side)	None	None	None	None	None	None	None	None	None
6A. b/w Schofield & Centre Sts. (West Side)	None	None	None	None	None	None	None	None	None
HUNTER AVENUE:									
1. b/w Bowne & Ditmars Sts. (East Side)	5	1	20	2	40	2	40	2	40
1A. b/w Bowne & Ditmars Sts. (West Side)	10	6	60	7	70	8	80	9	90
TOTAL:	**181**	**124**	**69**	**134**	**74**	**144**	**80**	**156**	**86**

None - Simbol for parking regulation code: No Parking Available

The City Island parking lots are projected to be occupied 21%, 61%, and 82% during each of the weekday peak period, while the parking lots in the Pelham Bay Park area 3%, 8% and 11% will be occupied during the same analyzed peak hours (see Table 7-8a).

During the Saturday and Sunday midday and evening peak hours parking lots will be 65%, 83%, 77%, and 81% occupied on City Island and 50%, 43%, 60%, and 46% occupied in Pelham Bay Park (see Table 7-8b). A few parking lots on City Island are expected to be filled to capacity during the midday and evening peak hours, while others would be less than 50% occupied during the same peak hours. The City Island boatyards are expected to be 95% occupied during weekday and weekend peak periods (see Table 7-8c).

TABLE 7-8a
Off-Street Parking Facilities (Location, Legal Capacity, and Utilization Rates)

No.	LOCATION City Island Avenue	Parking Garage / LOT	Legal Capacity (#)	Utilization Rate Weekdays					
				AM Peak		MD Peak		PM Peak	
				(#)	(%)	(#)	(%)	(#)	(%)
1	bottom tip of City Island/Sea Food Restaurant	LOT	125	15	12	99	79	105	84
2	b/w Belden Point & Street/Johnny's Restaurant	LOT	140	7	5	45	32	130	93
3	b/w Belden & Rochelle/Sea Food Restaurant	LOT	50	7	14	37	74	42	84
4	b/w Belden & Rochelle Streets/Sea Food Restaurant	LOT	23	4	17	34	148	44	191
5	b/w Belden & Rochelle Streets/Morris Yacht Club	LOT	25	4	16	34	136	44	176
6	b/w Belden & Rochelle Streets/Lobster House	LOT	20	1	5	1	5	18	90
7	b/w Rochelle & Belden Point/Neptune In Restaurant	LOT	56	0	0	21	38	25	47
8	b/w Rochelle & Horton/Marina/Boat Yard	LOT	10	4	40	7	70	6	60
9	b/w Rochelle & Horton Streets/Sammy's Restaurant	LOT	50	2	4	30	60	44	88
10	b/w Rochelle & Horton Streets/Tito Puente's Restaurant	LOT	30	2	7	11	67	29	97
11	b/w Horton & Buckley Streets/Sammy's Restaurant	LOT	40	2	5	28	70	30	75
12	b/w Buckley & Marine Streets/Trattoria Restaurant	LOT	25	16	64	19	76	27	108
13	b/w Marine & Pilot/Marina/Boat Yard	LOT	40	11	28	18	45	15	38
14	b/w Pilot & Reynolds Streets/LIDO Sea Food Restaurant	LOT	30	0	0	32	107	19	63
15	b/w Early and Pell Streets/UK Sail workers	LOT	10	8	80	8	80	7	70
16	b/w Winters & Centre Streets/Auto Repair Shop	LOT	10	4	40	6	60	13	130
17	b/w Winters & Centre Streets/Chase Bank	LOT	10	3	30	7	70	8	80
18	b/w Pilot & Scholfield/Marina/Boat Yard	LOT	10	6	60	11	110	8	80
19	b/w Pilot & Scholfield/Marina/Boat Yard	LOT	150	79	53	126	84	105	70
20	b/w Pilot & Scholfield/Marina/Boat Yard	LOT	45	12	27	19	42	15	33
21	b/w Schofield & Caroll Streets/Residential	LOT	16	4	25	9	56	14	88
22	b/w Deep Water & Banta La/Residential	LOT	30	11	37	16	53	26	87
23	b/w Banta La & Fordham Streets/Residential	LOT	30	8	28	14	47	23	77
24	b/w Fordham Place & Wineward Lane/Marina/Boat Yard	LOT	20	7	35	13	65	11	55
25	b/w Tier & Bay Streets/Residential	LOT	30	8	28	19	63	25	83
26	b/w Tier & Reville Streets/Crab Shanty Restaurant	LOT	18	5	28	16	89	20	111
27	b/w Reville & Ditmars Streets/Artie's Restaurant	LOT	20	5	25	13	65	13	65
28	b/w Ditmars & Bowne Streets/Sunoco Gas Station	LOT	10	9	90	9	90	9	90
29	b/w Bowne & Beach Streets/Sea Food City	LOT	180	8	4	62	34	135	75
30	b/w Bowne & Beach/Residential	LOT	10	3	30	5	50	8	80
31	Corner of Beach Street/Private Construction Site	LOT	10	5	50	7	70	15	150
32	b/w Beach & Cross Streets/Burcks Hardware Store	LOT	10	1	10	5	50	9	90
33	b/w Beach & Cross Streets/Residential	LOT	103	16	16	55	53	85	83
34	Corner of Cross Street/American Legion	LOT	25	0	0	5	20	8	32
35	b/w Cross & Kilroe Streets/Marina/Boat Yard	LOT	10	6	60	8	80	7	70
36	b/w Cross & Bridge Streets/Sea Shore Restaurant	LOT	85	4	5	47	55	86	101
37	b/w Cross & Bridge Streets/Harbor Restaurant	LOT	80	26	33	44	55	59	74
38	b/w Kilroe & Bridge Streets/Seaview Restaurant	LOT	25	3	12	23	92	23	92
39	b/w Bridge & Sutherland Streets/Marina/Boat Yard	LOT	10	7	70	11	110	9	90
40	b/w Terrace and Bridge St/J.P.s Seafood Restaurant	LOT	25	3	12	21	84	25	100
41	b/w Bridge & Terrace Streets/Lobster House	LOT	14	7	50	9	64	14	100
42	b/w Bridge & Terrace Streets/Seafood Restaurant	LOT	30	4	13	19	63	24	80
43	b/w Bridge & Terrace Streets/Marina/Boat Yard	LOT	35	17	49	27	77	22	63
44	Corner of Fordham Street/Fordham Place/Residential	LOT	66	20	30	34	52	56	85
	Total Parking on City Island		**1,791**	**374**	**21**	**1084**	**61**	**1460**	**82**
	Pelham Park Area								
44	NYC Police Department / Firing Range	LOT	54	15	28	20	37	37	69
45	Orchard Beach Parking Lot	LOT	6000	66	1	221	4	370	6
46	Orchard Beach (NYPD/DPR Employees Only)	LOT	70	44	63	100	143	95	136
47	City Island Road /Turtle Cove Golf / Baseball Field	LOT	98	14	14	59	60	51	52
48	North Shore & City Island Roads / Riding Stable	LOT	20	1	4	2	8	4	20
49	Pelham Park Golf Clubs	LOT	400	61	15	111	28	105	26
	Total Parking in the Pelham Park		**6,642**	**201**	**3**	**513**	**8**	**662**	**10**

TABLE 7-8b
Off-Street Parking Facilities (Location, Legal Capacity, and Utilization Rates)

No.	LOCATION City Island Avenue	Parking Garage / LOT	Legal Capacity (#)	Utilization Rate							
				Saturday				Sunday			
				MD Peak		PM Peak		MD Peak		PM Peak	
				(#)	(%)	(#)	(%)	(#)	(%)	(#)	(%)
1	Bottom tip of City Island/Sea Food Restaurant	LOT	125	92	74	126	101	99	79	131	105
2	b/w Belden Point & Street/Johnny's Restaurant	LOT	140	89	64	162	116	130	93	158	113
3	b/w Belden & Rochelle/Sea Food Restaurant	LOT	50	40	80	52	104	42	84	49	98
4	b/w Belden & Rochelle Streets/Sea Food Restaurant	LOT	23	29	126	44	191	34	148	42	183
5	b/w Belden & Rochelle Streets/Morris Yacht Club	LOT	25	30	120	42	168	28	112	44	176
6	b/w Belden & Rochelle Streets/Lobster House	LOT	20	15	80	22	110	18	90	22	110
7	b/w Rochelle & Belden Point/Neptune In Restaurant	LOT	56	9	16	26	46	24	43	25	45
8	b/w Rochelle & Horton/Marina/Boat Yard	LOT	10	7	70	6	60	7	70	6	60
9	b/w Rochelle & Horton Streets/Sammy's Restaurant	LOT	50	41	82	54	108	44	88	51	102
10	b/w Rochelle & Horton Streets/Tito Puente's Restaurant	LOT	30	22	73	34	113	27	90	32	107
11	b/w Horton & Buckley Streets/Sammy's Restaurant	LOT	40	16	40	34	85	30	75	36	90
12	b/w Buckley & Marine Streets/Trattoria Restaurant	LOT	25	9	36	16	64	22	88	21	84
13	b/w Marine & Pilot/Marina/Boat Yard	LOT	40	18	45	15	38	18	45	15	38
14	b/w Pilot & Reynolds Streets/LIDO Sea Food Restaurant	LOT	30	22	73	32	107	19	63	32	107
15	b/w Early and Pell Streets/UK Sail workers	LOT	10	5	50	5	50	5	50	5	50
16	b/w Winters & Centre Streets/Auto Repair Shop	LOT	10	5	50	6	60	8	80	7	70
17	b/w Winters & Centre Streets/Chase Bank	LOT	10	4	40	6	60	8	80	8	80
18	b/w Pilot & Scholfield/Marina/Boat Yard	LOT	10	11	110	11	110	11	110	11	110
19	b/w Pilot & Scholfield/Marina/Boat Yard	LOT	150	126	84	116	77	126	84	105	70
20	b/w Pilot & Scholfield/Marina/Boat Yard	LOT	45	19	42	15	33	19	42	15	33
21	b/w Schofield & Caroll Streets/Residential	LOT	16	11	69	5	30	13	81	6	38
22	b/w Deep Water & Banta La/Residential	LOT	30	21	70	4	13	19	63	6	20
23	b/w Banta La & Fordham Streets/Residential	LOT	30	16	53	11	37	17	57	3	30
24	b/w Fordham Place & Wineward Lane/Marina/Boat Yard	LOT	20	13	65	11	55	13	65	11	55
25	b/w Tier & Bay Streets/Residential	LOT	30	18	60	7	23	16	53	5	17
26	b/w Tier & Reville Streets/Crab Shanty Restaurant	LOT	18	5	28	14	78	18	100	16	89
27	b/w Reville & Ditmars Streets/Artie's Restaurant	LOT	20	7	35	17	85	13	65	20	100
28	b/w Ditmars & Bowne Streets/Sunoco Gas Station	LOT	10	9	90	9	90	9	90	9	90
29	b/w Bowne & Beach Streets/Sea Food City	LOT	180	100	56	132	73	132	73	130	72
30	b/w Bowne & Beach/Residential	LOT	10	7	70	3	30	6	60	3	30
31	Corner of Beach Street/Private Construction Site	LOT	10	14	140	14	140	14	140	14	140
32	b/w Beach & Cross Streets/Burcks Hardware Store	LOT	10	7	70	7	70	8	80	8	80
33	b/w Beach & Cross Streets/Residential	LOT	103	66	64	55	53	71	69	53	51
34	Corner of Cross Street/American Legion	LOT	25	5	20	13	52	5	20	8	32
35	b/w Cross & Kilroe Streets/Marina/Boat Yard	LOT	10	11	110	11	110	11	110	11	110
36	b/w Cross & Bridge Streets/Sea Shore Restaurant	LOT	85	61	72	89	105	51	60	83	98
37	b/w Cross & Bridge Streets/Harbor Restaurant	LOT	80	45	56	93	116	71	89	83	104
38	b/w Kilroe & Bridge Streets/Seaview Restaurant	LOT	25	13	52	26	104	23	92	25	100
39	b/w Bridge & Sutherland Streets/Marina/Boat Yard	LOT	10	8	80	7	70	8	80	7	70
40	b/w Terrace and Bridge St/J.P.s Seafood Restaurant	LOT	25	21	84	26	104	26	104	25	100
41	b/w Bridge & Terrace Streets/Lobster House	LOT	14	7	50	14	100	14	100	13	93
42	b/w Bridge & Terrace Streets/Seafood Restaurant	LOT	30	21	70	32	107	24	80	32	107
43	b/w Bridge & Terrace Streets/Marina/Boat Yard	LOT	35	27	77	22	63	27	77	22	63
44	Corner of Fordham Street/Fordham Place/Residential	LOT	66	40	61	35	53	43	65	40	61
	Total Parking on City Island		**1,791**	**1162**	**65**	**1481**	**83**	**1371**	**77**	**1448**	**81**
	Pelham Park Area										
45	NYC Police Department / Firing Range	LOT	54	53	98	81	150	47	87	46	85
46	Orchard Beach Parking Lot	LOT	6000	2778	46	2315	39	3440	57	2580	43
47	Orchard Beach (NYPD/DPR Employees Only)	LOT	70	221	316	198	283	210	300	188	269
48	City Island Road /Turtle Cove Golf / Baseball Field	LOT	98	108	110	97	99	106	108	91	93
49	North Shore & City Island Roads / Riding Stable	LOT	20	15	80	9	45	17	85	13	65
50	Pelham Park Golf Clubs	LOT	400	167	42	137	34	186	47	119	30
	Total Parking in the Pelham Park		**6,642**	**3342**	**50**	**2837**	**43**	**4006**	**60**	**3037**	**46**

TABLE 7-8c
Off-Street Parking Facilities - Marinas/Boatyards (Location, Capacity and Utilization Rates)

No.	LOCATION City Island Avenue	Boats/ LOT	Capacity (#)	Utilization Rate					
				Weekdays					
				AM Peak		MD Peak		PM Peak	
				(#)	(%)	(#)	(%)	(#)	(%)
1	Corner of Belden Street	LOT	33	32	95	32	95	32	95
2	b/w Belden & Rochelle Sreets	LOT	106	80	75	80	75	80	75
3	b/w Pilot & Reynolds Streets	LOT	70	68	98	68	98	68	98
4	b/w Reynolds & Pell Streets	LOT	195	205	105	205	105	205	105
5	b/w Pell & Earley Streets	LOT	270	269	100	269	100	269	100
6	b/w Winters & Centre Streets	LOT	75	79	105	79	105	79	105
7	b/w Fordham & Tier Streets	LOT	230	252	110	252	110	252	110
8	b/w Ditmars & Kirby Streets	LOT	20	21	105	21	105	21	105
9	b/w Ditmars & Kirby Streets	LOT	50	53	105	53	105	53	105
10	b/w Ditmars & Kirby Streets	LOT	22	21	95	21	95	21	95
11	b/w Kirby & Bowne Streets	LOT	100	95	95	95	95	95	95
12	Corner of Beach Street	LOT	55	58	105	58	105	58	105
13	b/w Beach & Cross Streets	LOT	65	63	97	63	97	63	97
14	Corner of Cross Street	LOT	70	63	90	63	90	63	90
15	b/w City Island Bridge & Bridge Street	LOT	50	42	84	42	84	42	84
	Total Parking for the Boats		**1,411**	**1399**	**98**	**1399**	**98**	**1399**	**98**

No.	LOCATION City Island Avenue	Boats/ LOT	Capacity (#)	Utilization Rate							
				Saturday				Sunday			
				MD Peak		PM Peak		MD Peak		PM Peak	
				(#)	(%)	(#)	(%)	(#)	(%)	(#)	(%)
1	Corner of Belden Street	LOT	33	32	95	32	95	32	95	32	95
2	b/w Belden & Rochelle Sreets	LOT	106	80	75	80	75	80	75	80	75
3	b/w Pilot & Reynolds Streets	LOT	70	68	98	68	98	68	98	68	98
4	b/w Reynolds & Pell Streets	LOT	195	205	105	205	105	205	105	205	105
5	b/w Pell & Earley Streets	LOT	270	269	100	269	100	269	100	269	100
6	b/w Winters & Centre Streets	LOT	75	79	105	79	105	79	105	79	105
7	b/w Fordham & Tier Streets	LOT	230	252	110	252	110	252	110	252	110
8	b/w Ditmars & Kirby Streets	LOT	20	21	105	21	105	21	105	21	105
9	b/w Ditmars & Kirby Streets	LOT	50	53	105	53	105	53	105	53	105
10	b/w Ditmars & Kirby Streets	LOT	22	21	95	21	95	21	95	21	95
11	b/w Kirby & Bowne Streets	LOT	100	95	95	95	95	95	95	95	95
12	Corner of Beach Street	LOT	55	58	105	58	105	58	105	58	105
13	b/w Beach & Cross Streets	LOT	65	63	97	63	97	63	97	63	97
14	Corner of Cross Street	LOT	70	63	90	63	90	63	90	63	90
15	b/w City Island Bridge & Bridge Street	LOT	50	42	84	42	84	42	84	42	84
	Total Parking for the Boats		**1,411**	**1399**	**98**	**1399**	**98**	**1399**	**98**	**1399**	**98**

8.0 PUBLIC TRANSPORTATION

Public transportation plays an important role in any traffic and transportation system. Public transportation includes surface transit (buses, vans, and livery/taxi services), subways, commuter railroads, and ferries. Limited public transportation services (one local bus and two express), are provided to and from the study area. Public transportation from the study area includes buses and taxi/car services.

8.1 Subways

Subway and rail services are available but not within the study area. Commuters traveling to and from City Island must use the local bus (Bx 29 and the subways 2, 5, 6). The No. **6** train stops at Pelham Bay Park Station (Westchester Avenue/Burr Avenue), No. **5** train stops at Pelham Parkway/Williamsbridge Road or Eastchester/Dyre Avenue, and the No. **2** (and No. **5**) train stops at Pelham Parkway/White Plains Road or E. Gun Hill Road/White Plains Road.

8.2 Surface Transit

As previously stated New York City Transit provides one local bus (Bx29) to serve the City Island community. The Bx29 bus originates at Bay Plaza (CO-OP City) and terminates at the southern-most tip on the island on City Island between Rochelle and Belden Streets just north of Belden Point. The Bx29 bus operates between 4:30 AM and 12:08 PM (Weekdays), 4:30 AM and 1:00 AM (on Saturday) and 5:30 AM and 11:58 PM (on Sunday) with the headways of 15 to 30 minutes. Ridership data and the field survey showed that the Bx29 currently operates below capacity because the primary mode of transportation for residents and visitors is the private auto. The bus is used primarily by those who do not drive or are traveling to the subway stations. Express bus service to and from the island to Manhattan operates during the morning and evening rush hours only. Additionally, the B-L 45 bus serves patrons of the study area - Pelham Park via Hutchinson River Parkway and North Shore Road (from traffic circle) and further via Pelham Road connecting Pelham Bay Park Station in Bronx and New Rochelle, Westchester. There are also two seasonal buses that operate within the study area during the summer months. The Bx12 operates between Orchard Beach and either Sedgwick Avenue or Broadway/West 207 Street, Inwood, Manhattan during the summer months. Also, the Bx5 operates between West

Farms Road/Southern Boulevard and Orchard Beach and operates on summer weekends only. In addition to the bus service, a few local car service companies provide services to the island residents and visitors on daily basis.

Exhibit 8-1 shows all existing bus lines and Amtrak (which passes beyond the study area boundaries and currently do not have stations in close proximity to the study area) line in the study area.

8.3 Ferry

Currently, there is no ferry service for the public to City Island or the study area. Although, a functional pier is located on City Island at the end of Fordham Street, it is under the jurisdiction of the Departments of Correction (used for prison purposes) and Transportation (used for the cemetery purposes located nearby on the Hart Island). This site will be further investigated for potential use for commuters during the summer. The new ferry service would connect City Island to Manhattan/Bronx and the region for commuting and recreational purposes. Exhibit 8-2 shows the site of the existing pier on the end of Fordham Street and scattered boat dockings on the island.

Exhibit 8-1

Existing Bus and Rail Lines

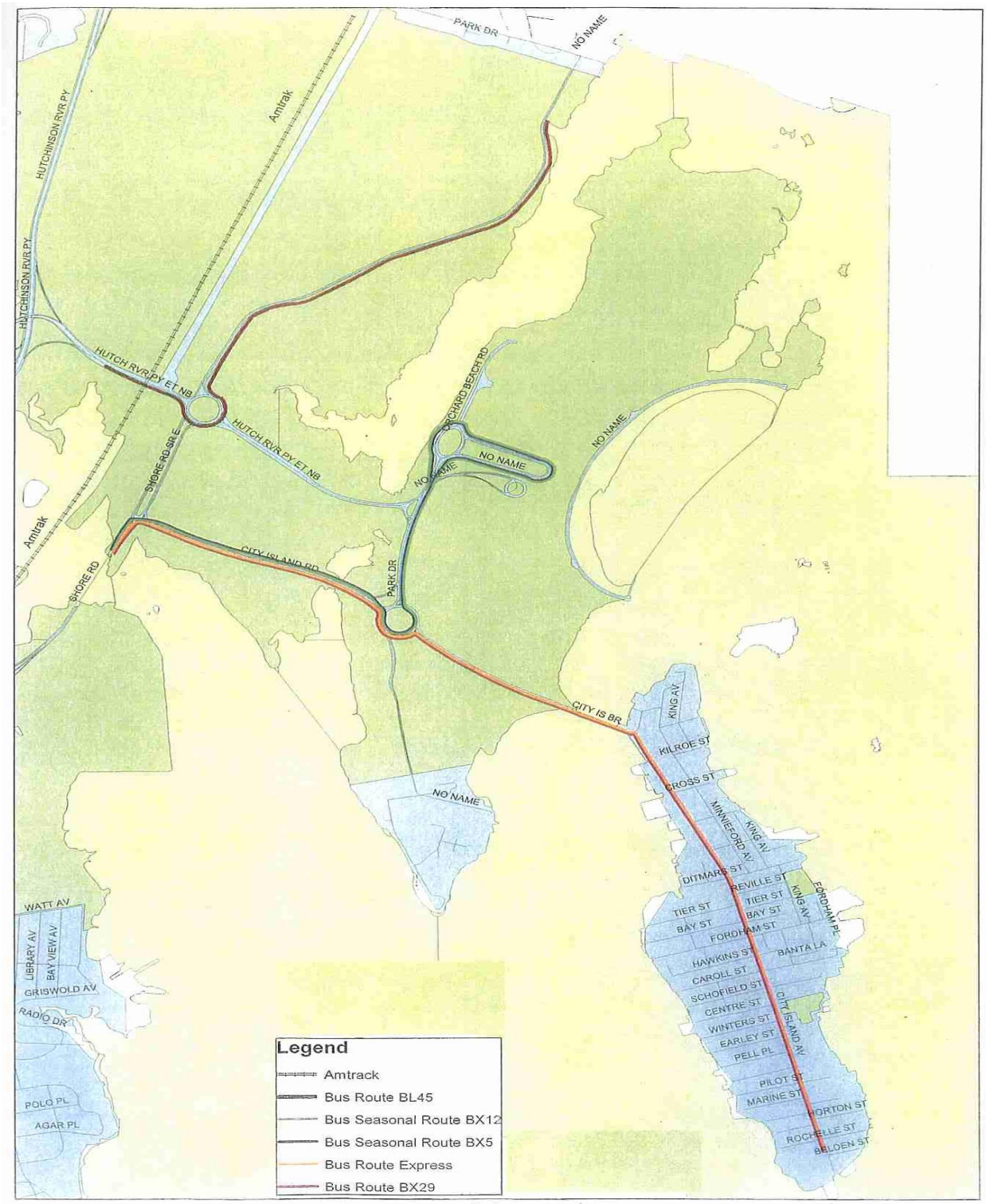
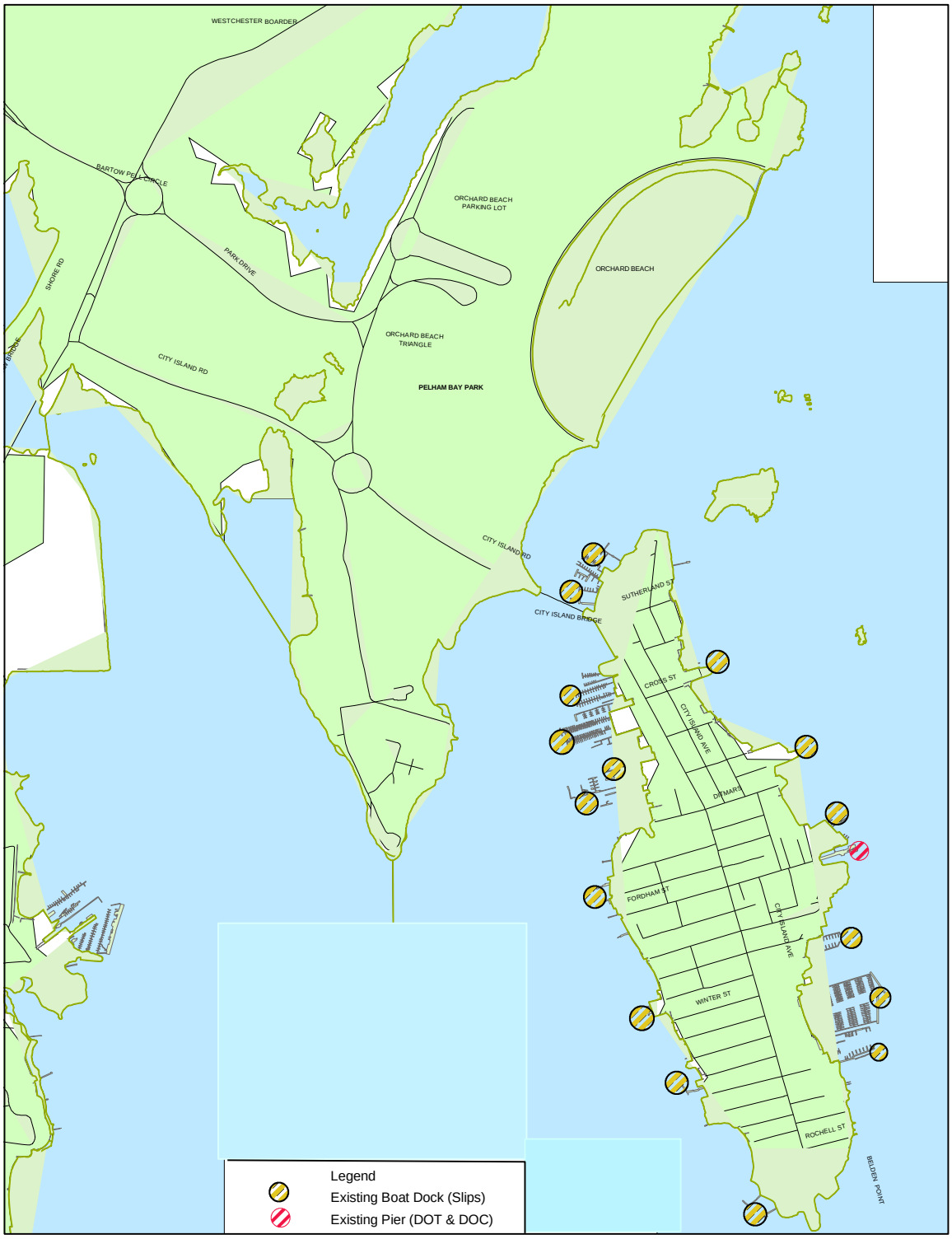


Exhibit 8-2 Existing Pier and Boat Docking



8.4 Future Transit Conditions

Automobile usage is expected to remain the predominant transportation mode in the study area (City Island). Future economic and population growth would increase future demand on public transportation. To be consistent, it is assumed that a 0.5 percent growth per year is anticipated in the future ridership on major routes in the study area. Ridership data and the field survey showed earlier (under existing condition) that the Bx29 operated below capacity for the entire length of City Island Avenue because most residents and visitors use their private auto. These conditions are not expected to change significantly under future conditions.

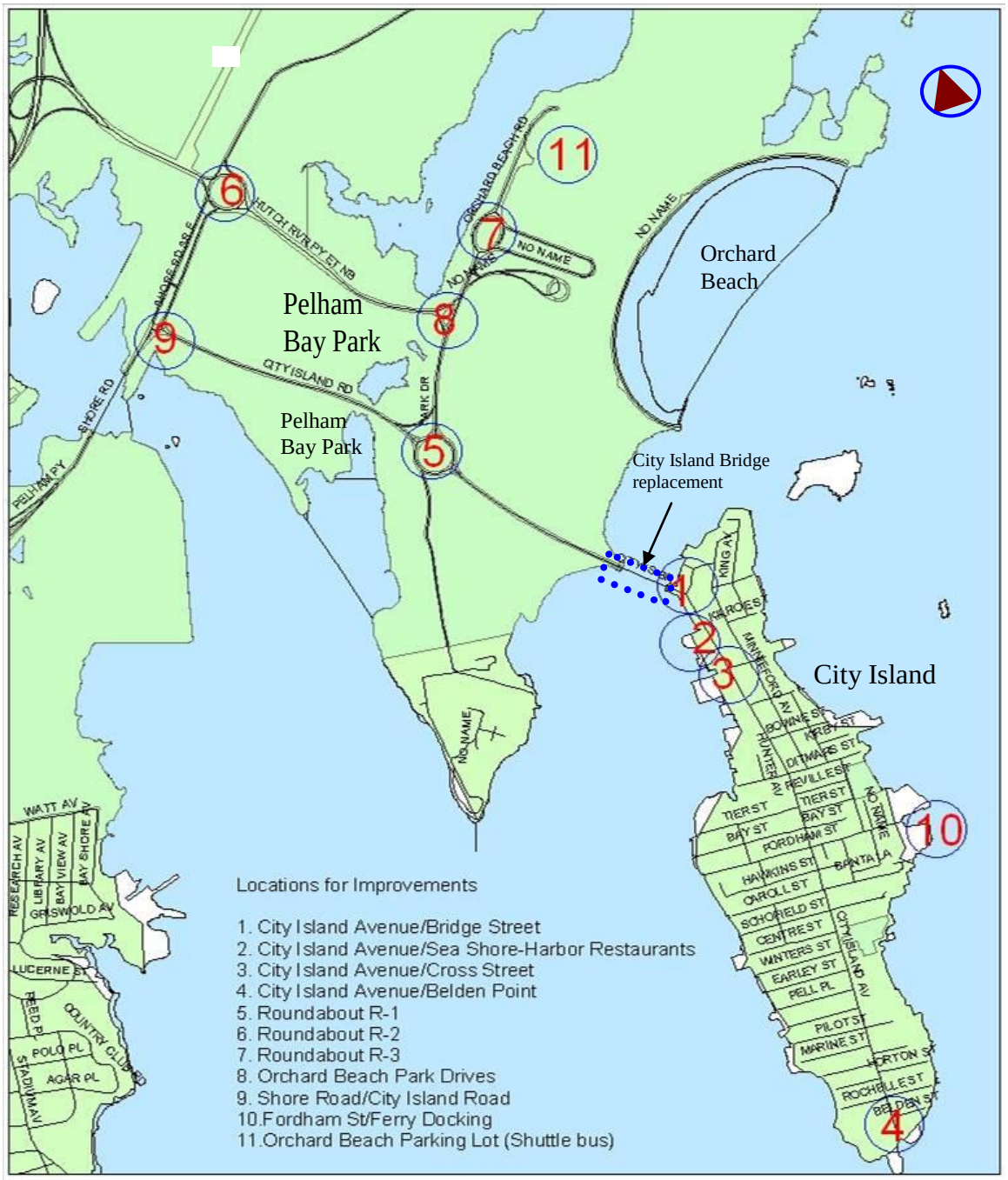
Future plans call for redevelopment of the existing boatyard and marina (The Royal Marina) to construct 22 two-family detached homes, between Cross-and Beach Streets. Fifty boat slips will be designated to the new development, while the remaining 70 will be leased to private users. In addition, there will be 107 accessory parking spaces, of which 68 spaces will be for the new development and 39 spaces for the private boat slips.

9.0 RECOMMENDATIONS

The City Island Transportation Study conducted a comprehensive examination and analysis of the area's existing and future travel conditions and identified several critical areas 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 and into the park.

The recommendations and improvement measures are aimed to address issues such as accessibility, circulation, congestion and queuing, parking, roadway capacity and safety of all road users (motorists, pedestrians and cyclists) in the area. These improvements would be accomplished mainly through the design of roadway, crosswalk, sidewalk, signals and other traffic controls, signs, and pavement markings. The promotion of mass transit through innovative solutions such as seasonal ferry, trolley, or shuttle bus services were also considered as possible options. This would benefit the City Island community (residents and businesses) at large. Exhibit 9.1 shows the locations where improvements are recommended.

Figure 9-1: 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 9-2).

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.

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.

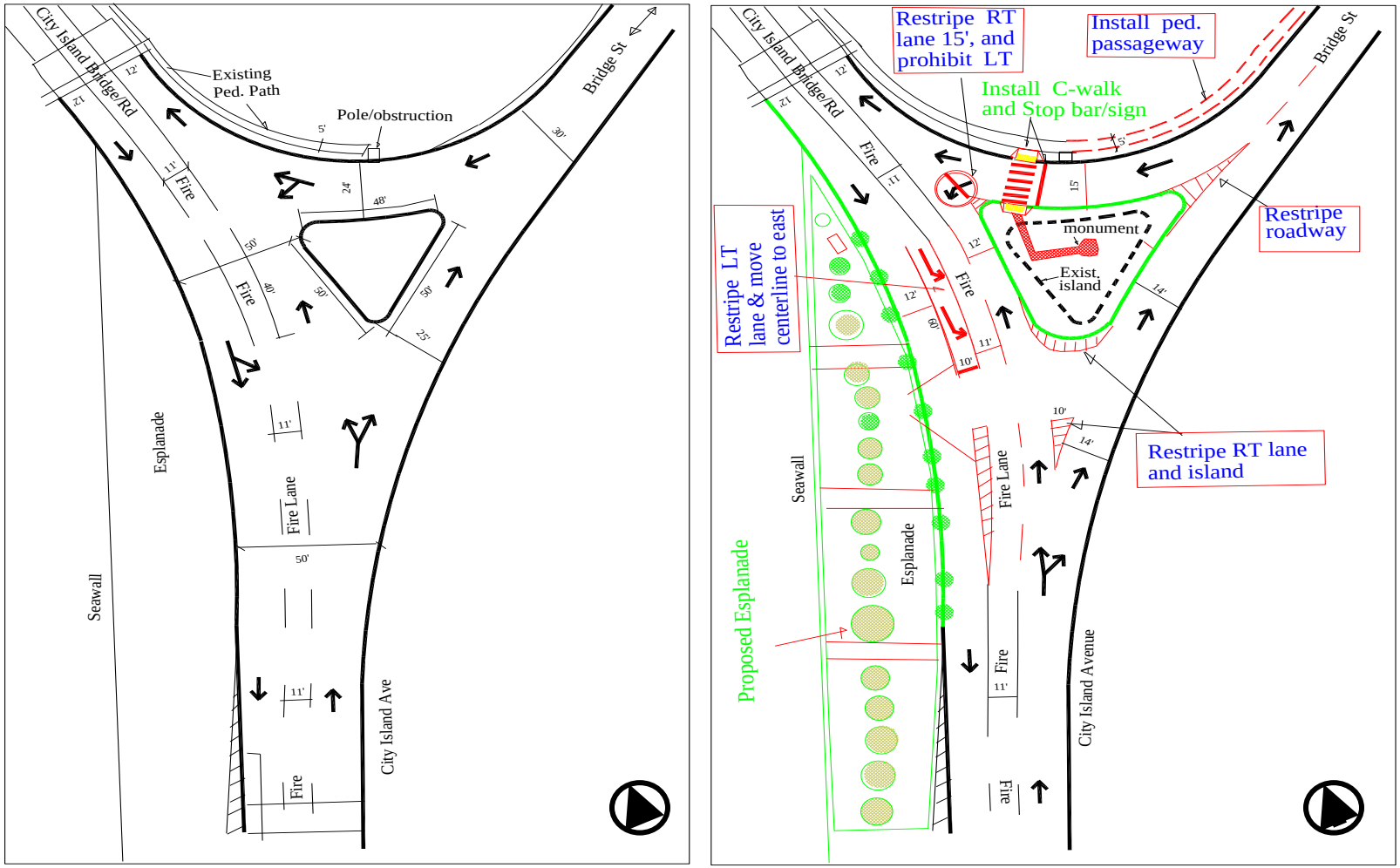
City Island Avenue and Bridge Street

Diverted Traffic along Minnieford Avenue from Bridge Street

Figure 9-2: 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.

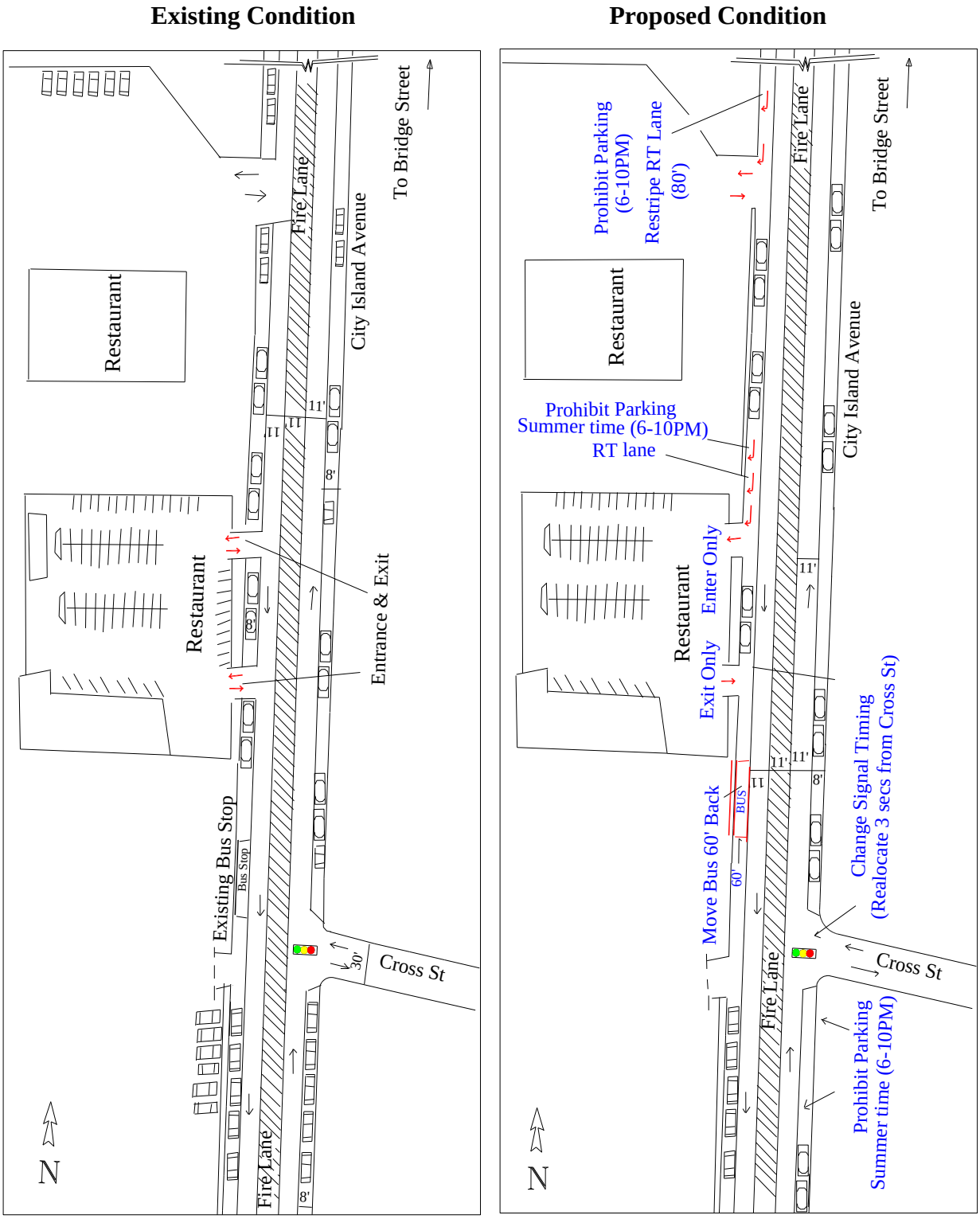


2. City Island Avenue between Bridge and Cross Street

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 9-3 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 9-3: 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 9-4 shows locations at Belden Point proposed for loading/unloading zones.

Figure 9-4: 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 9-5 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

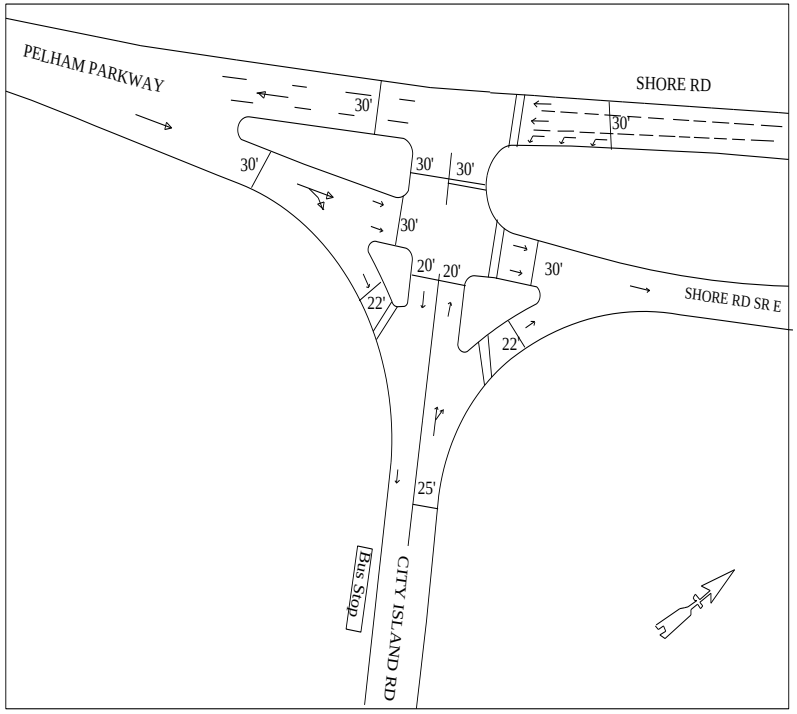
Cycle length = 60 seconds
City Island Road WB = 25 seconds
Shore Road SB/NB = 25 seconds
Each phase includes 3 seconds of Yellow and 2 seconds of All-Red.

Proposed Summer (Seasonal) Signal Timing Plan

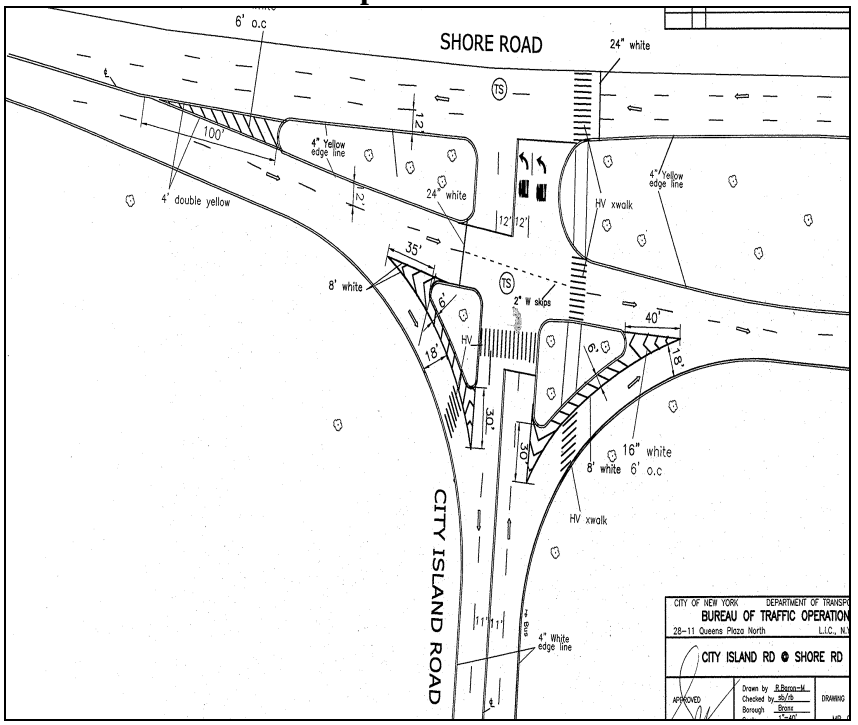
Cycle length = 90 seconds
City Island Road WB = 35 seconds
Shore Road SB = 18 seconds
Shore Road SB/NB = 22 seconds
Each phase includes 3 seconds of Yellow and 2 seconds of All-Red.

Figure 9-5: City Island Road and Shore Road/Pelham Parkway Intersection

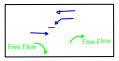
Existing Condition

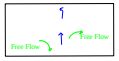


Recent Improvements



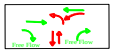
Existing Signal Timing Plan
Cycle = 60 secs

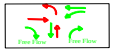

Phase 1 =30 secs


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)

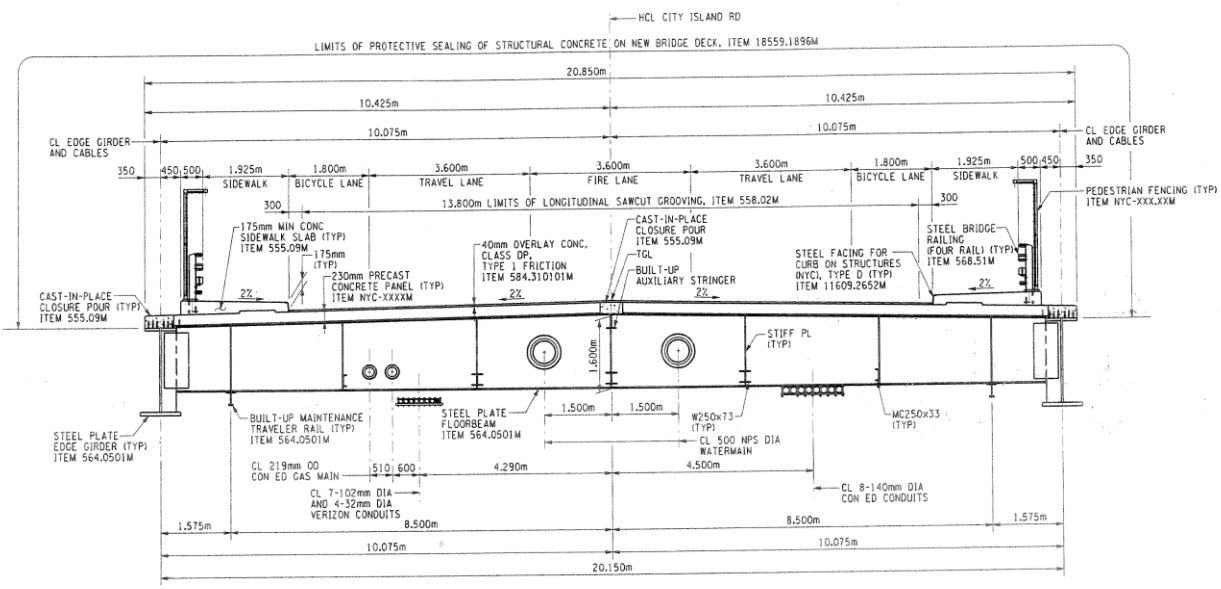
Note: Each phase includes Y+R = 3+2 secs.

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:

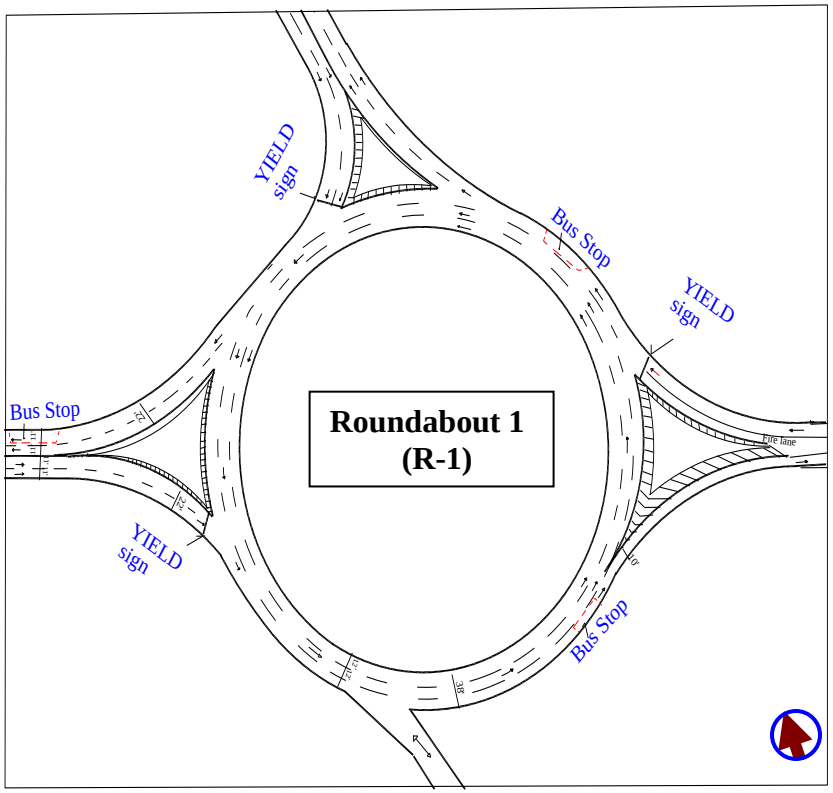
a. Restripe circular roadway to clearly delineate the two through inner lanes and the shared through-right (outer) lane for all three Roundabouts.
b. Install pavement markings/arrows to improve maneuverability through each roundabout and to minimize weaving.

Roundabout R-1

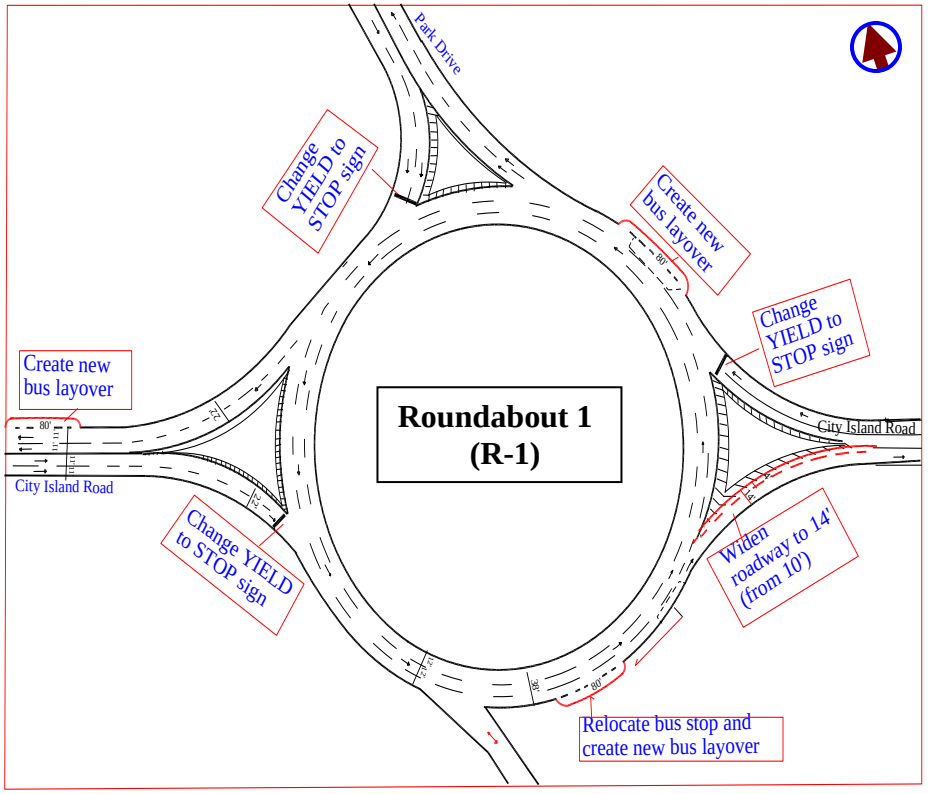
a. Restripe City Island Road (exiting circle EB towards City Island) to one moving lane (14 feet wide).
b. Replace the existing 'Yield' signs with 'Stop' signs at Roundabout (R-1) as currently exists at Roundabout 2.
c. Relocate the southeast bus stop farther west and create bus layover at the southwest, 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 9-6 shows improvements for Roundabout 1.

Figure 9-6: 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.

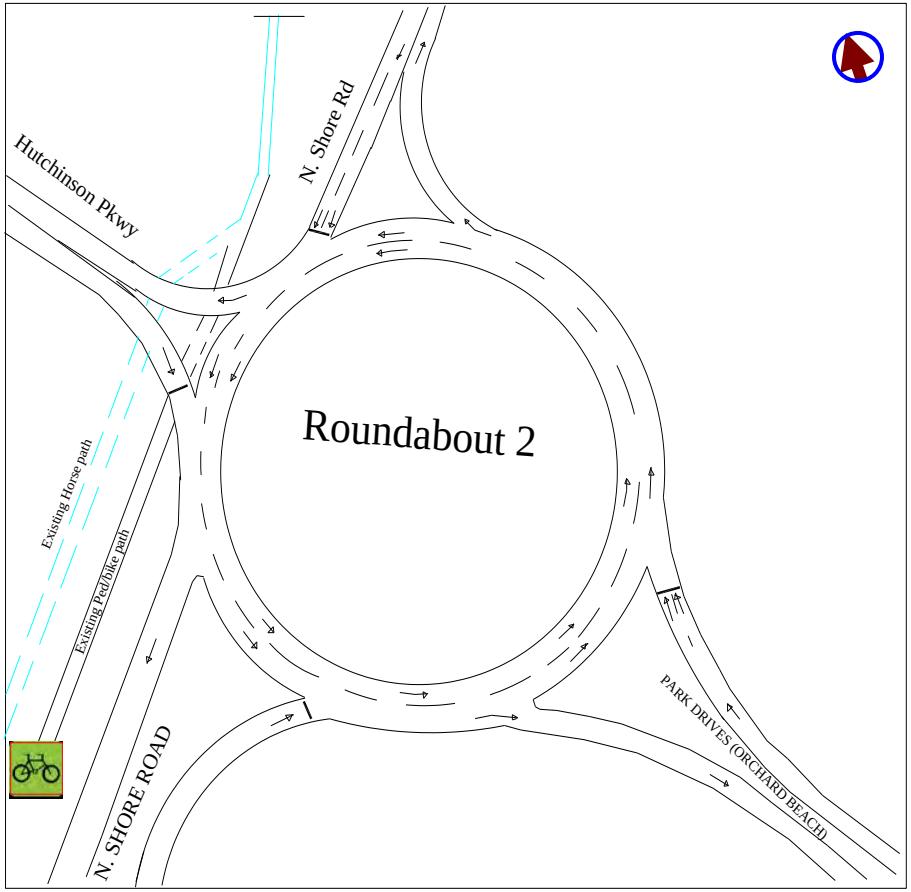
Figure 9-7 shows improvements for Roundabout 2 (R-2).

Roundabout R-3

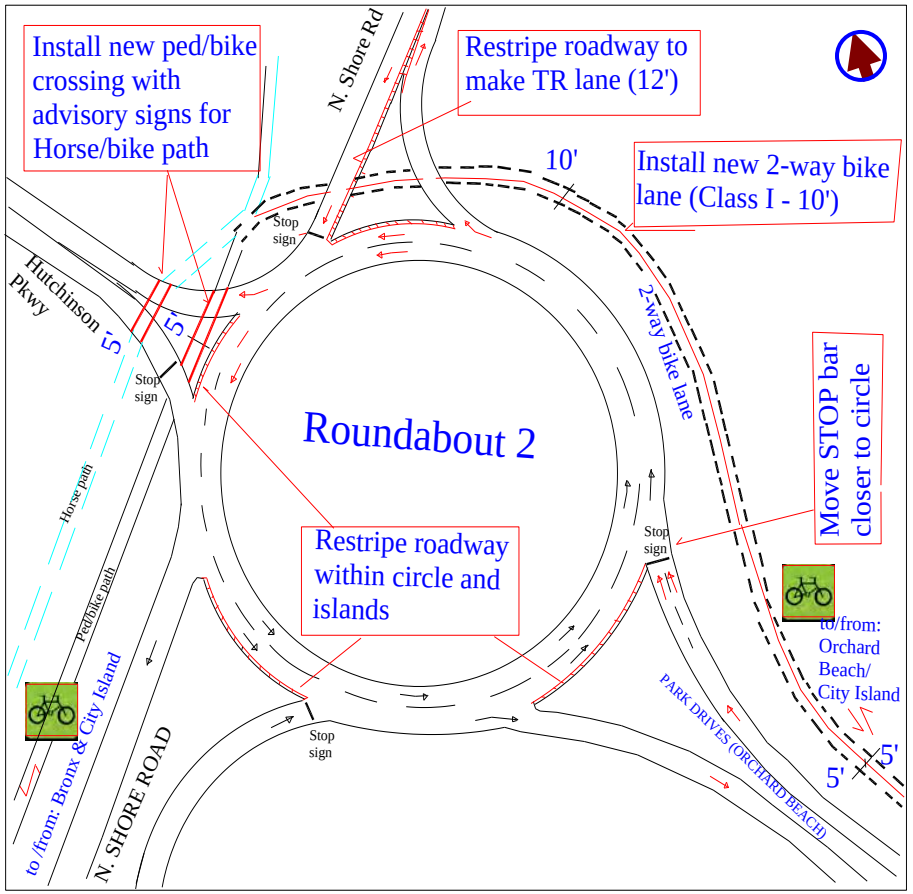
No improvement measures are recommended for this location as it operates optimally.

Figure 9-7: 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).

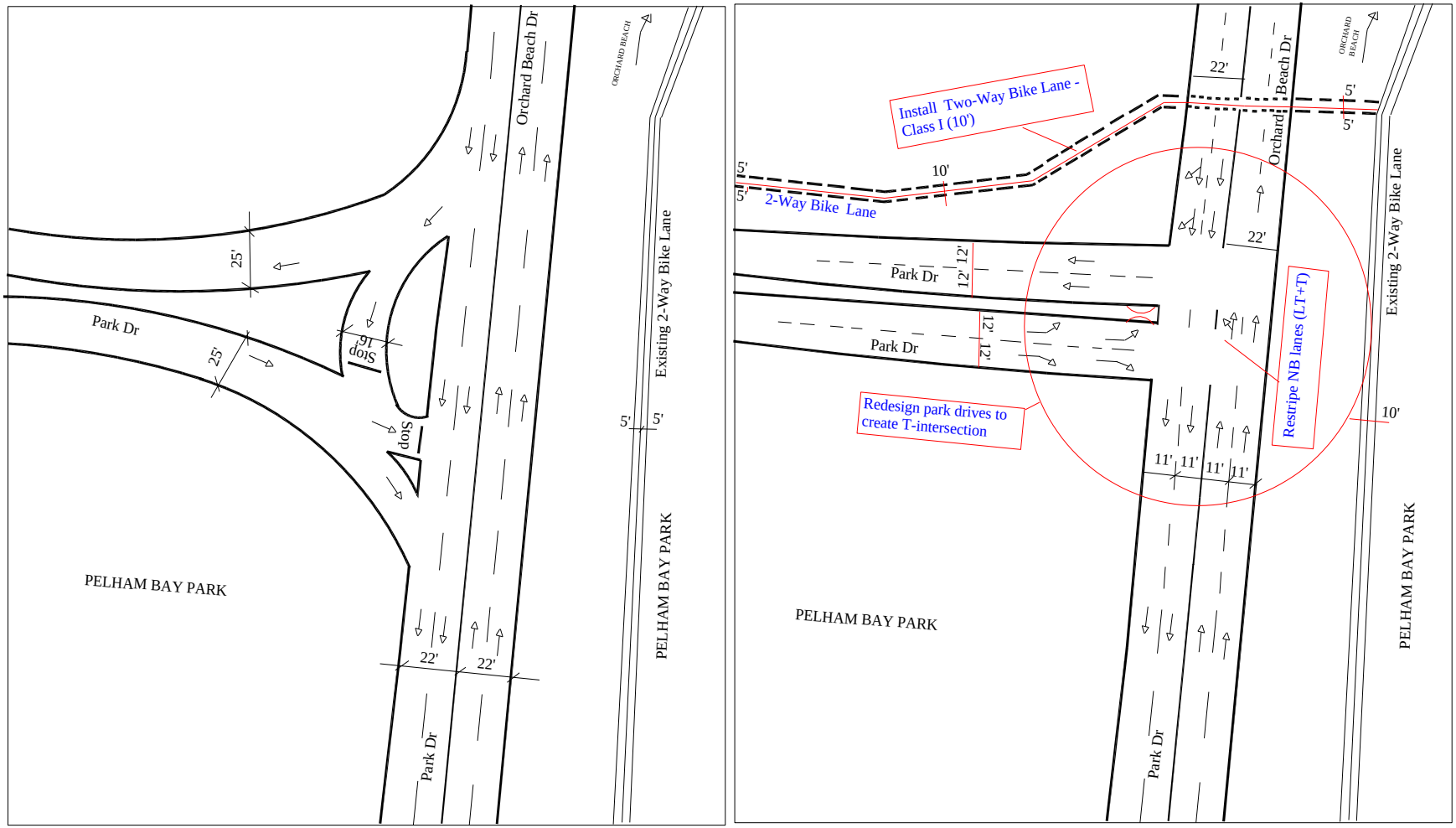
d. Install additional information/advisory signs (directional to bike path/destination, observing bike crossing, and location of bike racks) for motorists, bicyclists and pedestrians especially on park drives and approaches to the roundabouts.

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 9-8 shows the proposed improvements at this location.

Figure 9-8: 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:

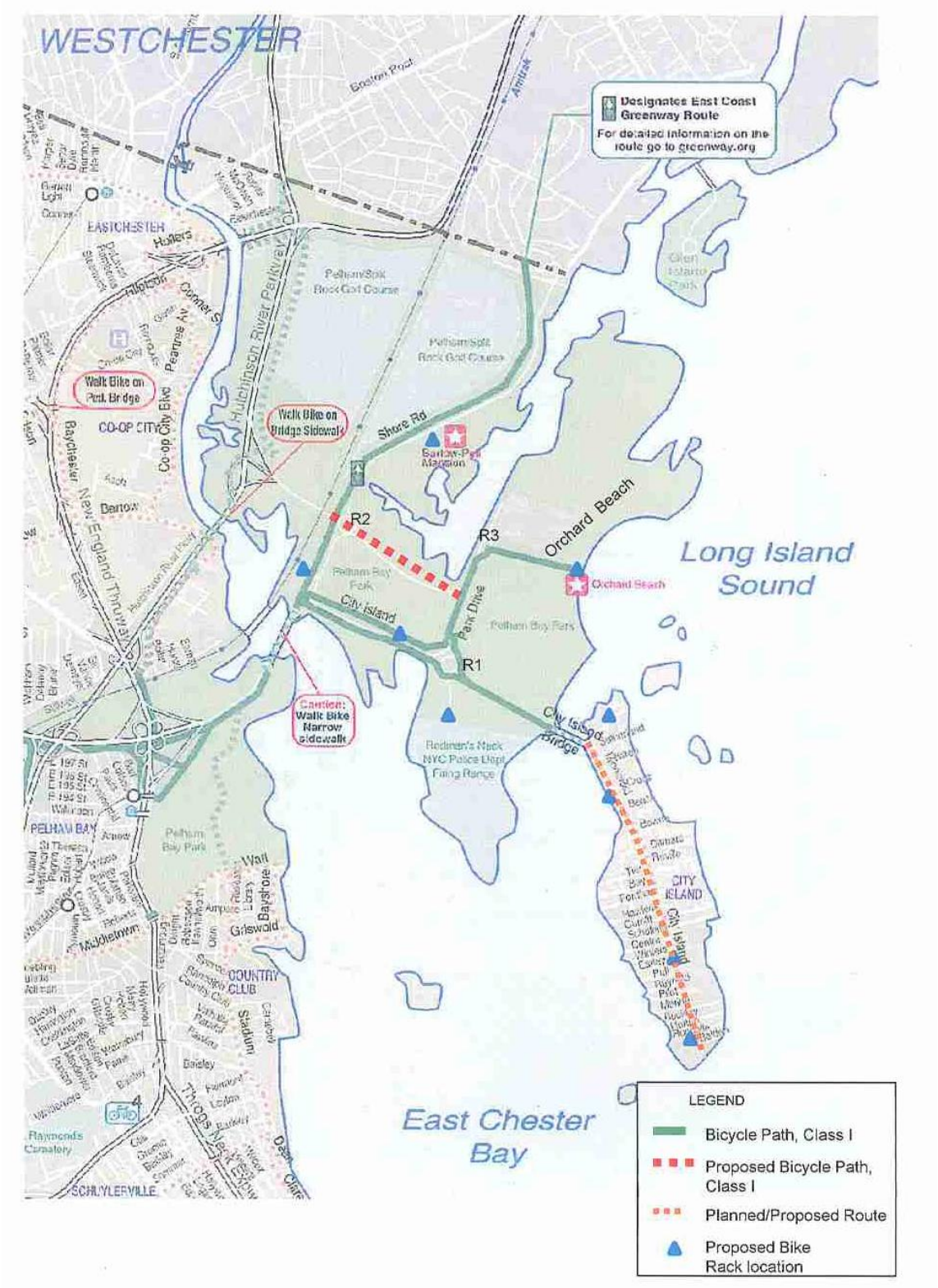
a. Install new and widen existing crosswalks to 12 feet clearly designating pedestrian path at the following intersections along City Island Avenue - Bridge, Cross, Ditmars, Fordham, Winters and Rochelle Streets.

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 9-9, which also shows the existing and proposed bike routes in the study area.

Figure 9-9: Existing and Proposed Bike Routes



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

10.0 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. Improvement measures recommended by DOT in this report could have far-reaching implications, and could serve as a transportation model for improved conditions. Some of the recommendations proposed in this report do not fall under the jurisdiction of NYCDOT and will require coordination with other operational agencies, such as NYC Transit and the NYC Department of Parks and Recreation.

The analyses of the existing, and future conditions (2013) with recommendations contained in this report were identified through field observations, on-site meetings with community board district managers, discussions with the Technical Advisory Committee, officials from the other City agencies, public and involving analyses of various data. Some of recommended improvements (those urgently needed) could be implemented immediately, while some of them can be planned for a longer strategic plan. Recommendations for the long-term improvements suggested in the report may or may not require further analysis to determine feasibility.