Far Rockaway Central Business District (CBD) – Traffic Study

Draft Report

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NEW YORK METROPOLITAN TRANSPORTATION COUNCIL

Far Rockaway Central Business District (CBD) Traffic Study

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EXECUTIVE SUMMARY

S.1 Introduction

The Far Rockaway Central Business District (CBD) Traffic Study was initiated not only in response to requests from the community and elected officials to address traffic congestion, and safety. It also seeks to contribute to the economic revitalization of the CBD by providing baseline data and analysis for a broader Urban Design effort. The Far Rockaway peninsula has seen significant growth in urban development over the past decade while the CBD or commercial core has experienced economic decline (many stores have closed and storefronts remain shuttered) and needs to be revitalized. Cognizant of these developments, the study seeks to assess existing and future traffic and transportation needs and to make recommendations to facilitate and support future efforts to revitalize the CBD.

The study area boundaries are Beach 9th St./Caffrey Avenue/Beach 17th Street in the east; Pinson St./Beach Channel Dr./Rockaway Freeway in the west; Horton Avenue/Minton St./Alonzo Rd. (extensions) in the north, and Seagirt Blvd./Beach 25th Street in the south.

S.2 Demographics

According to the 2010 census, the population of the study area was 17,993 with a population density of approximately 21,116 persons per square mile. The population in the study area grew by 14% from 1990 to 2010 similar to Queens and New York City with 14% and 12%, respectively. The average household size was 3.0 with a median household income of $39,117. The study area's median household income was approximately 30% and 23% less than that of Queens and NYC, respectively. About 46% of households own one or more vehicles. Journey to work mode share for the study area was 42.8% public transit with Queens 52.7% and NYC 58.4%. Auto was the primary mode for journey to work. The study area auto share is 41% compared to 40.1% for Queens and 30% for NYC. Walking represented 13.2% in the study area, 5.8% in Queens and 10.6% in NYC.

S.3 Land Use and Zoning

A review of the existing land use and zoning districts in the study area reveals a predominantly residential picture which accounts for approximately 60% of the total area. The residential district which is found mostly outside the commercial areas allows for lower density (one and two family detached homes) as well as high density areas with the presence of multi-family elevator buildings.

The commercial district, which is centrally located along Mott Avenue, Central Avenue/Beach 20th Street, Cornaga Avenue, and Beach Channel Drive, accounts for approximately 35% of the study area. The manufacturing/industrial uses represents the remaining 5% and are concentrated in the northern part of the study area adjacent to the LIRR Far Rockaway station.

S.4 Traffic and Transportation

The major east-west corridors in the study area are Mott Avenue, Cornaga Avenue and Seagirt Boulevard. The major north-south corridors are Beach Channel Drive and Central Avenue/Beach 20th Street. There are other major transportation facilities in close proximity to the study area such as the Nassau Expressway (I-878) which facilitates regional travel and connects to Flatbush Avenue, Rockaway Boulevard and the Rockaway Turnpike. Beach Channel Drive is the only through truck route in the study area.

The traffic analysis assessed traffic operations at 14 intersections for three peak hours – AM (8-9), PM (4:30-5:30), and Saturday Midday (12:15-1:15). The analysis showed that most intersections operated at acceptable LOS D or better except for four locations where some lane groups experienced LOS E or F during some peak periods.

Travel speed runs were conducted along Mott Avenue, Central Avenue/Beach 20th Street, and Beach Channel Drive during the PM peak. The data showed that Central Avenue/Beach 20th Street had the lowest travel speed with 6 mph in the southbound direction.

The only truck route, Beach Channel Drive, recorded truck volume during the AM peak that represented approximately 4% of the total traffic.

S.5 Public Transportation

The MTA operates three bus lines (QM17, Q22 and Q113), a subway line (A-Train at Mott Avenue/Far Rockaway station) and a commuter rail line (LIRR Far Rockaway branch) in the study area.

There is the MTA-NYC bus terminal on Beach 21st Street between Mott and Cornaga Avenues next to the Far Rockaway #2 Municipal parking lot, and the Mott Avenue Far Rockaway A-Train terminal.

The Nassau Inter-County Express (NICE) system also operates three bus lines within the study area (N31, N32, N33).

S.6 Parking

The parking analysis examined existing on-street and off-street parking supply and demand for the peak hours. An inventory of off-street parking (garage/lots) reveals there are 54 accessory parking facilities with a combined capacity of 1,819 spaces. There are no privately owned parking garages or lots in the study area. The only public parking facility in the study area is the *"Far Rockaway #2 Municipal Parking Field"* with 70 spaces. It is located on Beach 21st Street between Mott and Cornaga Avenues adjacent to the subway station.

On- street parking capacity inventory and survey reveal there are approximately 981 on-street parking spaces in the study area of which 139 are metered parking. The study area's AM, PM and Saturday Midday parking utilization is 61%, 74% and 75%, respectively. The off- and on-street parking supply in the study area is currently fairly adequate to satisfy existing demand; however, on-street parking utilization on sections along commercial corridors such as Mott Avenue and Beach 20th Street is generally higher between 95-100% with the present of some double or illegal parking.

S.7 Pedestrians and Cyclists

The pedestrian analyses examine existing pedestrian travel conditions, pedestrian/vehicular conflicts, and their impact on traffic operation in the study area. It also serves to inform the broader DOT/EDC urban design initiative. Fourteen locations were selected for crosswalk and corner analyses. The highest crosswalk volumes were observed on Mott Avenue at

Beach 21st Street and Beach 20th Street south crosswalks with 589 and 700 pedestrians respectively, during the PM peak hour (4:30-5:30). All crosswalks and corners operate at acceptable LOS C or better, except for the south crosswalk at Mott Avenue and Beach 21st Street where LOS D exists.

Additional sidewalks, crosswalks, and corner counts were conducted to benefit the urban design initiative.

The study area has only one bicycle lane along Beach Channel Drive which changes between a Class 2 and Class 3 on different sections of the roadway.

S.8 Crashes/Safety

A detailed three years (2010 to 2012) crash/safety analysis was conducted for the study area, which revealed a total of 266 reportable crashes. These resulted in 290 injuries, 52 pedestrians and 11 cyclists with no fatalities. There was only one high crash location (Mott Avenue and Beach 20th Street) in 2010 with five pedestrian crashes.

Also, a corridor crash analysis was conducted for four main corridors for a five years (2007-2011) that ranks corridors using the Killed-Severity Index (KSI).

S.9 Public Participation and Community Input

Public participation was facilitated through a series of walk-throughs made in the study with community representatives and police precinct's officers to identify issues and discuss solutions. Public comments ranged from traffic congestion, pedestrian safety, bicycle, parking, accidents and transit issues.

S.10/S11 Preliminary Recommendations and Conclusion

Based upon analysis and community input a set of preliminary recommendations were developed to enhance safety and improve traffic operations at some locations in the study area. These recommendations include geometric changes, signal timing changes and pedestrian improvements, which will be evaluated for feasibility and implementation.

1 Introduction

1.1 Setting the Context

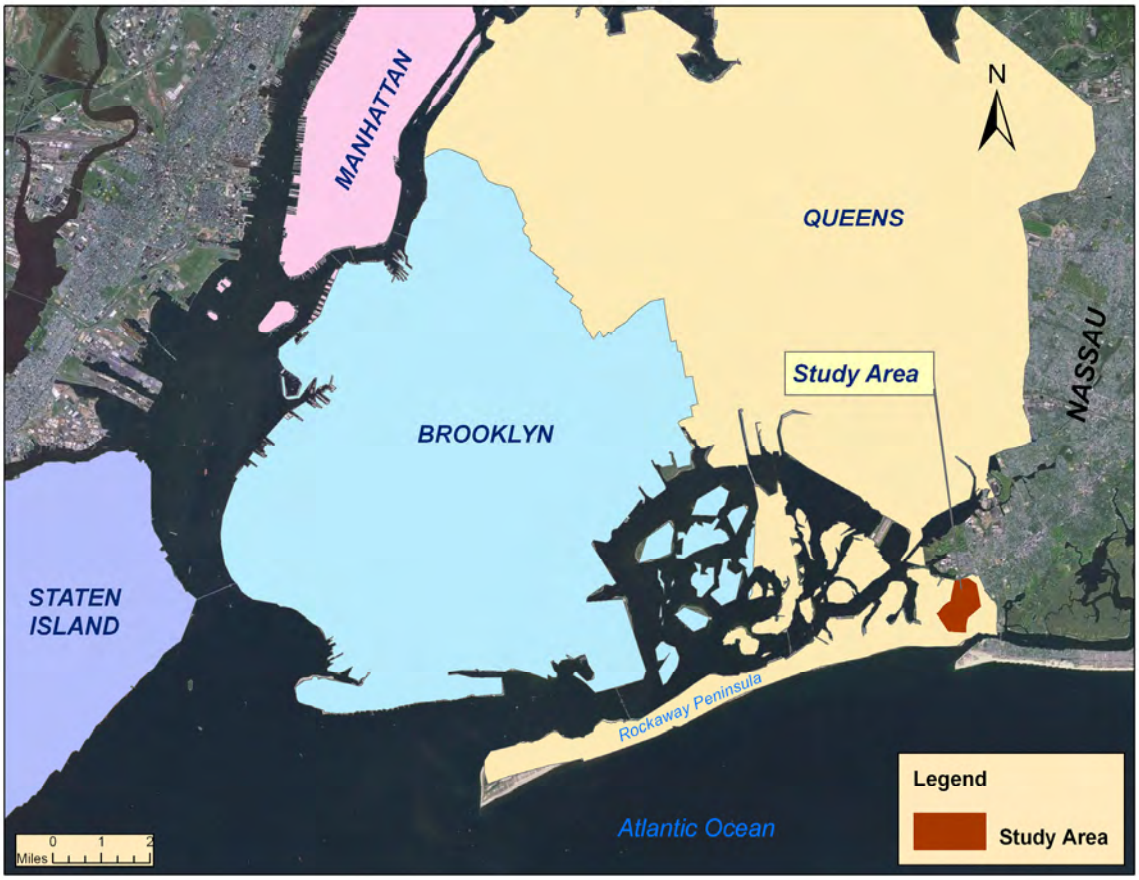
Far Rockaway is the eastern most section of the Rockaway Peninsula of Long Island in Queens, New York. The neighborhood is part of Community Board 14. Rockaway peninsula stretches 11 miles into lower New York Bay with a width of less than ¾ miles and separates Jamaica Bay from the Atlantic Ocean.

Far Rockaway has seen significant growth in urban development over the past decade as new residential and commercial developments such as Arverne by the Sea (2002) and Arverne East are underway. These plans provide from 4,000 to 6,000 new residential units and a site for commercial development on Mott Avenue. In 2008 the City Council approved a rezoning plan for five communities covering 280 blocks with the goal of stopping overdevelopment while at the same time allowing growth within the context of these neighborhoods.

Cognizant of these developments along with the need for transportation improvements which have not kept pace with growth on the peninsula and a declining Central Business District (CBD) in need of revitalization, State Senator Malcolm Smith, Congressman Gregory Meeks, and other elected officials expressed the need for NYCDOT, MTA-NYCT and LIRR to make short-term improvements to their facilities to support economic development in these neighborhoods. They also emphasized the need for a long term planning effort on the scale of a major investment study (MIS). Any infrastructure upgrade would contribute to the revitalization of the area, but of particular interest would be the CBD and the Mott Avenue Mall.

The Far Rockaway CBD traffic study is being conducted in response to community and elected officials requests. It is also the first phase of a three step process, i.e. Traffic Study, Urban Design, and Construction. Figure 1-1 shows the study area in a regional context.

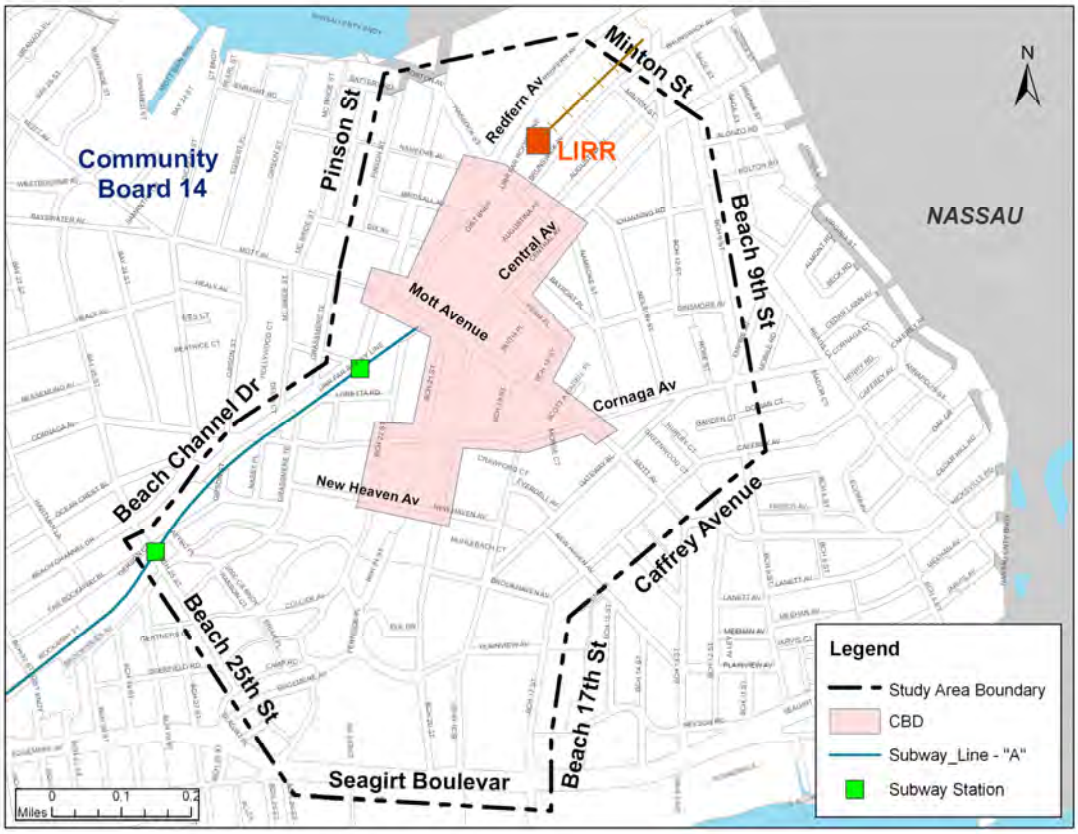
Figure 1-1: Study Area in Regional Context



1.2 Study Area

The study area, which is located in the eastern part of the Rockaway peninsula borders the Nassau County line, near to John F. Kennedy International Airport and the Nassau Expressway Interstate (I-878). The approximately 0.61 square mile study area is bounded by Beach 9th St./Caffrey Avenue/Beach 17th Street in the east; Pinson St./Beach Channel Dr./Rockaway Freeway in the west; Horton Avenue/Minton St./Alonzo Rd. (extensions) in the north, and Seagirt Blvd./Beach 25th Street in the south, see Figure 1-2.

Figure 1-2: Study Area & CBD



The study area comprises low to medium density residential districts with commercial uses and some industrial/manufacturing in the north-east section. There are few vacant lots throughout the area. The area is served by mass transit provided by MTA subway (A train – Mott Avenue), the LIRR (Far Rockaway terminal station), NYCT Regional Bus Operation (three bus lines), and Nassau Inter-County Express (three bus lines).

Growth in destination traffic to the area has slowed due to the closure of some stores in the Far Rockaway Shopping Center on Mott Avenue. However, there seems to be a significant volume of through traffic, as the main arterials in the area also facilitate regional travel to Long Beach, Nassau County and to other Boroughs. These arterials are the I-878, Seagirt Boulevard, Rockaway Turnpike, Rockaway Freeway/Beach Channel Drive and Central Avenue.

The study area street network is a hybrid of a grid and radial structure. This configuration creates an irregular network with many T-intersections and limited “through streets”. The absence of many through streets forces traffic to concentrate on the few major through routes in the area.

1.3 Goals and Objectives

The goal of the study is to assess and document existing traffic conditions, identify constraints and opportunities to facilitate infrastructure upgrade and make recommendations to address community concerns.

The study’s main objectives are:

- To conduct a comprehensive traffic and transportation analysis of the area including travel demand and needs with respect to all modes (auto, bikes, pedestrians, trucks and transit).
- Provide data and information to support the CBD Urban Design and infrastructure upgrade initiative.
- Develop improvement measures to reduce vehicular congestion, improve traffic circulation and facilitate urban revitalization.

The analysis of the existing conditions will focus on the following:

- *Demographics/Socioeconomic Characteristics*
- *Land Use & Zoning*
- *Vehicular Traffic/ Goods Movement*
- *Pedestrians and Bicycle activity*
- *Crashes and Safety issues*
- *Parking and*
- *Public Transportation.*

2 Demographic Analysis

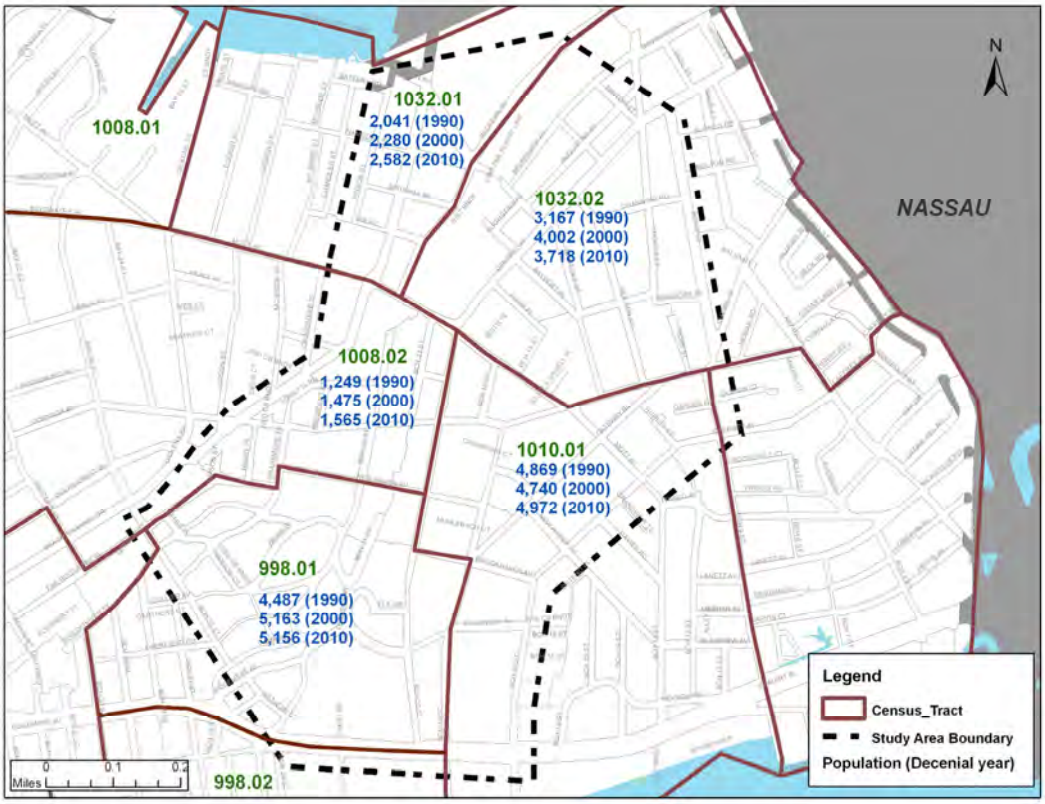
2.1 Introduction

The demographic and socioeconomic analyses of the study area focused on population changes and socioeconomic characteristics (household size, income, and car ownership) to determine trends and help identify future travel needs. The demographic analysis relied on data from New York City Department of City Planning (NYCDCP), and data compiled by the United States Department of Commerce – Bureau of Census for the years 1990, 2000 and 2010. To provide a context for the study area, comparisons were made with the borough and the City, where applicable.

The study area lies in Queens Community Districts 14 and consists of five Census Tracts (998.00, 1008.00, 1010.01, 1032.01, and 1032.02). In 2010 census tracts 998.00 and 1008.00 were subdivided into tracts (998.01 and 998.02) and (1008.01 and 1008.02), respectively. As shown in Figure 2-1, all census tracts in the study area are only partially located therein.

1990 Census tract data was not available for all the socio-economic variables studies under the demographic analysis for the study area, therefore data and trends observed for Queens and New York City during this decade were applied in some cases to estimate the study area characteristics for 1990.

Figure 2-1: Study Area Census Tracts



2.2 Population Trends

The study area population in 1990, 2000, and 2010 was approximately 15,813, 17,660, and 17,993 respectively representing a growth average of 14% over the 20-year period. The city and the borough recorded similar growths with approximately 12% in New York City and 14% in Queens over the same period. Table 2-1 provides more details.

Table 2-1: Population by Area

Census Year	New York City	% Change	Queens	% Change	Study Area	% Change
1990	7,322,564	-	1,951,598	-	15,813	-
2000	8,008,278	9.4	2,229,379	14.2	17,660	11.7
2010	8,175,133	2.1	2,230,722	0.1	17,993	1.9

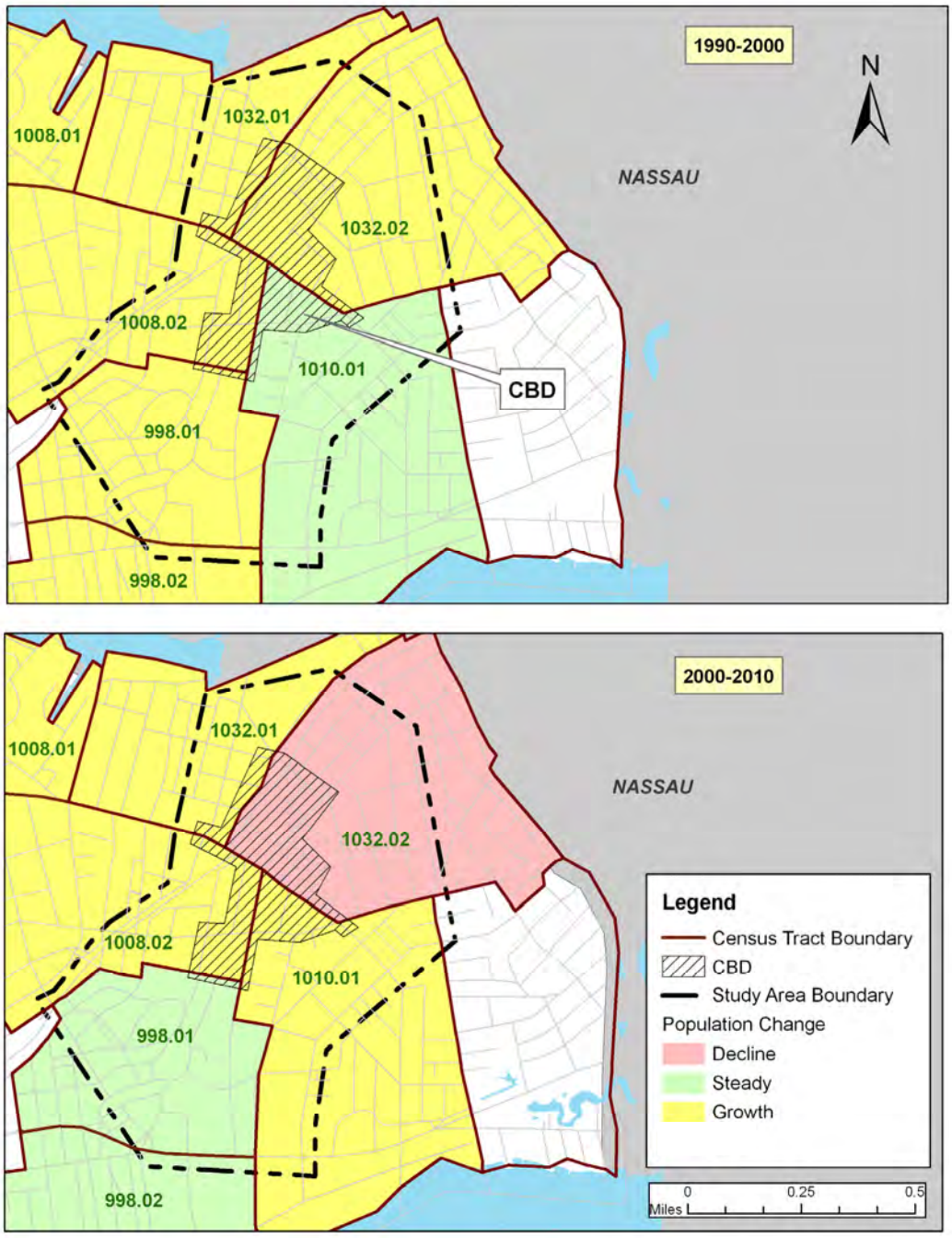
The population density in 2010 for the study area (0.61 sq. mi.) was 29,496 persons per square mile (p/sq ml) compared to 21,116 p/sq ml for Queens and 27,243 p/sq ml for New York City.

Four census tracts exhibited growth between 1990 and 2000 while one declined. Between 2000 and 2010 one tract showed no growth, three grew between 5% and 13% and one declined by 7%. Over the 20-year period (1990-2010) the study area's population grew by almost 14% gaining about 2,180 people.

Table 2-2: Study Area Population by Census Tracts (1990-2010)

Census Tract	%Tract in Study Area	1990 Population	2000 Population	% Change 1990-2000	2010 Population	% Change 2000-2010	% Change 1990-2010
998.00 (998.01&998.02)	40%	4,487	5,163	**15.1%**	5,156	**-0.1%**	**14.9%**
1008.00 (1008.01&1008.02)	15%	1,249	1,475	**18.2%**	1,565	**6.1%**	**25.3%**
1010.01	50%	4,869	4,740	**-2.6%**	4,972	**4.9%**	**2.1%**
1032.01	40%	2,041	2,280	**11.7%**	2,582	**13.2%**	**26.5%**
1032.02	60%	3,167	4,002	**26.4%**	3,718	**-7.1%**	**17.4%**
Total Population		15,813	17,660	**11.7%**	17,993	**1.9%**	**13.8%**

Figure 2-2: Population Change (1990-2010)



2.3 Household Characteristics

In 2010 the study area had approximately 5,882 households with an average size of 3.0 (a constant from 1990 to 2010). The number of households in the study area increased by 7% between 1990 and 2000 (from 5,270 to 5,640), and by 4.3% between 2000 and 2010 to 5,882. The number of households in Queens and New York City also increased similarly between 1990 and 2000. However, between 2000 and 2010, the number of households in Queens remained constant but increased in New York City by 2.9. In 2010 the study area's median household income was $39,117. On average 46% of households owned one or more vehicles. Tables 2-3 to 2-5 provide additional details about the study area demographic and socioeconomic characteristics.

Table 2-3: Study Area Demographic/Socio-Economic Data

Year	Population	# of Households	Household Size	Median Household Income	Household with vehicles
1990	15,813	5,270	2.78	$31,195	2,607
2000	17,660 *(+11.7%)*	5,640 *(+7%)*	2.90	$30,435 *(-2.4%)*	2,790 *(+7%)*
2010	17,993 *(+1.9%)*	5,882 *(+4.3%)*	3.00	$39,117 *(+28.5%)*	2,740 *(-1.8%)*

(+/-) represents percentage change from previous decade to specified decade

Table 2-4: Queens Demographics/Socio-Economic Data

Year	Population	# of Households	Household Size	Median Household Income	Household with vehicles
1990	1,951,598	718,377	2.68	$45,041	456,447
2000	2,229,379 *(+14.2%)*	782,664 *(+8.9%)*	2.81	$43,020 *(-4.5%)*	487,615 *(+6.8%)*
2010	2,230,722 *(+0.1%)*	780,117 *(-0.3%)*	2.82	$55,291 *(+28.5%)*	492,893 *(+1.1%)*

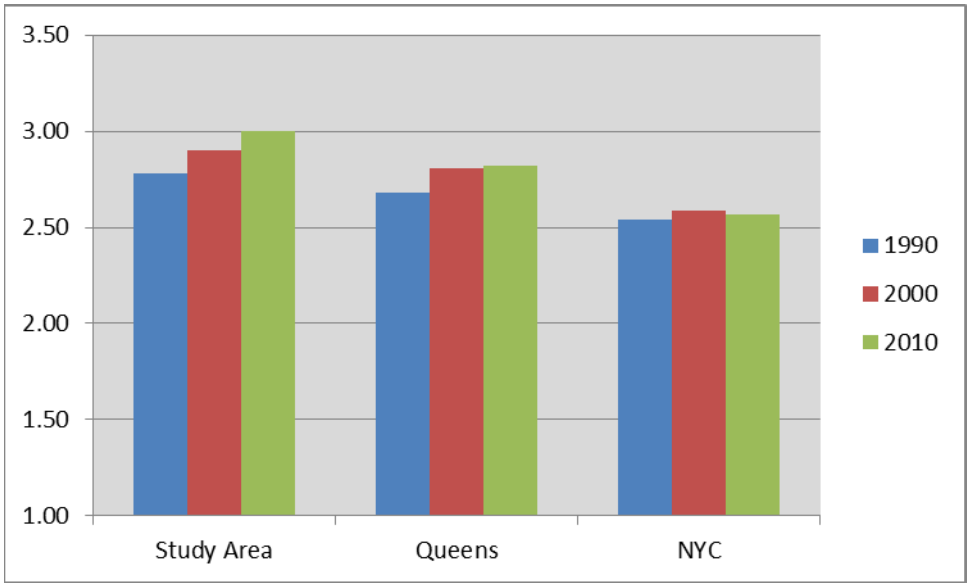
Table 2-5: New York City Demographics/Socio-Economic Data

Year	Population	# of Households	Household Size	Median Household Income	Household with vehicles
1990	7,322,564	2,819,401	2.54	$39,292	1,244,184
2000	8,008,278 *(+9.4%)*	3,021,588 *(+7.2%)*	2.59	$38,519 *(-2.0%)*	1,338,642 *(+7.6)*
2010	8,175,133 *(+2.1%)*	3,109,784 *(+2.9%)*	2.57	$50,285 *(+30.5%)*	1,382,873 *(+3.3)*

Household Size (HHS)

The chart below, Figure 2-3, shows the average household size by area. The household size did not change significantly in the study area, Queens, nor the City, but the change was most apparent in the study area

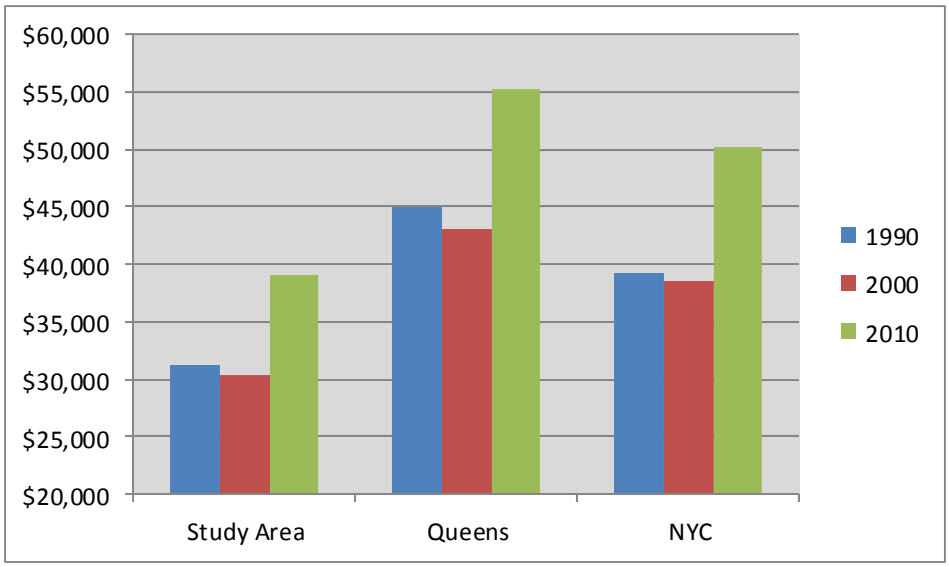
Figure 2-3: Household Size



Median Household Income

In 1990 the study area's median household income was approximately $31,195, compared to $45,041 for Queens and $39,292 for New York City (see Figure 2-4). This income differential continued over the next two decades. Not taking inflation into account, between 1990 and 2000 incomes in New York City, Queens and the study area decreased by 2%, 4.5% and 2.4%, respectively. Between 2000 and 2010 New York City, Queens and the study area median household income increased approximately 30%.

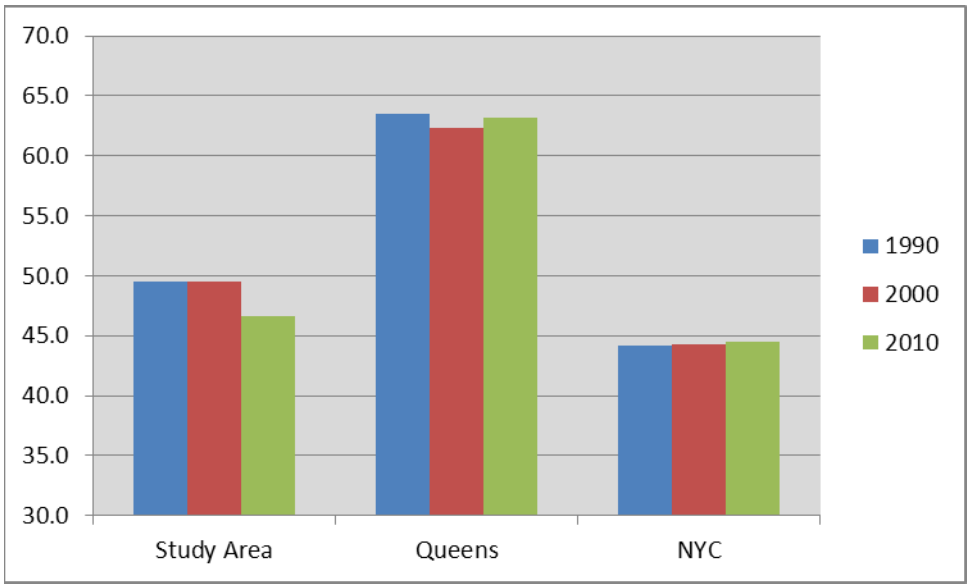
Figure 2-4: Median Household Income



Vehicle Ownership

Census data (1990-2000) shows that about 50% of households in the study area own one or more vehicles. By 2010 the number of households with vehicles decreased by 4%. However, the percentage of households with one or more vehicles in Queens and New York City remained relatively constant over the two decades at 62% and 44%, respectively.

Figure 2-5: % of Households with Vehicles



2.4 Journey to Work

The mode by which residents travel to work was examined for 1990, 2000 and 2010. Tables 2-6a to c provide details on journey to work by mode. However, data for 1990 was not available for the study area, and was therefore assumed to be similar to Queens.

The 1990 journey to work data clearly shows public transportation as the predominant mode of travel for New York City and Queens. Public transit represented 54.5% and 48.4% of work trips for New York City and Queens, respectively. Subway trips represented 37.6% and 35.1% of the total trips for New York City and Queens, respectively. Automobile share was 24.6% drive alone and 8.7% carpool (33.4%) for New York City. In Queens automobile share was approximately 44.9% with 34.3% drive alone and 10.6% carpool. In 1990, walk trips were 10.9% and 6.1% for New York City and Queens, respectively.

Table 2-6a: 1990 Journey to Work by Mode

Mode	New York City	Mode Share	Queens	Mode Share
Car, truck, or van:				
Drove alone	765,151	24.6%	309,990	34.3%
Carpooled	271,503	8.7%	95,940	10.6%
Total	**1,0.36,654**	**33.4%**	**405,930**	**44.9%**
Public transportation				
Bus	403,477	13.0%	92,732	10.3%
Subway	1,168,346	37.6%	317,421	35.1%
Railroad	54,716	1.8%	21,260	2.4%
Ferry	16,610	0.5%	94	0.0%
Taxicab	50,096	1.6%	5,237	0.6%
Total	**1,693,254**	**54.5%**	**436,744**	**48.4%**
Other Modes				
Motorcycle	1,711	0.1%	415	0.0%
Bicycle	9,643	0.3%	1,531	0.2%
Walked	340,077	10.9%	54,646	6.1%
Other means	24,930	0.8%	3,767	0.4%
Total	**376,361**	**12.1%**	**60,359**	**6.7%**
Total Trips	**3,106269**	**100%**	**903,033**	**100%**

The 2000 journey to work mode share was similar to 1990 with public transit as the predominant mode in New York City and Queens with 54.2% and 48.2%, respectively. However, the study area's predominant mode was automobile with 46.6% of the total trips (35.6% drive alone and 11% carpool). This was followed by public transit with a 44.2% share. Subway trips for journey to work are higher than bus trips with approximately 38.7%, 35% and 21% in New York City, Queens, and the study area. Buses represent 18.7% in New York City, 11.8% in Queens and 10.2% in the study area. Among the other modes, walking represent 8.2% in the study area, 5.8% in Queens and 10.7% in New York City. Table 2-6b provides additional details.

Table 2-6b: 2000 Journey to Work by Mode

Mode	New York City	Mode Share	Queens	Mode Share	Study Area	Mode Share
Car, truck, or van:						
Drove alone	794,422	25.6%	319,187	34.9%	2,015	35.6%
Carpooled	254,974	8.2%	95,329	10.4%	622	11.0%
Total	**1,049,396**	**33.9%**	**414,516**	**45.3%**	**2,637**	**46.6%**
Public transportation						
Bus	364,408	11.8%	93,186	10.2%	1,055	18.7%
Subway	1,199,226	38.7%	320,768	35.0%	1,188	21.0%
Railroad	51,141	1.6%	20,845	2.3%	183	3.2%
Ferry	11,193	0.4%	143	0.0%	11	0.2%
Taxicab	53,781	1.7%	6,235	0.7%	58	1.0%
Total	**1,679,749**	**54.2%**	**441,177**	**48.2%**	**2,496**	**44.2%**
Other Modes						
Motorcycle	1,488	0.0%	384	0.0%	1	0.0%
Bicycle	15,024	0.5%	2,417	0.3%	21	0.4%
Walked	332,264	10.7%	52,776	5.8%	466	8.2%
Other means	21,998	0.7%	3,766	0.4%	29	0.5%
Total	**370,774**	**12.0%**	**59,343**	**6.5%**	**518**	**9.2%**
Total Trips	**3,099,919**	**100%**	**915,036**	**100%**	**5,651**	**100%**

In 2010 the study area's primary journey to work mode was auto with a 41.1% share (drive alone and carpool). This was followed by bus (20.5%), subway (18%), and walk only (13.2%). In New York City and Queens, public transit (subway) was the predominant mode with 42% and 37.9%, respectively; followed by automobile (drive alone and carpool) with 29.6% and 40.6%, respectively.

From 2000 to 2010 the study area's journey to work public transit share decreased by 2% and was lower than both Queens and New York City. The auto share decreased also by approximately 5%. In 2010 walk mode represented 13.2% in the study area, 5.8% in Queens, and 10.6% in New York City.

Table 2-6c: 2010 Journey to Work by Mode

Mode	New York City	Mode Share	Queens	Mode Share	Study Area	Mode Share
Car, truck, or van:						
Drove alone	836,940	24.0%	331,389	33.1%	2,005	32.1%
Carpooled	197,014	5.6%	75,643	7.5%	561	9.0%
Total	**1,033,954**	**29.6%**	**407,032**	**40.6%**	**2,566**	**41.1%**
Public transportation						
Bus	451,624	12.9%	117,150	11.7%	1,283	20.5%
Subway	1,465,999	42.0%	379,475	37.9%	1,126	18.0%
Railroad	69,825	2.0%	26,538	2.6%	240	3.8%
Ferry	8,586	0.2%	181	0.0%	0	0.0%
Taxicab	42,723	1.2%	4,422	0.4%	28*	0.5%
Total	**2,038,757**	**58.4%**	**527,766**	**52.7%**	**2,676**	**42.8%**
Other Modes						
Motorcycle	2,334	0.1%	514	0.1%	**	0.0%
Bicycle	23,986	0.7%	3,889	0.4%	128	2.0%
Walked	370,517	10.6%	58,104	5.8%	827	13.2%
Other means	19,384	0.6%	4,719	0.5%	56	0.9%
Total	**416,221**	**11.9%**	**67,226**	**6.7%**	**1,011**	**16.1%**
Total Trips	**3,488,932**	**100%**	**1,002,024**	**100%**	**6,253**	**100%**

** No of Motorcycle is included in other means for the study area: Data from ACS 2006-2010

3 Zoning and Land Use

3.1 Introduction

The existing zoning and land use in the study area was examined to determine its impact on trip characteristics, pedestrian density and traffic congestion. Different land uses have different trip generating characteristics and depending on their spatial distribution influence travel behavior. Field surveys were conducted to document the existing land use in addition to DCP Zoning & Land Use application map and NYC Zoning resolution.

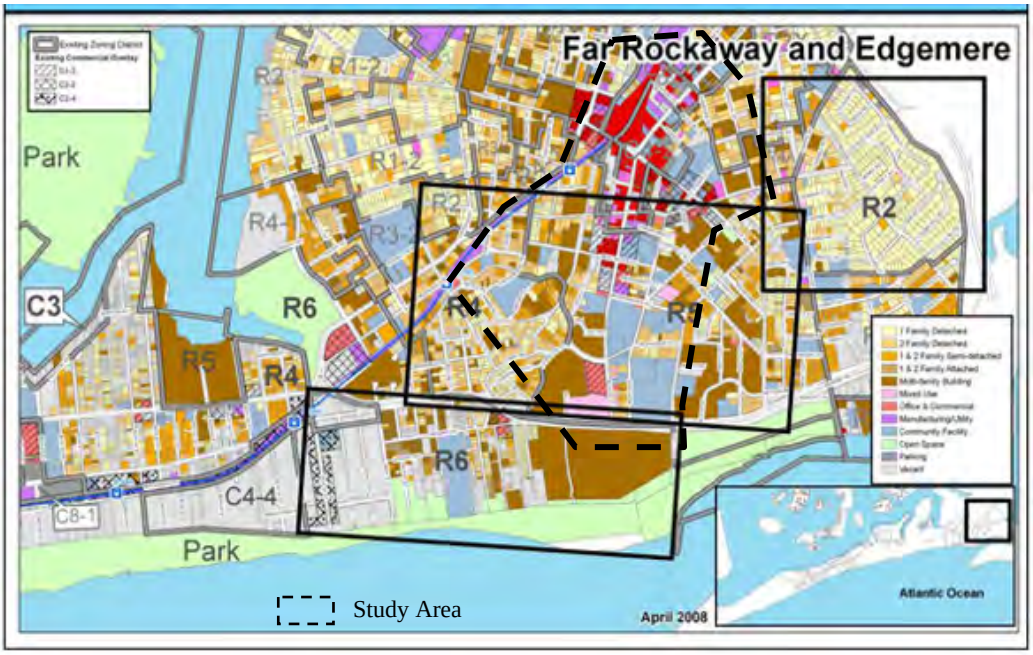
3.2 Zoning

The three basic zoning districts in New York City are residential (R), commercial (C) and manufacturing (M), as outlined in the NYCDCP Zoning Handbook (2006). These are further subdivided to permit low, medium and high density developments which are governed by permitted coverage and floor area ratios. Development within these districts is regulated by zoning resolutions that governs use, building size and parking.

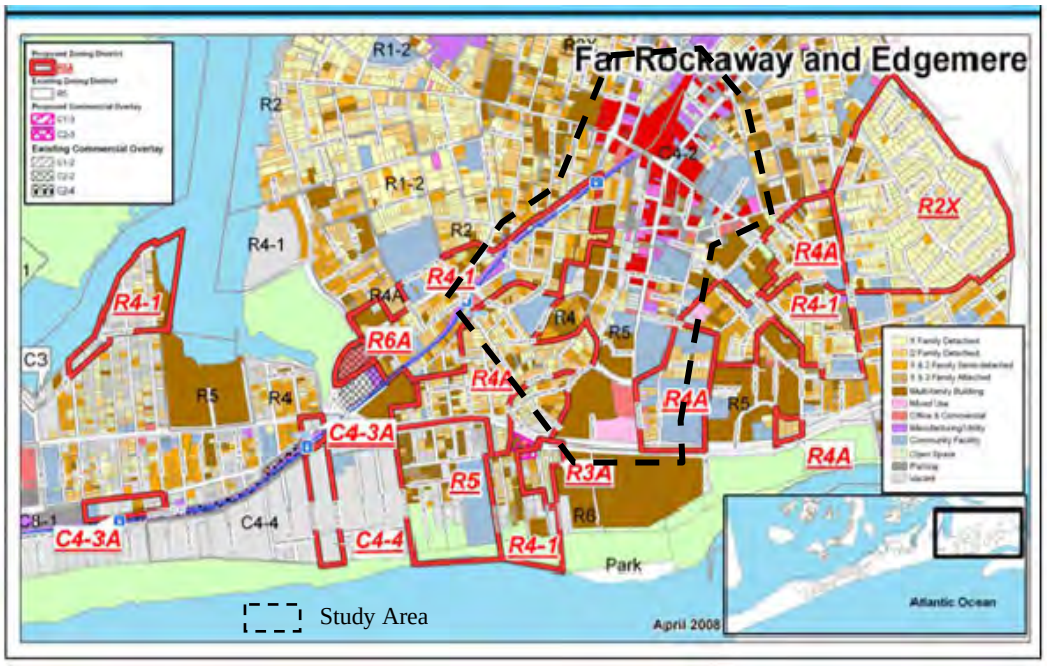
In 2008 the study area was rezoned with the City Council adopting the Rockaway Neighborhoods Rezoning plan for 280 blocks on the Rockaway Peninsula. The rezoning aimed to reinforce the special character of the five Rockaway neighborhoods (Rockaway Park, Rockaway Beach, Somerville, Edgemere and Far Rockaway) by protecting the low-scale distinctive housing stock and making provision for moderate retail and housing opportunities near transit. It also established new regulations to address parking demand generated by new development and facilitating a mix of residential and commercial activities. Figure 3-1 shows the original and re-zoned districts under the plan.

The zoning plan built upon previous contextual zoning changes in the Rockaway Park community approved in November 1989, the Far Rockaway/Mott Creek community approved in September 2005, and the Bayswater neighborhood approved in April 2006.

Figure 3-1: 2008 Rockaway Neighborhood Rezoning



(Zoning Prior to 2008)



(2008 Zoning)

Source: NYC Department of City Planning website

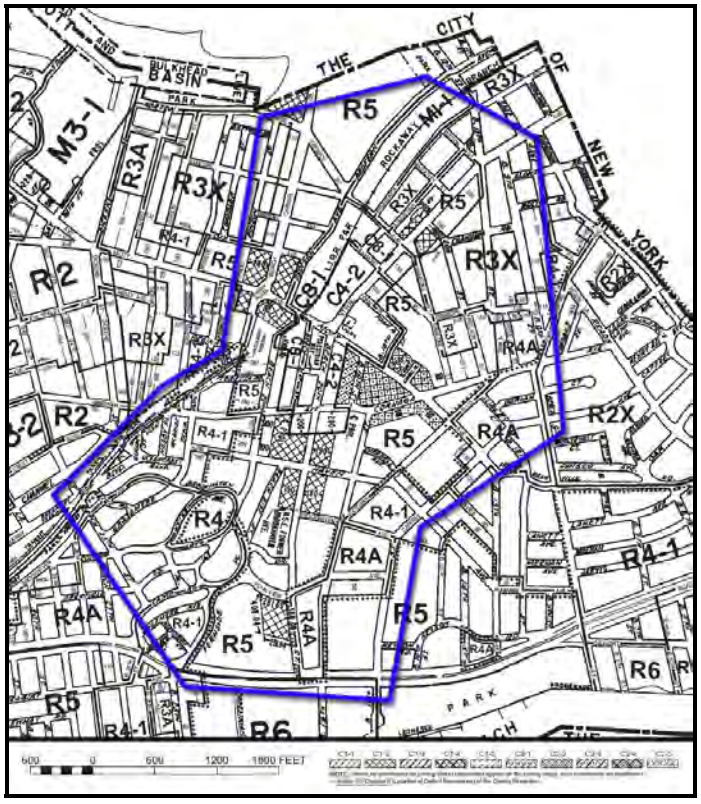
Study Area Zoning Districts

There are five types of residential zoning districts (R3X, R4, R4-1, R4A, and R5), four commercial zoning districts (C1-2, C2-2 C4-2, and C-8-1) and one manufacturing zoning district (M1-1) within the study area. Table 3-1 shows the zoning designations and the percentage distribution in the study area while Figure 3-2 shows the zoning map.

Table 3-1: Zoning Districts within the Study Area

District	Zoning	FAR *(floor area ratio)*	Area Percentage
Residential	R3X	0.5	10%
	R4 to R4-A	0.75	20%
	R5	1.25	30%
Commercial	C1-2 to C2-2 & C8-1	1.0	25%
	C4-2	3.4	10%
Manufacturing	M1-1	1.0	5%

Figure 3-2: Study Area Zoning Map

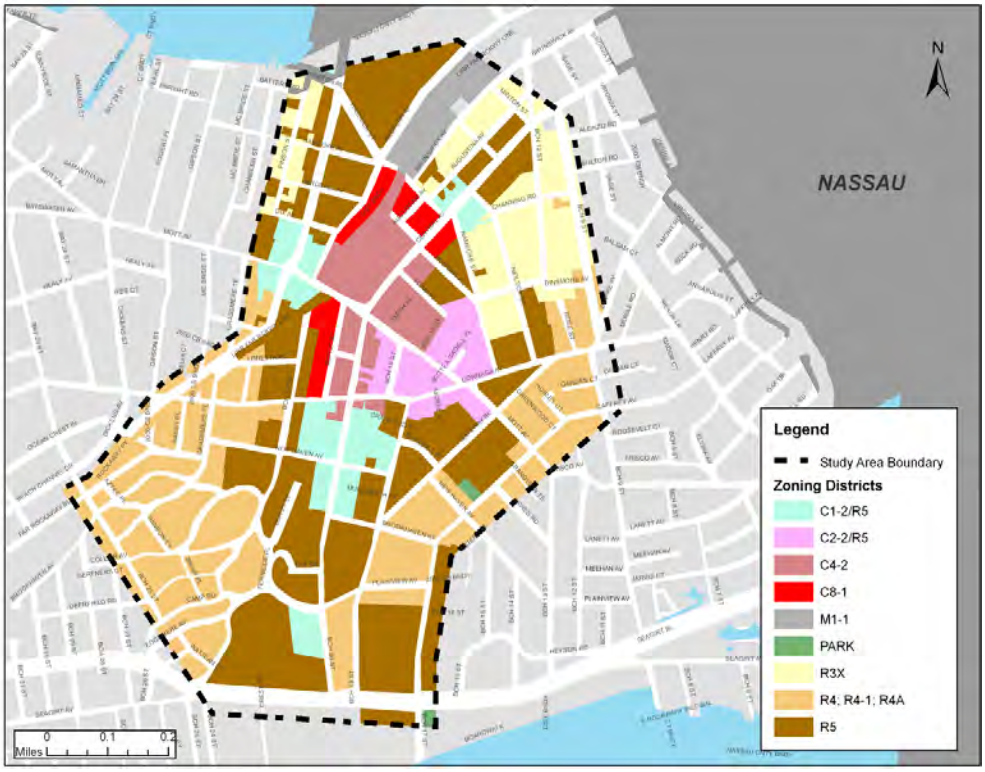


Residential Zoning Districts

The study area is predominantly zoned for residential use which account for approximately 60% of the total area. Figure 3-3 shows the existing zoning within the study area.

The five residential districts in the study area (R3X, R4, R4-1, R4A, and R5) accommodate relatively lower-density development; however, the R5 district permits higher density multifamily elevator buildings. The R3X which permits only one and two family detached homes are located mainly in the north-east section of the study area and a small portion in the north-west along Pinson Street. R4 to R4A districts are concentrated south of Gateway Boulevard, east of Beach 19th Street and west of Beach 22nd Street/Edgemere Avenue. Like the R3 district, the R4 district permits only one and two family detached and semi-detached units but with a higher floor area ratio, resulting in larger homes. The R5 district permits a variety of housing types at higher densities than R3 and R4 districts. They are primarily located in areas surrounding the main commercial districts and along arterials such as Beach Channel Drive, Beach 22nd Street, Beach 19th Street and west of Redfern Avenue.

Figure 3-3: Study Area Existing Zoning



Commercial Zoning Districts

There are only two types of commercial districts (C4-2 and C8-1) and two commercial overlays (C1-2 and C2-2) mapped in the study area, accounting for approximately 35% of the total area. They are located mainly along Mott Avenue, Central Avenue/Beach 20th Street and on a portion of Cornaga Avenue between Beach 20th Street and Mott Avenue.

The C4-2 district is mapped north of Mott Avenue between Redfern Avenue and Beach 18th Street and on both side of Central Avenue/Beach 20th Street from Bayport Place to Cornaga Avenue. This district includes the shopping center, the library, Chase Bank and the pedestrian plaza on Beach 20th Street.

There are five distinct locations where C8-1 districts are mapped. One C8-1 district can be found west of Beach 21st Street between Mott and Cornaga Avenues where the bus terminal and municipal parking lot are. Another exists along the east side of Beach Channel Drive

between Dix and Nameoke Avenues, north of Bayport Place. These districts serve as a bridge between commercial and manufacturing uses.

The C1-2 and C2-2 commercial overlays are mapped just outside the boundaries of C4-2 district where some of the (R5) residential districts are located. They permit commercial activities such as grocery stores, restaurants and repair services. The C1-2/R5 districts are found near the intersections of Beach Channel Drive and Mott Avenue, and Beach 20th Street and New Heaven Avenue. The C2-2/R5 district is mapped on Mott and Cornaga Avenues between Beach 19th Street and Gateway Boulevard.

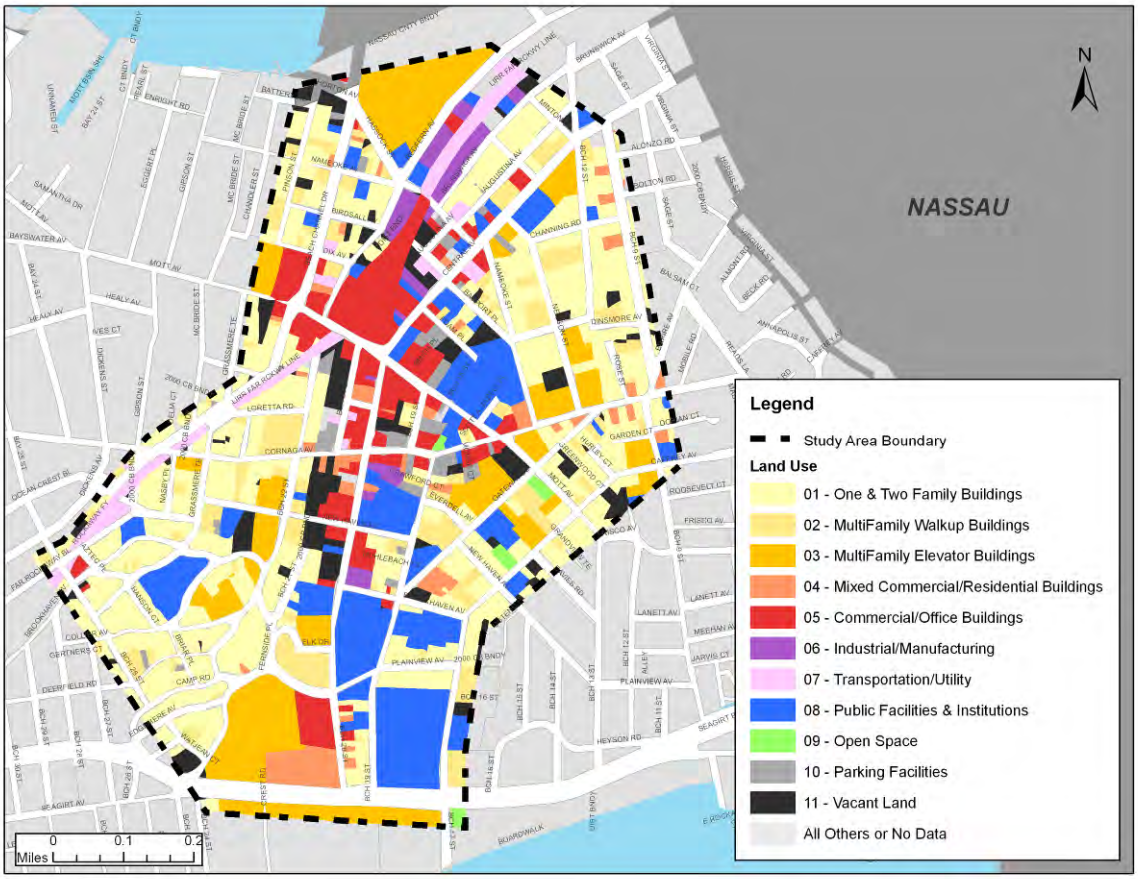
Manufacturing Zoning Districts

There is a M1-1 manufacturing district mapped north of Nameoke Avenue between Redfern and Brunswick Avenues where the LIRR Far Rockaway station is located. This district permits light industry such as woodworking shops, auto storage and repair shops, and wholesale service and storage facilities. The manufacturing district represents approximately 5% of the study area.

3.3 Land Use

The zoning districts permit various types of uses and densities as reflected in the existing land uses. The existing land uses include one- and two-family homes, offices, retail establishments, educational institutions, banks, medical centers, bus/rail terminals and religious institutions amongst others. Figure 3-4 shows the existing land uses.

Figure 3-4: Existing Land Use



One- and two-family homes, multi-family walk-up and elevator buildings are the predominant residential land use in the study area. Most of the mixed residential/commercial uses are located along major commercial corridors such as Beach 20th Street and Cornaga Avenue where significant ground floor retail can be seen. Figure 3-5 shows typical residential buildings in the study area.

Figure 3-5: Typical 1 & 2 family residences and multifamily homes with commercial uses

Commercial uses can be found primarily along three corridors Mott Avenue, Central Avenue/Beach 20th Street and Cornaga Avenue. The commercial retail activities range from national fast food chains (McDonald's, Popeye's Chicken, White Castle, KFC and Subway) to 99 cents stores, banks (Chase and Capital One), coffee shops, a fish market, drug stores (Thriftway Far Rockaway), clothing and shoes store (VIM), restaurants, hair and nail salons, tax offices (H & R B lock), dry cleaners, check cashing stores (Western Union), and supermarkets (C-Town, Food Dynasty, Kosher World supermarket).

Several office buildings can be found along Central Avenue/Beach 20th Street and auto repair shops are generally dispersed throughout the study area. Field surveys revealed some vacant retail spaces in disrepair. Figure 3-6 shows commercial/retail uses in the study area.

Figure 3-6: Commercial Retail

Beach 20th St looking south

Shopping center at Mott Avenue & Beach 22nd St

Mott Avenue - looking west

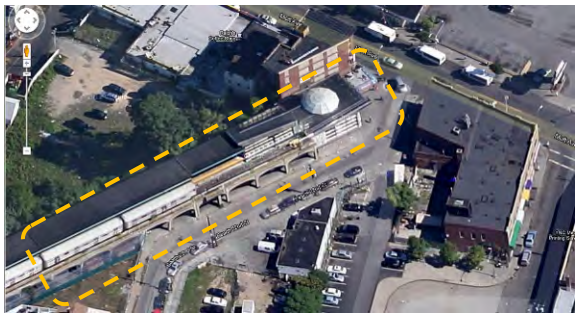
Mott Avenue looking from the Shopping Center

The Industrial/manufacturing uses are concentrated in the northern part of the study area along the LIRR Far Rockaway line and station, north of Nameoke Avenue between Redfern and Brunswick Avenues.

There are two general locations where transportation related uses are found. One is adjacent to the LIRR facilities and station and the other is New York City Transit elevated A train along Far Rockaway Freeway/Beach Channel Drive to Mott Avenue station and terminal. During the study the A train was not fully operational due to damages caused by Super Storm Sandy. Figure 3-7 shows manufacturing and transportation related uses.

Figure 3-7: Manufacturing & Transportation related uses

Far Rockaway Station (LIRR)



Mott Avenue Station: A train

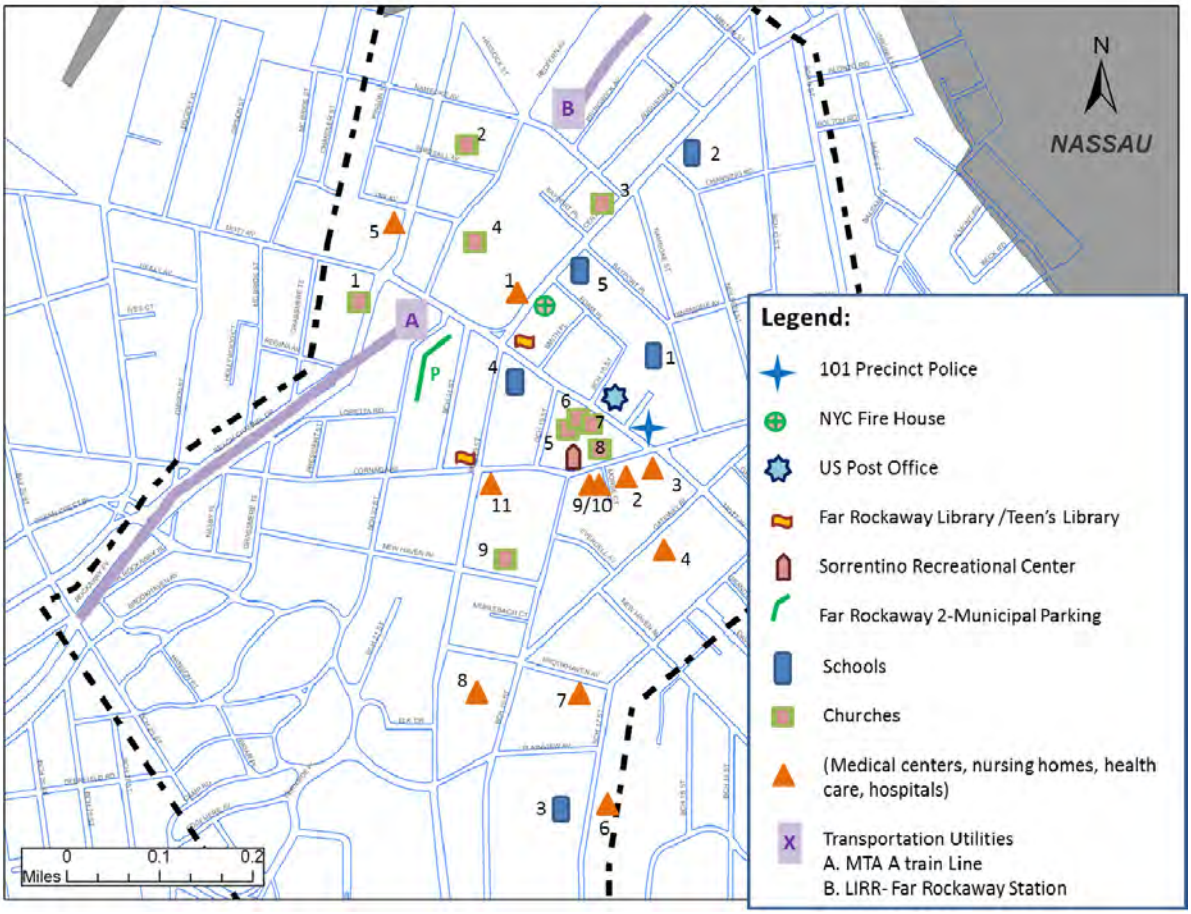
Institutional and community facilities in the study area are primarily located east of the Central Avenue/Beach 20th Street corridor. They include public and private schools PS 253, JHS/MS 53 Brian Picollo, Peninsula Prep Charter school, Talmud Torah Siach Yitzchok, the Jewish College of Beis Medrash Heichal Dovid and the Global Business institute among others.

There are medical centers, nursing homes and adult health care facilitates such as Tate Medical Center, CNR Health Care Network, Beth Abraham adult day care, the Haven Manor, Rockaway mental health clinic, Brookhaven Rehabilitation Health care center and Bishop Charles Waldo Maclean Episcopal nursing home. The sole hospital in the study area, St John's Episcopal Hospital, is located between Beach 19th and Beach 20th Streets on Brookhaven Avenue. There is also the Central Veterinarian Associates and the Rockaway Animal Hospital on Cornaga Avenue.

The 101st Precinct and the US Post Office is located next to each other on Mott Avenue between Foam Place and Cornaga Avenue. The FDNY (Fire House) is located on Central Avenue north of Mott Avenue next to the Queens Far Rockaway Public Library. Other institutional facilities are the Teen's Library at Cornaga Avenue and Beach 20th Street and the Sorrentino Recreational Center on Cornaga Avenue and Beach 19th Street. Additionally, there are churches, chapels and synagogues dispersed throughtout the study area, the largest being St Mary's Star of the Sea located on New Haven Avenue between Beach 19th and Beach 20th Streets. See Figure 3-8.

Off-street parking facilities in the study area are generally associated with commercial and institutional uses such as banks, hospitals, retail stores, schools, community centers, etc. However, there is a municipal parking lot located between Beach 21st and Beach 22nd Streets close to Mott Avenue. There are no recreational or open spaces in the study area, except the beach/boardwalk which is located approximately half mile to the south.

Figure 3-8: Community Facilities



(Medical Facilities)

1. Tate Medical center
2. CNR Health Care Network
3. Beth Abraham Adult day care
4. The Haven Manor
5. Rockaway Mental Health clinic
6. Brookhaven Rehabilitation & Health Center
7. Bishop Charles Waldo Maclean
8. St John's Episcopal Hospital
9. Central Veterinarian Associates center
10. Rockaway Animal Hospital
11. New Horizon Counseling Center

(Religious Institutions)

1. Evangelical Holiness Church
2. Far Rockaway Church of Christ
3. Community Church The Nazarene
4. Living Rock Ministries
5. The United Methodist Center
6. Refuge Church Of Christ
7. Prince of Peace Pentecostal
8. God's Pentecostal Church
9. St Mary's Start of the Sea

(Schools)

1. MS 53 / Peninsula Prep Charter school
2. PS 253
3. Beis Medras Heichal Dovis School
4. Global Business Institute
5. Talmud Torah Siach Yitzchok

4 Traffic and Transportation

The study area which is located in the eastern part of the Rockaway peninsula borders the Nassau County line, and is near the John F. Kennedy International Airport and the Nassau Expressway (I-878). The peninsula and study area can be accessed from Cross Bay Boulevard, Flatbush Avenue, Rockaway Turnpike and the Nassau Expressway (I-878). Although there is no direct connection to any of the regional highways, the CBD is within a half mile of the Nassau Expressway. Figure 4-1 shows the study area and regional facilitates. The traffic analysis focused on the main commercial corridors in and around the Far Rockaway Central Business District.

In general, growth in destination traffic to the area has slowed due to the economic decline and closure of many stores in the Far Rockaway Shopping Center. However, because the area's main corridors connect to regional facilities (I-878, Seagirt Boulevard, Rockaway Turnpike, Rockaway Freeway, Beach Channel Drive, and Central Avenue) facilitating regional traveling, there is significant through traffic that contributes to congestion.

Figure 4-1: Regional Access to the Study Area

4.1 Street System and Roadway Characteristics

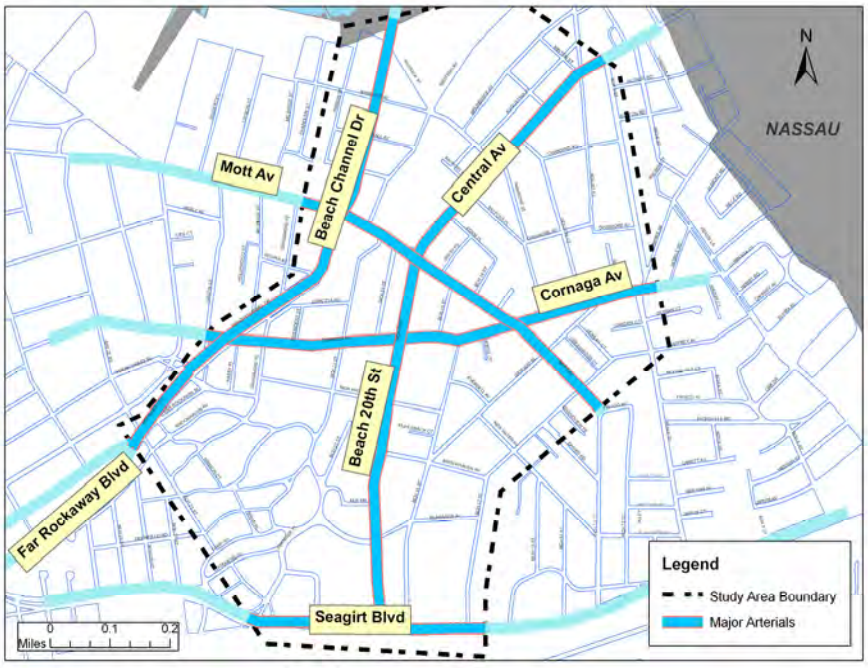
The area's street network is a hybrid of a grid and a radial system, thus creating many T-intersections and limited "through streets" forcing traffic to concentrate on the few through routes such as Cornaga Avenue, Mott Avenue, Central Avenue/Beach 20th Street and Beach Channel Drive.

East/West Corridors

Mott Avenue is the main east/west corridor and it divides the study area into north and south. The A-Train ends at Mott Avenue between Beach 22nd Street and Beach 21th Street with the bus terminus forming a major transit hub where many vehicular and bus trips begin and end.

Mott Avenue is approximately 41 feet wide between Beach Channel Drive and Cornaga Avenue. It operates as two moving lanes eastbound between Beach 22nd and Beach 21st Streets and one lane with parking on the south curb for the remainder of the corridor. Westbound, it operates as two moving lanes between Central Avenue and Beach Channel Drive and as one lane with parking on the north curb between Central and Cornaga Avenues. The corridor is predominately commercial in nature with offices, community buildings, retail stores, banks, restaurants and fast food chains (McDonalds and Subway).

Figure 4-2: Study Area Major Arterials



In addition to automobile and pedestrians using the corridor to access the various land uses, NYCT and NICE buses as well as other private buses traverse the corridor dropping off and picking up passengers at the Mott Avenue intermodal hub. This activity peaks between 6:30-8:30AM and 4:00-6:00PM.

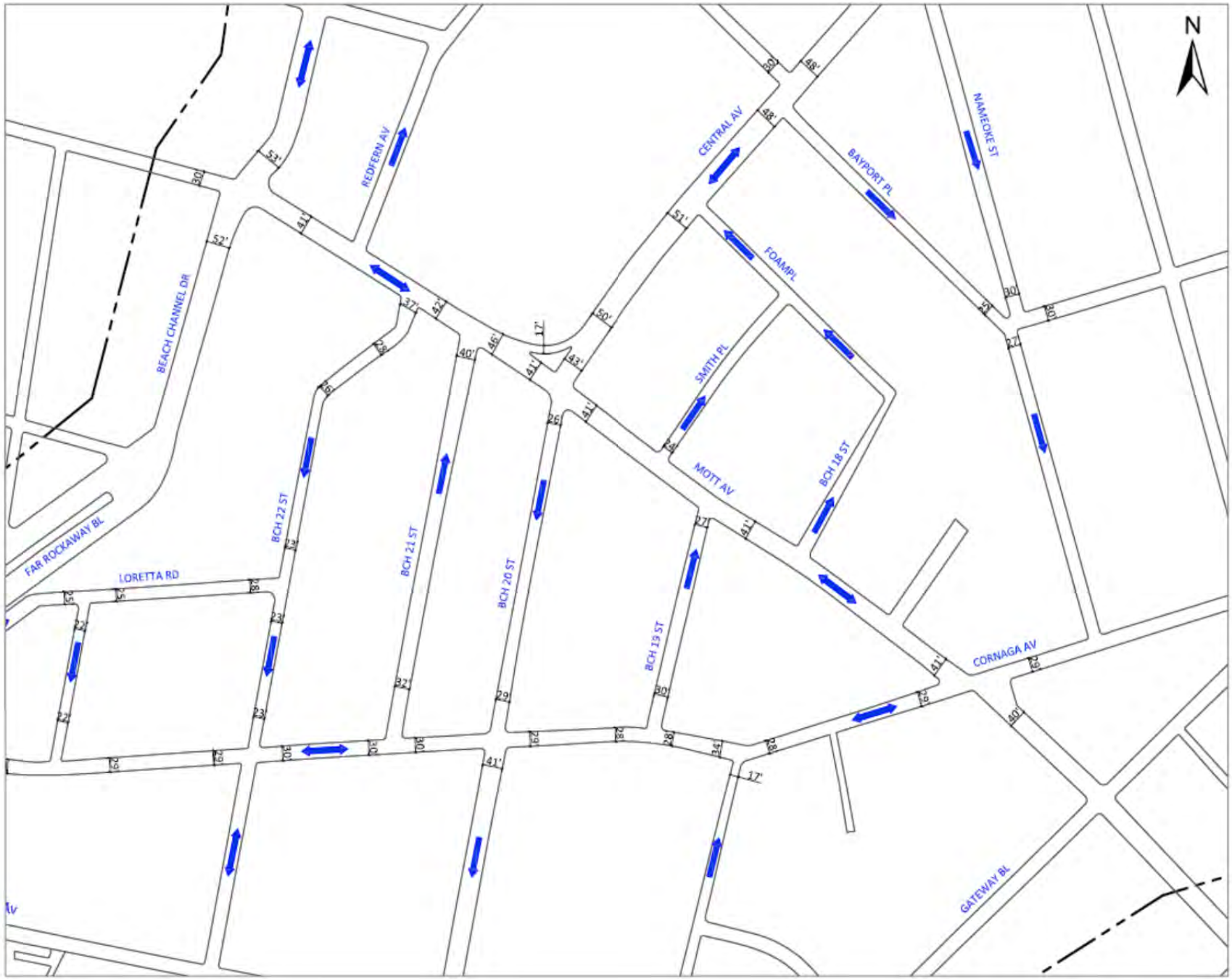
Cornaga Avenue operates as a two way east-west corridor. It is approximately 29 feet wide between Rockaway Freeway/Beach Channel Drive and Mott Avenue. In some segments it operates as one effective moving lane and in others as two moving lanes. Between Far Rockaway Freeway/Beach Channel Drive and Mott Avenue it operates as one moving lane eastbound, while westbound between Beach 21st Street and Mott Avenue it has an 18 foot wide lane with no parking. Between Beach 21st Street and Far Rockaway Freeway/Beach Channel Drive it operates as one travel lane with parking. The land use on the corridor is mix residential/commercial, auto repair shops, parking lots and other establishments.

North/South Corridors

Beach Channel Drive which runs north-south forms the western boundary of the study area. It is approximately 50-55 feet wide with two moving lanes (one thru-right and one left turn lane on most approaches). It has a bike lane from Cornaga Avenue to Mott Avenue. Between Mott Avenue and Hassock St/Horton Avenue it operates as one moving lane, a bike lane and one parking lane in each direction. The land use along the corridor is predominately residential south of Mott Avenue; however, north of Mott Avenue it has mixed residential and commercial uses. It is the only through truck route in the study area.

Beach 20th Street/Central Avenue another main north-south corridor runs from Seagirt Boulevard to Nassau Expressway (I878) in the study area. Central Avenue which starts north of Mott Avenue has one travel lane and one parking lane per direction. The curb to curb width varies between 43 and 50 feet. South of Mott Avenue, Central Avenue becomes Beach 20th Street and operates one-way southbound. The width between Mott and New Haven Avenues varies between 25 and 40 feet, and operates as two moving lanes with parking on both curbs where the width permits. See Figure 4-3 for street widths and street directions.

Figure 4-3: Street Width & Street Direction

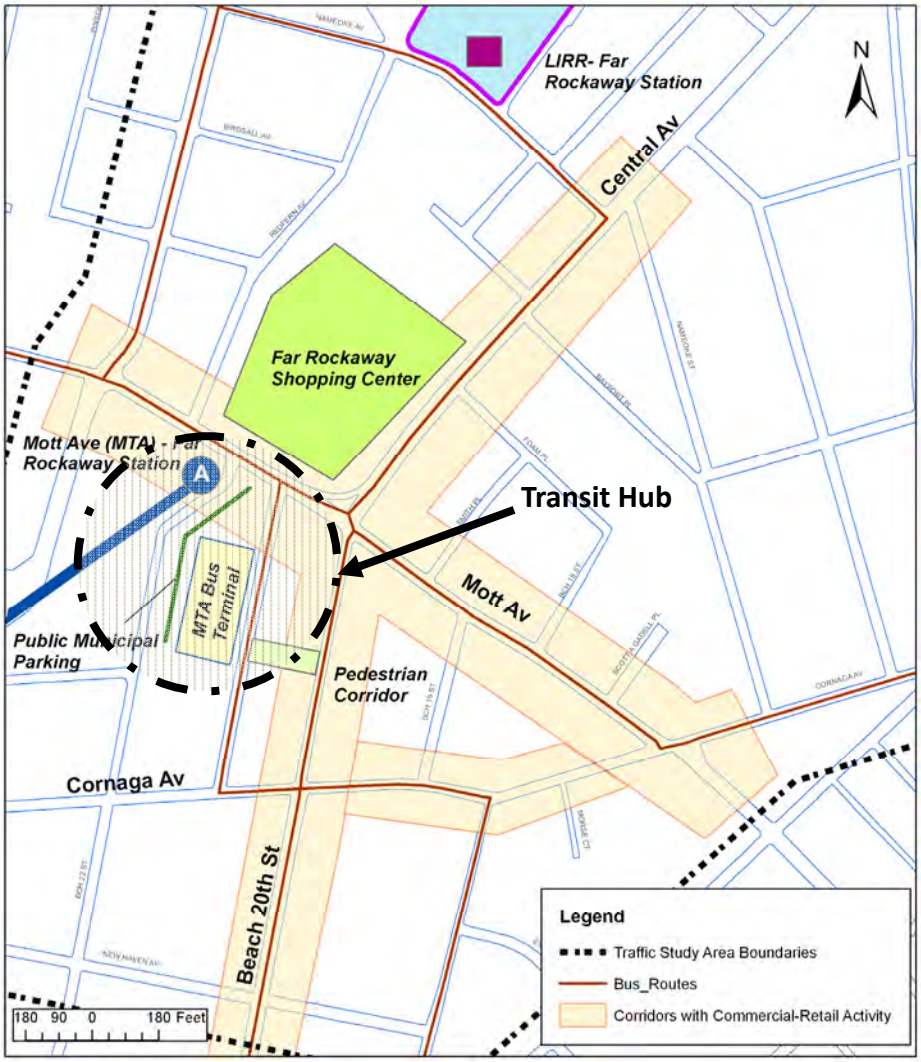


4.2 Trip Generators and the Transit Hub

There is a significant amount of destination trips to the area that compete with through trips accessing the Nassau Expressway (I-878) and other regional facilitates. In the center of the study area is the transit hub and other major trip generators such as the shopping mall and other local retail/commercial activities.

In general, most of the peak periods' through trips are concentrated along Beach Channel Drive, Seagirt Boulevard, and Central Avenue. The shopping trips occur mostly during the midday peak and weekends. Figure 4-4 shows the commercial core and transportation facilities.

Figure 4-4: Commercial Corridors



4.3 Traffic Data Collection

The existing traffic conditions were determined from field surveys conducted in April 2012. Traffic volume counts were conducted using ATR machines, and manual turning movement and vehicle classification counts. The counts were conducted during three weekday peak periods (7:00-9:00 AM and 4:00-6:00 PM) and during a Saturday peak (12:00-2:00 PM) in 15 minutes intervals. Manual turning movement and vehicle classification counts were conducted at the following 14 locations:

1. Beach Channel Drive @ Mott Avenue
2. Beach Channel Drive @ Hassock Street
3. Mott Avenue @ Beach 21st Street
4. Mott Avenue @ Beach 20th Street/Central Avenue
5. Mott Avenue @ Cornaga Avenue
6. Cornaga Avenue @ Gateway Blvd (Unsignalized)
7. Cornaga Avenue @ Beach 9th Street/Empire Avenue
8. Cornaga Avenue @ Beach 19th Street
9. Cornaga Avenue @ Beach 20th Street
10. Nameoke Street @ Dinsmore Avenue/Bayport Pl (Unsignalized)
11. Central Avenue @ Nameoke Avenue
12. Central Avenue @ Beach 12th/Minton Streets (Unsignalized)
13. Hassock Street @ Nameoke/Redfern Avenues (Unsignalized)
14. New Haven Avenue @ Beach 20th Street

Automatic Traffic Recorders (ATRs) were placed at the following 10 locations for one week to collect 24 hours traffic counts in 15-minute intervals.

1. Beach Channel Drive b/w Mott & Regina Avenues (NB/SB)
2. Beach Channel Drive b/w Nameoke Avenue & Hassock Street (NB/SB)
3. Mott Avenue b/w Beach Channel Drive & Redfern Avenue (EB/WB)
4. Mott Avenue b/w Beach 21st & Beach 20th Streets (EB/WB)
5. Mott Avenue b/w Cornaga Avenue & Gateway Blvd (EB/WB)

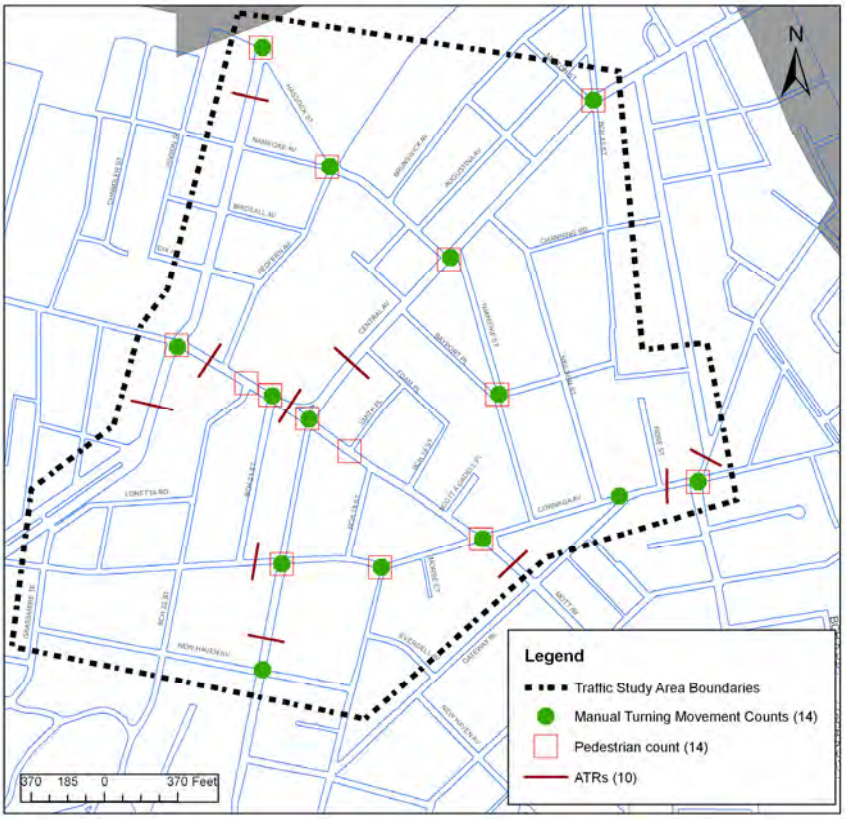
6. Cornaga Avenue b/w Beach 9th Street & Gateway Blvd (EB/WB)
7. Cornaga Avenue b/w Beach 20th & Beach 21st Streets (EB/WB)
8. Beach 9th Street b/w Empire & Cornaga Avenues (NB/SB)
9. Central Avenue b/w Mott Avenue & Foam Place (EB/WB)
10. Beach 20th Street b/w Cornaga and New Haven Avenues (SB)

There is significant pedestrian traffic in the study area due to the presence of the transit hub, regional and local retail, as well as institutional facilities. The following fourteen locations were identified for pedestrian counts during the weekday (7-9 AM and 4-6 PM) peaks and the Saturday midday peak 12-2 PM in 15-minutes intervals:

1. Beach Channel Drive @ Mott Avenue
2. Beach Channel Drive @ Hassock Street
3. Mott Avenue @ Beach 22th Street/Subway terminal
4. Mott Avenue @ Beach 21st Street
5. Mott Avenue @ Beach 20th Street/Central Avenue
6. Mott Avenue @ Cornaga Avenue
7. Mott Avenue @ Smith Place
8. Cornaga Avenue @ Beach 9th Street/Empire Avenue
9. Cornaga Avenue @ Beach 19th Street
10. Cornaga Avenue @ Beach 20th Street
11. Nameoke Street @ Dinsmore Avenue/Bayport Place
12. Central Avenue @ Nameoke Avenue
13. Central Avenue @ Beach 12th/Minton Streets
14. Hassock Street @ Nameoke/Redfern Avenues

The locations selected for vehicular capacity and pedestrian analysis were based on the functions of the corridors, land use, and the location of the transit hub. Figure 4-5 shows the data collection plan with ATRs, manual turning movement counts (MTMC) and pedestrian count locations.

Figure 4-5: Traffic Data Collection Plan



4.4 Network Traffic Volumes

Balanced traffic networks for the various peak hours were prepared using the ATRs and manual turning movement counts. The traffic volumes have been plotted on traffic flow maps for the AM (8:00-9:00), PM (4:30-5:30) and Saturday (12:15-1:15) peak hours. Figures 4-6, 4-7 and 4-8 show the 2012 existing peak hour traffic volumes. The traffic network volumes along the major corridors are as follows:

- *Mott Avenue* between Beach Channel Drive and Cornaga Avenue direction carries approximately 395, 409, and 416 vehicles eastbound during the AM, PM and Saturday peak hours, respectively. The westbound volumes are approximately 314, 425, and 321 vehicles during the AM, PM and Saturday peak hours, respectively.

- *Cornaga Avenue* between Beach 22nd Street and Mott Avenue carries approximately 203, 236, and 220 vehicles eastbound during the AM, PM and Saturday peak hours, respectively. The westbound volumes are higher with 346, 373, and 325 vehicles during the AM, PM and Saturday peak hours, respectively.

- *Beach Channel Drive* between Mott Avenue and Horton Av/Hassock Street processes between 552 and 611 vehicles northbound during the various peak hours. The southbound volume varies between 630 and 809 vehicles during the various peak hours.

- *Central Avenue/Beach 20th Street* north of Mott Avenue processes approximately 241, 260, and 212 vehicles northbound during the AM, PM and Saturday peak hours, respectively. The southbound volume is higher with approximately 512, 631, and 475 vehicles during the AM, PM, and Saturday peak hours, respectively.

Figure 4-6: AM Peak Hour Volumes

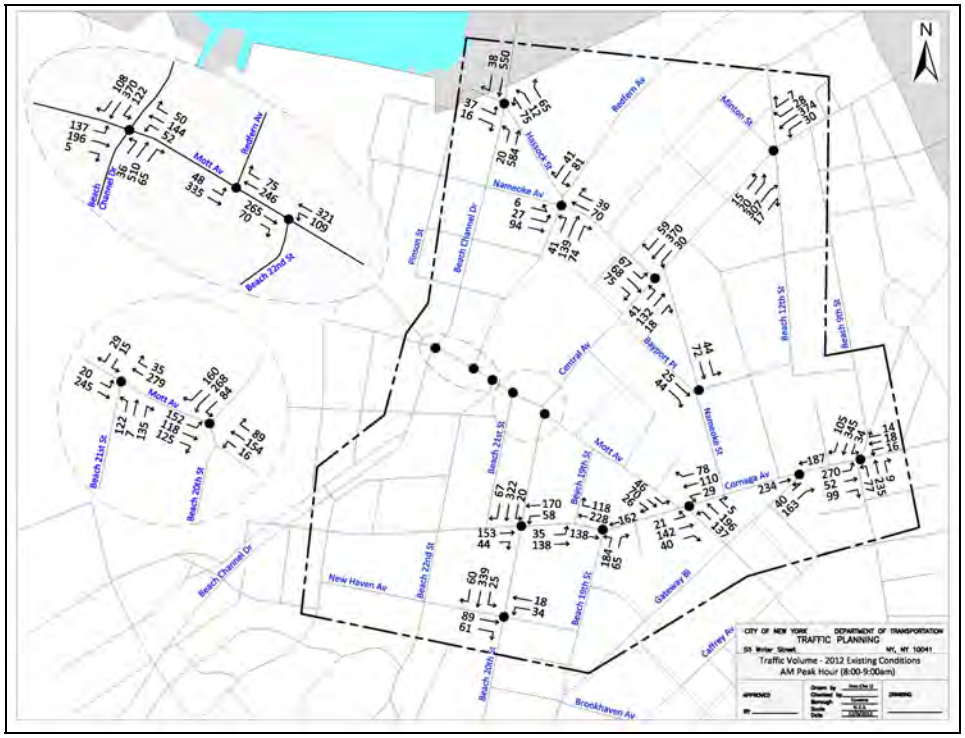


Figure 4-7: PM Peak Hour Volumes

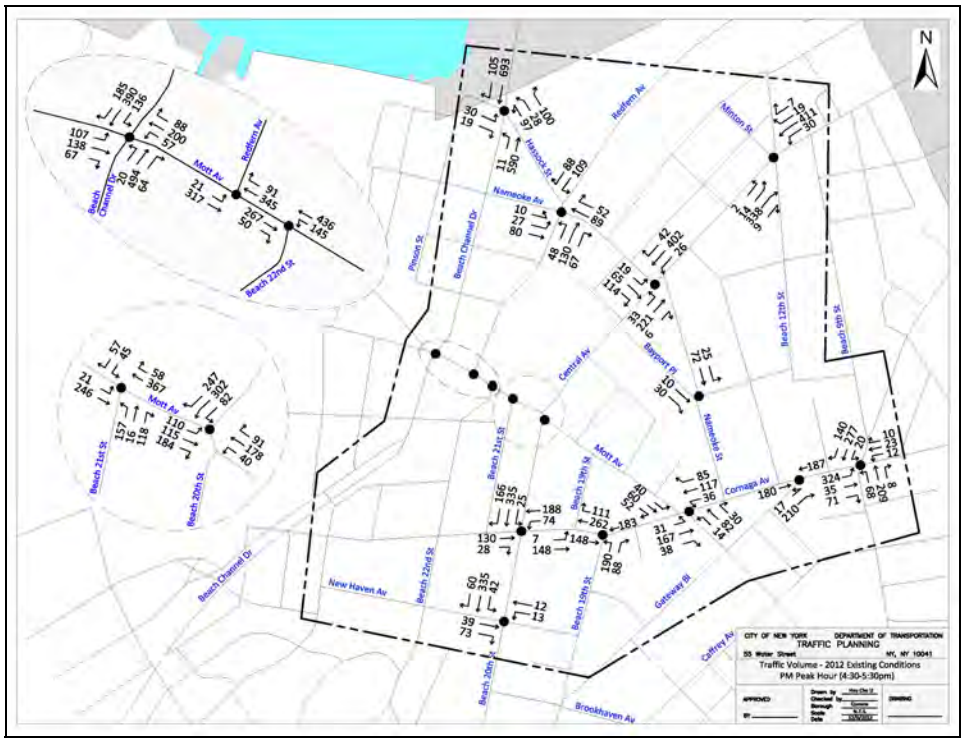
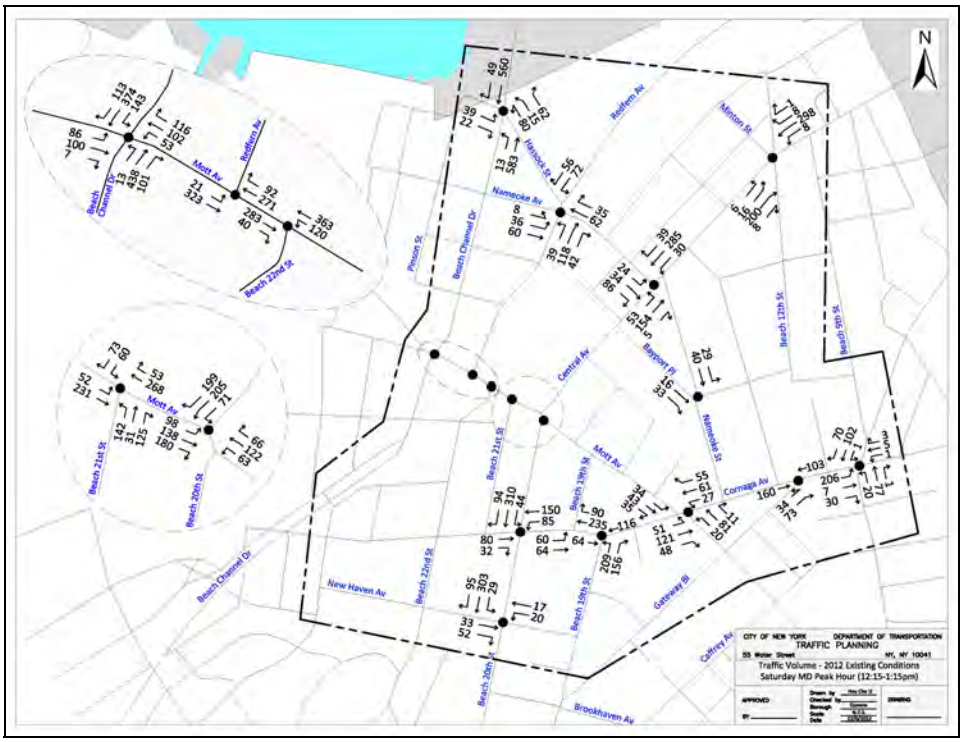


Figure 4-8: Saturday Midday Peak Hour Volumes



4.5 Street Capacity and Level of Service

The capacity of a roadway is the maximum rate of flow which can pass through a section of roadway under prevailing traffic, roadway and signalization conditions. Capacity is determined by analyzing the interaction of several factors, including turning movements, signal timing, geometric design of the intersection, pedestrian movements, type of vehicle, illegal and/or double parking, grade, roadway conditions, and weather. The HCS+/2000 Highway Capacity Manual (HCM) methodology was used to determine street capacity within the study area. The methodology requires the use of official signal timings, street geometry, and other relevant information for performing capacity and LOS analyses. Within the study area, ten signalized and four unsignalized intersections were analyzed. Field visits were conducted in order to observe prevailing conditions.

Traffic flow characteristics are measured in terms of volume-to-capacity (v/c) ratios and delays. The quality of flow is expressed in terms of LOS, which is based on an average delay experienced per vehicle. When the v/c ratio exceeds 1.0, a facility or intersection is operating at or over capacity. In this situation, severe traffic congestion occurs with stop-and-start conditions, and extensive vehicle queuing and delays. Volume-to-capacity ratios of less than 0.85 reflect acceptable traffic conditions, with average delays per vehicle of 45 seconds or less. Tables 4-1a and 4-1b show the LOS criteria as specified in the 2000 HCM for unsignalized and signalized locations. The studied intersections were analyzed for roadway capacity, v/c ratios, vehicular delay, and LOS for the weekday AM and PM peak hours, as well as the Saturday Midday peak hour.

Table 4-1a: Unsignalized Intersection Level of Service (LOS) Criteria (TWSC & AWSC)

Level of Service	Average Control Delay (s/veh)
A	0-10
B	>10-15
C	>15-25
D	>25-35
E	> 35-50
F	> 50
Sources: Highway Capacity Manual 2000, Transportation Research Board	
Note: Average Control delay is measured in terms of seconds per vehicle.	

Table 4-1b: Signalized Intersection Level of Service Criteria (LOS)

Level of Service	Control Delay per Vehicle	Description of Traffic Condition
A	≤ 10.0	LOS A describes operations with low control delay, up to 10 sec/veh. This LOS occurs when progression is extremely favorable and most vehicles arrive during the green phase. Many vehicles do not stop at all.
B	> 10 to 20	LOS B describes operations with control delay greater than 10 and up to 20 sec/veh. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of delay.
C	> 20 to 35	LOS C describes operations with control delay greater than 20 and up to 35 sec/veh. These higher delays may result from only fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear in this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.
D	>35 to 55	LOS D describes operations with control delay greater than 35 and up to 55 sec/veh. The influence of congestion becomes more noticeable at this level. Longer delays may result from a combination of unfavorable progression, long cycle lengths, and/or high v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	>55 to 80	LOS E describes operations with control delay greater than 55 and up to 80 sec/veh. These higher delay values generally indicate poor progression, long cycle length, and high v/c ratios. Individual cycle failures are frequent occurrences.
F	> 80	LOS F describes operations with delay in excess of 80 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with over-saturation, that is, when arrival flow rates exceed the capacity of lane groups. It may also occur at high v/c ratios with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.
Sources:	Highway Capacity Manual, Transportation Research Board;	
	National Research Council, Washington D.C., 2000;	
Note:	Control delay is measured in terms of seconds per vehicle (sec/veh).	

4.6 Existing Traffic Conditions

Tables 4-2a and 4-2b show the 2012 Existing Conditions' v/c ratios, delays, and level of service (LOS) for the AM, PM, and Saturday peaks for signalized and unsignalized intersections. The analysis showed that most intersections operate at an acceptable level-of-service (LOS) D or better during all peak periods. However, four intersections (listed below) experienced LOS D, E or F (45 seconds of delay or worse) for some or all lane groups during one or more peak hours. Figures 4-9, 4-10 and 4-11 show the overall intersection LOS and lane groups with LOS D, E and F, thus identifying locations for potential improvements.

- *Beach Channel Drive @ Hassock Street (AM, PM)*
- *Beach Channel Drive @ Mott Avenue (AM, PM, Sat MD)*
- *Mott Avenue @ Cornaga Avenue (AM, PM, Sat MD)*
- *Mott Avenue @ Beach 20th Street/Central Avenue*

Table 4-2a: Traffic Capacity Analysis for Signalized Intersection
2012 Existing Conditions

Intersection	Approach	Movement	AM			PM			Sat MD		
			V/C Ratio	Avg Delay	LOS	V/C Ratio	Avg Delay	LOS	V/C Ratio	Avg Delay	LOS
Beach 20 St @ New Haven Av											
	SB	LTR	0.54	18.7	B	0.55	18.7	B	0.51	18.1	B
	EB	TR	0.36	10.1	B	0.27	8.8	A	0.17	7.9	A
	WB	LT	0.17	8.0	A	0.05	7.0	A	0.08	7.2	A
	Overall			15.4	B		16.0	B		15.6	B
Beach Channel Dr @ Hassock St											
	NB	LT	0.99	54.0	D	0.98	51.2	D	0.99	53.1	D
	SB	TR	0.46	15.2	B	0.59	17.2	B	0.43	14.7	B
	EB	LR	0.17	19.4	B	0.16	19.3	B	0.20	19.9	B
	WB	LTR	0.17	19.0	B	0.28	20.2	C	0.18	19.0	B
	Overall			31.6	C		29.3	C		31.3	C
Beach Channel Dr @ Mott Av											
	NB	L	0.27	25.1	C	0.27	28.9	C	0.15	23.8	C
		TR	1.05	80.7	F	1.05	82.3	F	1.05	82.9	F
	SB	L	0.43	34.2	C	0.49	35.6	D	0.59	38.7	D
		TR	0.65	20.4	C	0.77	24.4	C	0.73	22.6	C
	EB	LTR	1.01	78.4	E	1.02	83.7	F	0.77	39.9	D
	WB	LTR	0.36	21.3	C	0.46	22.9	C	0.43	22.5	C
	Overall			50.5	D		50.4	D		43.6	D
Central Av @ Nameoke Av											
	NB	LT	0.20	8.2	A	0.22	8.2	A	0.19	8.1	A
	SB	TR	0.72	17.2	B	0.68	15.8	B	0.50	11.8	B
	EB	LR	0.52	21.0	C	0.49	20.3	C	0.37	18.0	B
	Overall			16.0	B		14.5	B		11.9	B
Cornaga Av @ Beach 9 St											
	NB	LTR	0.93	47.1	D	0.75	27.4	C	0.29	14.3	B
	SB	LTR	0.94	42.6	D	0.87	32.6	C	0.32	14.4	B
	EB	LTR	0.88	33.0	C	0.96	45.7	D	0.53	15.5	B
	WB	LTR	0.11	9.9	A	0.09	9.7	A	0.03	9.3	A
	Overall			39.2	D		35.4	D		14.7	B
Cornaga Av @ Beach 19 ST											
	NB	LR	0.46	14.6	B	0.52	15.6	B	0.64	18.3	B
	EB	T	0.29	12.3	B	0.25	11.8	B	0.12	10.6	B
	WB	T	0.24	11.6	B	0.24	11.6	B	0.20	11.2	B
	Overall			13.1	B		13.5	B		15.6	B
Cornaga Av @ Beach 20th St											
	SB	LTR	0.57	19.9	B	0.80	27.3	C	0.65	21.6	C
	EB	TR	0.33	9.6	A	0.25	8.8	A	0.17	8.1	A
	WB	LT	0.36	10.0	B	0.43	10.8	B	0.35	9.8	A
	Overall			14.7	B		19.3	B		16.2	B
Mott Av @ Beach 20 St/Central											
	SB	LT	0.74	35.2	D	0.74	58.2	E	0.49	28.3	C
	EB	DefL	0.50	13.9	B						
		LTR				0.60	12.9	B	0.50	10.8	B
		TR	0.46	11.2	B						
	WB	LTR	0.30	8.5	A	0.33	8.9	A	0.29	8.5	A
	Overall			19.1	B		26.9	C		15.0	B
Mott Av @ Beach 21st St											
	NB	LTR	0.48	20.8	C	0.50	21.1	C	0.52	21.5	C
	SB	L	0.08	21.8	C	0.23	23.7	C	0.28	24.4	C
		R	0.17	23.1	C	0.29	24.9	C	0.41	27.5	C
	EB	LT	0.40	17.4	B	0.38	17.2	B	0.47	18.6	B
	WB	TR	0.45	18.0	B	0.53	19.0	B	0.41	17.4	B
	Overall			18.9	B		19.6	B		20.1	C
Mott Av & Cornaga Av											
	NB	LT	1.04	83.6	F	0.31	20.2	C	0.31	20.0	C
	SB	LTR	0.71	36.9	D	0.86	51.5	D	0.56	27.8	C
	EB	LTR	0.84	44.5	D	0.89	52.2	D	0.91	55.4	E
	WB	LTR	0.91	54.8	D	0.98	69.6	E	0.54	26.4	C
	Overall			58.6	E		53.0	D		36.5	D

Table 4-2b: Traffic Capacity Analysis for Unsignalized Intersection
2012 Existing Conditions

Intersection	Approach	Movement	AM			PM			Sat MD		
			V/C Ratio	Avg Delay	LOS	V/C Ratio	Avg Delay	LOS	V/C Ratio	Avg Delay	LOS
Cornaga Av @ Gateway Blvd (TWSC)	NB(Minor)	L	0.17	18.6	C	0.05	16.0	C	0.12	15.3	C
		R	0.37	17.1	C	0.58	21.2	C	0.20	13.9	B
		Overall		17.5	C		20.9	C		14.4	B
Hassock St/Nameoke @ Redfern A (AWSC)	NB	LTR	-	12.6	B	-	12.9	B	-	10.1	B
	SB	L	-	9.7	A	-	10.1	B	-	9.0	A
	EB	LT	-	11.0	B	-	10.8	B	-	9.8	A
	WB	TR	-	10.3	B	-	10.3	B	-	8.8	A
		Overall		11.4	B		11.5	B		9.6	A
Nameoke St @ Bayport Pl (TWSC)	SB (Minor)	LT	0.19	11.1	B	0.16	10.5	B	0.13	10.3	B
		Overall		11.1	B		10.5	B		10.3	B
Central Av @ Beach 12-Minton S (n/a)											

Figure 4-9: Intersection and Lane Group Level of Service - AM Peak Hour

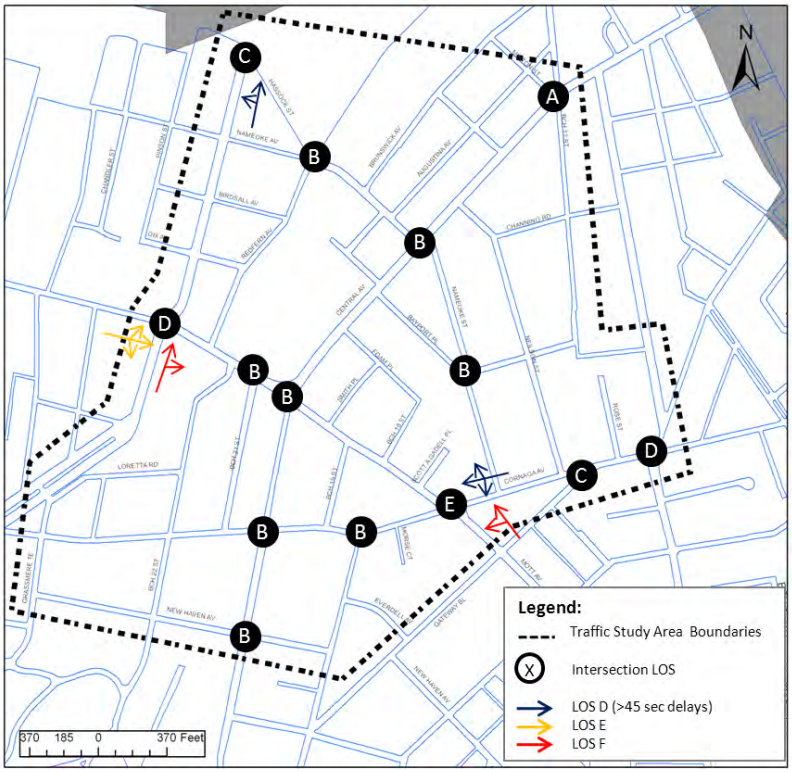


Figure 4-10: Intersection and Lane Group Level of Service - PM Peak Hour

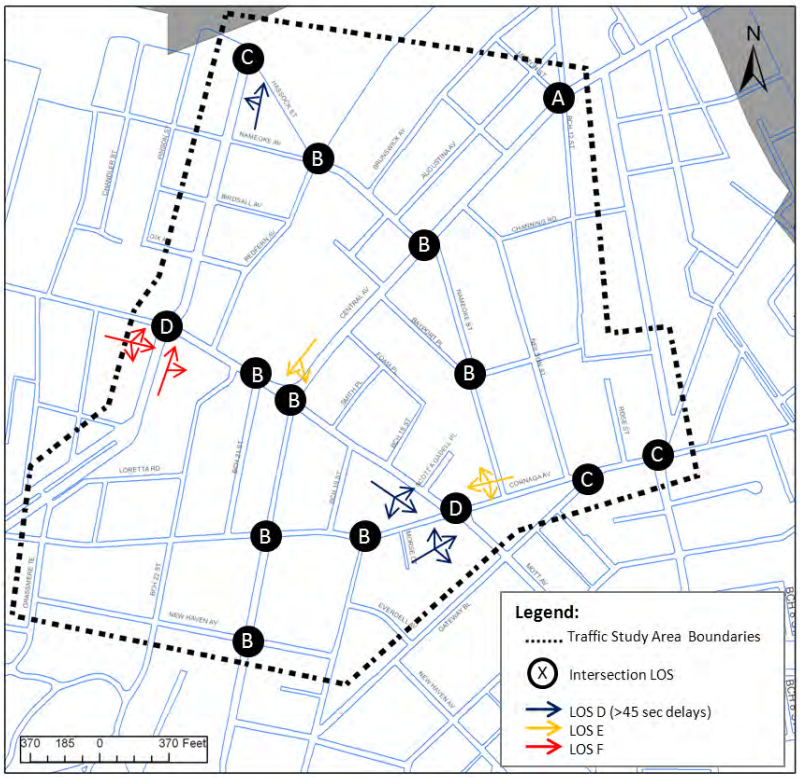
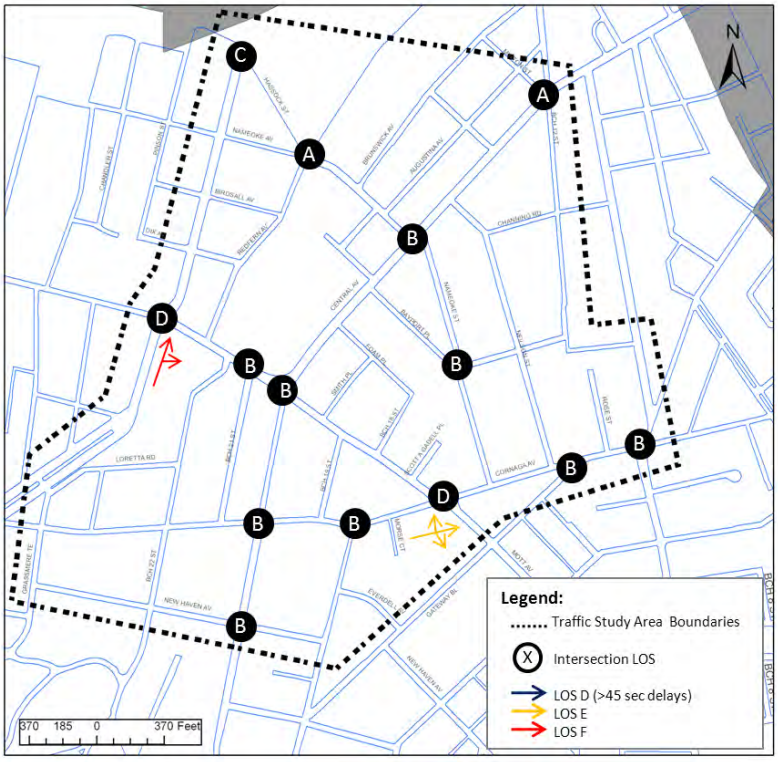


Figure 4-11: Intersection and Lane Groups Level of Service - Sat MD Peak Hour



4.7 Corridor Travel Speeds

To help determine levels of congestion on key corridors in the study area travel time runs were conducted on Mott Avenue, Cornaga Avenue and Central Avenue/Beach 20th Street during the PM peak hour (4:30-5:30PM) using the "floating car" method.

Speed Run Corridor Limits:

- ***Mott Avenue*** *between Beach Channel Drive and Cornaga Avenue*
- ***Cornaga Avenue*** *between Beach Channel Drive and Mott Avenue*
- ***Central Avenue/Beach 20th Street*** *between Nameoke Avenue and New Haven*

Travel speeds along the corridors range from 6 mph to 11 mph. Central Avenue/Beach 20th Street recorded the lowest travel speeds southbound. Table 4-3 summarizes the average travel speeds by direction.

Table 4-3: Corridors Travel Speeds – PM Peak

No	Corridors	Distance(Miles)	Direction	Avg Speed
1	*Mott Avenue between Beach Channel Drive and Cornaga Avenue*	0.35	WB EB	8.8 8.3
2	*Cornaga Avenue between Beach Channel Drive and Mott Avenue*	0.48	WB EB	9.4 6.9
3	*Central Avenue/Beach 20th Street between Nameoke Avenue and New Haven*	0.21 0.46	NB SB	10.5 6.4

4.8 Goods Movement

New York City is heavily dependant on trucks to supply the city with necessary goods and services. Their presence in the traffic network impacts traffic conditions and contributes to congestion, thereby affecting traffic flow. Adequate curb space for loading and unloading is necessary, as there are numerous quality of life issues associated with truck traffic such as noise, air pollution, and safety.

Trucks are generally defined as any vehicle or combination of vehicles designed for transportation of property which has either of the following characteristics: two axles and six tires, or three or more axles. In New York City trucks are confined to designated routes (local and through) except on reaching their origin or destination. They must leave a designated truck route at the nearest intersection that provides the most direct route to their destination.

Truck Routes in the Study Area

The study area is served by one through truck route, Beach Channel Drive/Rockaway Freeway (RFW), which is an east-west corridor; this is shown in Figure 4-12. Trucks accessing the peninsula use Cross Bay Boulevard to Beach Channel Drive at Beach 94th Street, Flatbush Avenue at Beach 169th Street or Sheridan Boulevard and Burnside Avenue in Nassau County.

Figure 4-12: Truck Route Map

Truck Traffic in the Study Area

Truck volume counts were conducted at 14 locations during the various peak hours (8:00-9:00AM and 4:30-5:30PM weekdays, and 12:15-1:15PM Saturday) and the percentage share observed was 4.1%, 1.8% and 1.4%, respectively. This is relatively low compared to other parts of the city. See Table 4-4.

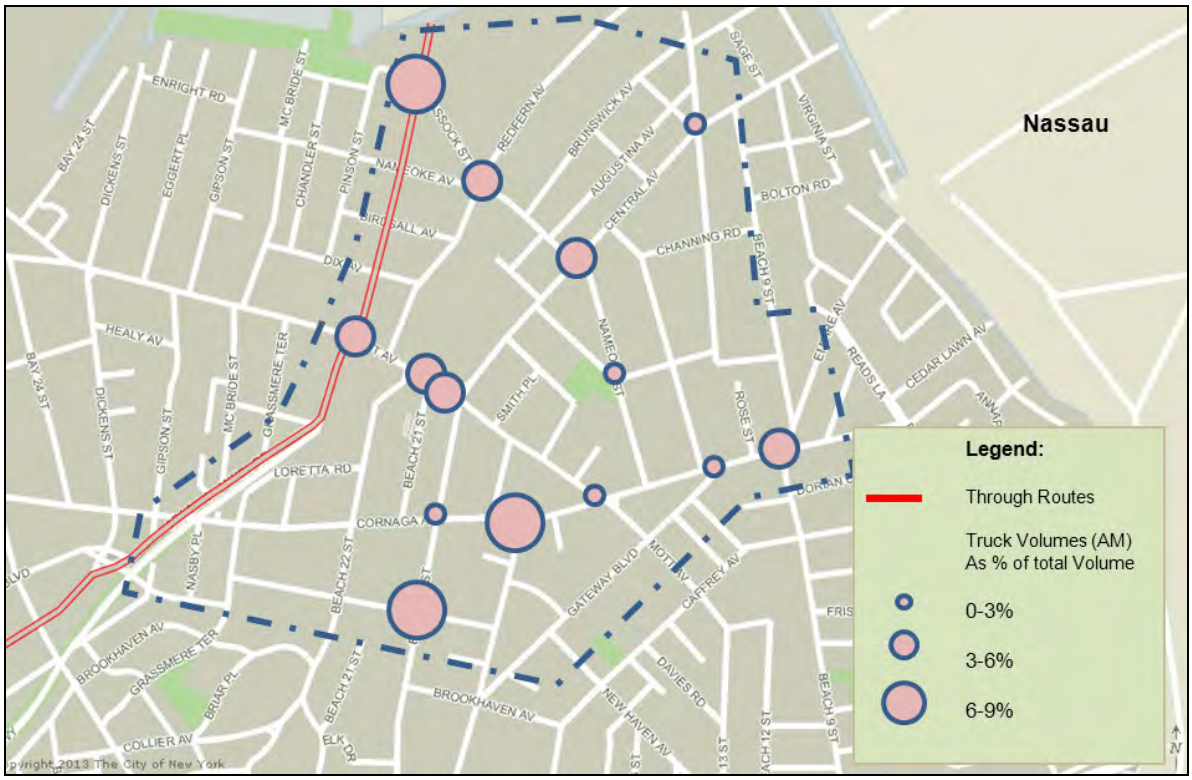
Table 4-4: Truck Volumes by Peak Hour

	AM	PM	Sat MD
Total Vehicles	**11,243**	**12,502**	**10,005**
Trucks	**466**	**228**	**145**
% Trucks	**4.1%**	**1.8%**	**1.4%**

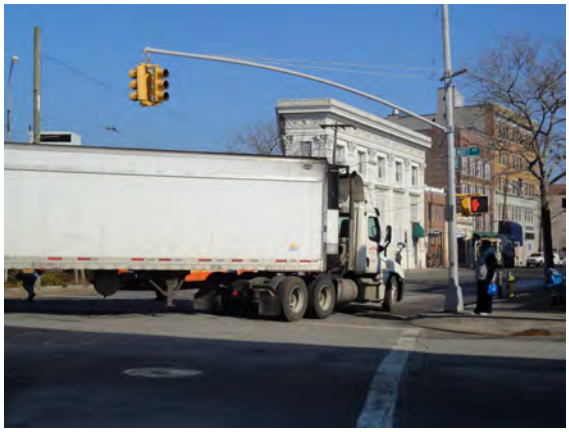
The highest truck volumes were observed during the AM peak hour. Figure 4-13 shows the percentage of trucks in the traffic at the fourteen intersections analyzed. Truck traffic during the PM and Saturday Midday peak hours are less than 4%.

The locations with the highest percentage of trucks during the AM peak are Cornaga Avenue @ Beach 19th Street, Beach Channel Drive @ Hassock Street and New Haven Avenue @ Beach 20th Street.

Figure 4-13: Trucks as Percentage of Total Traffic-AM Peak



The pictures below show some of the truck traffic, truck double parking and loading & unloading truck activities in the study area.



Truck Traffic

Truck double parking

Truck double parking

Truck Traffic

Curb side deliveries

5 Public Transportation

5.1 Introduction

Public transportation plays an important role in satisfying travel demand. The MTA-NYC Transit and Nassau Inter-County Express provide a comprehensive network of bus routes, subways and rail service in the study area. MTA-NYCT operates three bus lines, a subway line and a commuter rail line in the study area. The Nassau Inter-County Express (NICE) service also operates three bus lines with stops in the study area. In addition there are small private vans and buses operating in the area.

There is a MTA-NYC Transit bus terminal at Beach 21st Street between Mott and Cornaga Avenues next to the *Far Rockaway #2 Municipal Parking lot and the* Far Rockaway A Train Terminal. Adjoining the parking lot is a bus layover area and bus stop for passengers transferring to and from the Q22 and N33 buses.

5.2 Bus Service

Three New York City Transit (NYCT) buses (QM17, Q22, Q113) and three Nassau Inter-County Express buses (N31, N32, and N33) provide service to the area. The routes are mainly along Beach 9th , Beach 19th, Beach 20th, and Beach 21st Streets, Beach Channel Drive, Seagirt Boulevard, as well as Mott, Cornaga, and Central Avenues. Figure 5-1 shows the bus routes and stops.

MTA Bus Service:

QM17: The QM17 Express Bus operates between Midtown/Manhattan and Far Rockaway during the AM and PM rush hours weekdays only. In the study area, the route runs along Seagirt Boulevard, Beach 19th, Beach 20th, and Beach 21st Streets. A major load point is Mott Avenue/Beach 21st Street (the beginning/end of the A train, Q113 and Nassau bus lines).

Q22: The Q22 provides daily service from Beach 169th Street in Roxbury to Mott Avenue/Beach 21st Street in Far Rockaway. The route is the same as the QM17 in the study area. There is no overnight service.

Q113: The Q113 provides local and limited stop service between Jamaica Center (Parsons/Archer) and Far Rockaway (Seagirt Boulevard/Beach 20th Street). It operates 24 hours daily. Depending on whether it is local or limited bus it travels along the Nassau Expressway or Rockaway Turnpike to Central Avenue or Beach Channel Drive to Mott Avenue, then to Cornaga Avenue and Beach 9th Street terminating at Seagirt Boulevard/Beach 20th Street.

Nassau Inter-County Express (NICE) Bus Service:

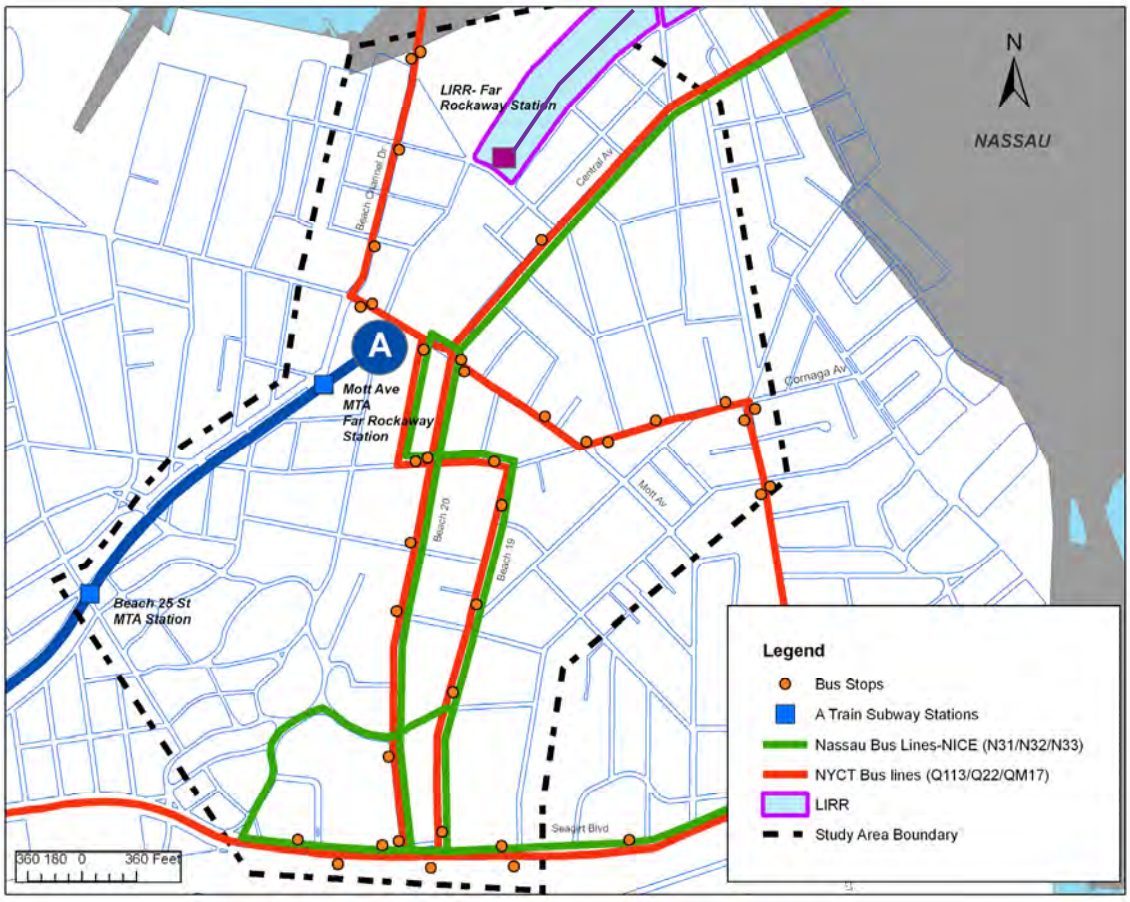
N31/32: The N31 and N32 runs between Hempstead Transit Center (Nassau County) and Beach 20th Street/Seagirt Boulevard (Far Rockaway, Queens). In the study area they run along Central Avenue/Beach 20th Street to Seagirt Boulevard and Beach 19th Street northbound back to Nassau County. There is no overnight service.

N33: The N33 provides service between Long Beach - LIRR station at Center Street/West Park Avenue and Far Rockaway - Mott Avenue/Beach 21st Street.

Other Services:

A private bus company (City Express Corporation) and minivans also operate in the study area providing services to other sections of Queens and Nassau.

Figure 5-1: Public Transit Network



5.3 2011 and 2012 Bus Ridership

Bus ridership includes all passengers who board buses using a valid Metro Card, cash, transfer, SBS ticket or pass. Ridership does not include NYC Transit employees and non-revenue passengers (e.g., children under 44 inches tall traveling with an adult). Average weekday, Saturday and Sunday ridership includes every weekday, Saturday and Sunday in the year, except major holidays.

Average weekend ridership is the two day sum of average Saturday plus average Sunday ridership. Ridership on major holidays (New Year's Day, Presidents' Day, etc.) is included only in the annual total.

In 2011, the NYCT operated 191 local, 4 Select Bus Service (SBS), and 26 limited stop bus routes, while the MTA Bus operated 44 local and 35 limited stop routes (in the five boroughs). In 2012 very minor service changes were made resulting in NYCT operating 190 local, 5 SBS, and 29 limited stop routes, while the MTA Bus had 45 local and 35 limited stop routes.

Table 5-1 shows the annual, weekday and weekend ridership for the buses in the study area for 2011 and 2012 year.

Table 5-1: 2011 & 2012 Bus Ridership

Bus Route	*Rank	Annual Total		Weekday Avg		Weekend Avg	
		2011	2012	2011	2012	2011	2012
QM17	28	102,344	100,801	403	405	-	-
Q22	19	2,310,923	2,263,986	7,350	7,230	8,196	8,320
Q113	10	3,585,396	3,595,325	11,196	11,403	13,698	13,567

**Annual Ridership ranking for 2012 out of 45 MTA buses (Source: MTA).*

**Data for N31/N32/N33 was not available*

Table 5-2 shows the bus frequency (NYCT and NICE) in the study area.

Table 5-2: Average Frequency (in minutes)

Route	Weekday					Saturday					Sunday				
Time	AM	Noon	PM	Eve	Night	AM	Noon	PM	Eve	Night	AM	Noon	PM	Eve	Night
QM17	20	-	25	-	-	-	-	-	-	-	-	-	-	-	-
Q22	9	10	10	20	-	20	10	10	20	-	20	10	10	20	-
Q113	12	20	10	20	60	20	20	20	20	60	20	20	20	20	60
Q113(Limited)	13	20	10	20	-	20	20	20	20	-	-	20	20	-	-
N31/32	18	20	18	30	-	20	20	25	50	-	30	30	30	60	-
N33	30	60	30	30	-	60	30	30	30	-	60	30	30	60	

Notes: Time Periods: AM=7-9, Noon= 11-1, PM= 4-7, Eve= 7-9 and Night= 12 Mid - 4 AM

"-" = no service during time period.

**Headway in minutes. Source: MTA*

5.4 Rail Service

New York City Transit and The Metropolitan Transportation Authority operate one subway line and one commuter rail (LIRR) in the study area. Figure 5-1 shows the rail lines in the study area.

The subway "**A Train**" operates from Inwood/207th Street in Manhattan to both Lefferts Boulevard and Far Rockaway in Queens normally; it also provides service to Rockaway Park during rush hour. In the study area the structure is elevated along Rockaway Freeway with stops at Beach 25th Street and Far Rockaway-Mott Avenue.

After Super Storm Sandy (October 2012) there were no "A" train service between Howard Beach-JFK and the Rockaways; the MTA provided free shuttle bus service between the Howard Beach and Far Rockaway-Mott Avenue stations. Also, a free shuttle train "H" service operated between the Far Rockaway-Mott Avenue and Beach 90th Street. The "A" train was returned to regular service in June 2013.

Commuter Rail: The LIRR is the only commuter rail service in the study area**.** The LIRR Far Rockaway station is located on Nameoke and Redfern Avenues. It facilitates connection to NYC Transit "A" train and the Queens buses Q22/Q113/QM17 as well as Nassau buses N31, N32 and N33.

5.5 2011 and 2012 Subway Ridership

Subway ridership consists of all passengers (other than NYC Transit employees) who enter the subway system, including passengers who transfer from buses. Ridership does not include passengers who exit the subway or passengers who transfer from other subway lines, with the exception of out-of-system transfers.

As shown in Table 5-3, the Far Rockaway-Mott Avenue and Beach 25th Street stations experienced a decrease in ridership between 2011 and 2012 due mainly to service disruptions

caused by Super Storm Sandy. Generally, the Beach 25th Street station handles about 1/3 of the ridership of the Mott Avenue station.

Table 5-3: 2011 & 2012 Study Area Subway Ridership

Station	Train Lines	*Rank		Annual Total		Weekday Average		Weekend Average	
		2011	2012	2011	2012	2011	2012	2011	2012
(1) Far Rockaway @ Mott Ave	A	298	324	1,426,835	1,217,871	4,750	4,068	3,953	3,639
(2)Beach 25 St	A	404	408	501,037	437,602	1,702	1,494	1,235	1,163

**Annual Ridership ranking out of 421 subway stations. Source: MTA*

6 Parking

Parking and curb usage play an important role in the overall transportation system. Inadequate parking could lead to unnecessary circulation as motorists search for parking spaces, or to illegal and double parking, thus reducing roadway capacity.

The parking analysis focused on the major corridors in the CBD during the weekday peak periods (7:00-9:00AM and 4:00-6:00PM) and the weekend peak period (12:00-2:00PM Saturday). The survey documented existing on-street and off-street parking supply and utilization through a combination of field surveys, observation and interviews.

On-street parking is generally permitted on all streets in the study area except where prohibited by parking regulations to facilitate street cleaning or enhance traffic operations. Off-street parking facilities are mainly accessory parking associated with commercial retail and/or offices.

6.1 Off-Street Parking

Off-Street Public Parking

The only public parking facility in the study area is the "*Far Rockaway #2 Municipal Parking Field*". It is located on Beach 21st Street between Mott and Cornaga Avenues (adjacent to the subway station) and has a capacity of 70 spaces. Figure 6-1 shows the location of the parking lot. It operates as follows:

- Open Monday to Saturday from 8:00 AM to 10:00PM Except Sunday
- Unattended metered facility (Pay & Display)
- Accepts quarters, dollar coins, NYC Parking Cards and credit cards
- Rates: 25¢ per 15 minutes, $8 max, 14 hour limit

There are no privately owned parking garages or lots in the study area.

Off-Street Accessory Parking

An inventory of off-street accessory parking (garage/lots) reveals there are 54 facilities with a combined capacity of 1,819 spaces. The majority of which are located east of Central Avenue/Beach 20th Street with some on Beach Channel Drive north of Mott Avenue.

Three garage/lots are accessory to residential, three to government (police, fire, and MTA/LIRR), seventeen to institutional building (churches, schools and hospital centers) and thirty-one to commercial establishments (banks, McDonalds, supermarkets). The largest facility with approximately 400 spaces serves the Far Rockaway Shopping Center on Mott Avenue. Figure 6-1 shows the location of the facilities and Table 6-1 lists their capacities and utilization for the Saturday midday peak period.

The survey revealed that about 19 of the 54 accessory facilities were about 50% or more utilized, with just one operating at capacity. Overall utilization was 30% on average during the Saturday midday peak. Thus, generally, parking supply in the area is adequate to meet demand.

Figure 6-1: Off-Street Parking Facilitates & Capacity

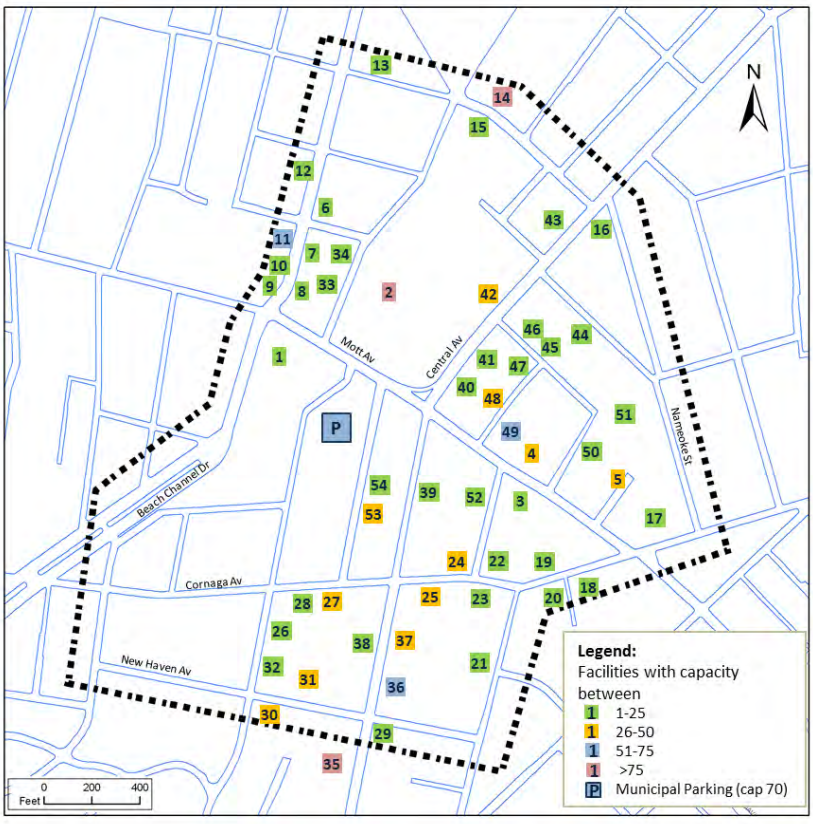


Table 6-1: Off-Street Parking Facilitates Capacity & Utilization

ID	Lot-Garage Name	Location	Capacity	Occupancy	Utilization - Sat MD	Use Type
1	McDonalds	Mott Ave bet. Beach Channel Dr and B 22 St	21	11	52%	C
2	Shopping Center	Mott Ave bet. Redfern Ave & Central Ave	400	65	16%	C
3	Church	Mott Ave bet. Cornaga Ave & B 19 St	18	1	6%	I
4	Church-Temple	Mott Ave bet. B 19 St & B 18 St	40	20	50%	I
5	NYPD Parking	Mott Ave (on Scott A Gadell Pl)	33	23	70%	G
6	BP Gas Pump	Beach Channel Dr bet. Birdsall Ave & Dix Ave	6	3	50%	C
7	Car Wash	Beach Channel Dr bet. Dix & Mott	5	4	80%	C
8	KFC	Beach Channel Dr bet. Dix & Mott Ave	13	3	23%	C
9	White Castle	Beach Channel Dr bet. Mott Ave & Dix Ave	10	1	10%	C
10	Klean Laundry	Beach Channel Dr bet. Mott Ave & Dix Ave	20	9	45%	C
11	Rockaway Mental Health Svc	Beach Channel Dr bet. Mott Ave & Dix Ave	52	0	0%	C
12	Church -Rehdboth	Beach Channel Dr bet. Birdsall Ave & Dix Ave	13	2	15%	I
13	Church/Const. truck	Nameoke St bet. Beach Channel Dr & Dist Bndy	20	5	25%	I/C
14	MTA/ LIRR Parking	Nameoke Ave bet. Redfern & Brunswick Aves	90	3	3%	G
15	NY Wholesale Co.	2047 Nameoke St	8	0	0%	C
16	Deli-Grocery Store	Nameoke St bet. Central Ave & Bayport Pl	18	11	61%	C
17	Apartment Building	Cornaga Ave bet. Nameoke St & Mott Ave	17	13	76%	R
18	CNR Health Care	Cornaga Ave bet. Mott Ave & Morse CT	16	0	0%	I
19	Church	Cornaga Ave bet. Morse CT & B19 St	16	11	69%	I
20	Animal Hospital	Cornaga Ave bet. Morse CT & B19 St	10	10	100%	I
21	Parking Lot	B 19 St bet. Cornaga & New Haven Aves	24	2	8%	C
22	Kosher Pizza World	Cornaga Ave bet. B 19 St & B19 St	25	20	80%	C
23	Sweet Angel-Lot	Cornaga Ave bet. B 19 St & B19 St	7	4	57%	C
24	Kosher Food/Sea and Laundry world	Cornaga Ave bet. B 19 St & B20 St	35	8	23%	C
25	Nova Medical	Cornaga Ave bet. B 19 St & B 20 St	28	0	0%	I
26	Private NYCT Lot	B 22 St bet. New Haven Ave & Cornaga Ave	24	9	38%	G
27	Private Lot	Cornaga Ave bet. B 21 St & B22 St	30	25	83%	C
28	Private Lot	Cornaga Ave bet. B 21 St & B22 St	15	13	87%	C

ID	Lot-Garage Name	Location	Capacity	Occupancy	Utilization Sat MD	Use Type
29	Dry Cleaner	New Haven Ave bet. B 19 St & B 20 St	13	3	23%	C
30	Apartment Building	New Haven Ave bet. B 20 St & B 22 St	28	14	50%	R
31	Key Food Supermarket	New Haven Ave bet. B 20 St & B 22 St	42	30	71%	C
32	Office Building	New Haven Ave bet. B 20 St & B 22 St	17	5	29%	C
33	Cash Checking	Redfern Ave bet. Mott Ave & Dix Ave	16	5	31%	C
34	Apartment Building	Redfern Ave bet. Mott Ave & Dix Ave	18	4	22%	R
35	St John's Hospital Parking	Beach 20 St bet. New Haven Ave & Brookhaven Ave	210	48	23%	I
36	St Mary's Star of the Sea-Church/School	Beach 20 St bet. Cornaga & New Haven Ave	62	32	52%	I
37	Church	Beach 20 St bet. Cornaga & New Haven Ave	36	7	19%	I
38	Metro building supply	Beach 20 St bet. New Haven & Cornaga Ave	13	6	46%	C
39	Church	Beach 20 St bet. Cornaga Ave & Mott Ave	10	4	40%	I
40	Queens Library	Central Ave bet. Mott Ave & Foam Pl	7	3	43%	I
41	Office Building/Fire Dept.	Central Ave bet. Mott Ave & Foam Pl	17	13	76%	C
42	Private Office building Parking	Central Ave bet. Foam Pl & Bayport Pl	37	0	0%	C
43	Community Church	Central Ave bet. Bayport Pl & Nameoke St	16	6	38%	I
44	Church	Bayport Pl bet. Central Ave & Nameoke St	7	1	14%	I
45	Private- Industrial	Foam Pl bet. Central Ave & B 18 St	16	7	44%	C
46	Jewish Community Council	Foam Pl bet. Central Ave & B 18 St	6	0	0%	I
47	Shopping store	Foam Pl bet. Central Ave & Smith Pl	16	0	0%	C
48	Private Parking	Smith Pl bet. Mott & Foam Pl	48	16	33%	C
49	Chase Bank	Smith Pl bet. Mott & Foam Pl	51	33	65%	C
50	US Postal Service	Beach 18 St bet. Mott Ave & Foam Pl	22	6	27%	G
51	IS 53 School	Bayport PL bet. Central Ave & Nameoke St	25	2	8%	I
52	Shopping store	B 19 St bet. Cornaga & Mott Ave	20	9	45%	C
53	Market Parking	B 21 St bet. Mott Ave & Cornaga Ave	40	11	28%	C
54	Parking used by businesses on B 20 St	B 21 St bet. Mott Ave & Cornaga Ave	8	4	50%	C
Public	Far Rockaway 2:Municipal Parking	B 21 St bet. Mott Ave & Cornaga Ave	70	23	33%	G
	TOTAL		**1,885**	**568**	**30%**	-

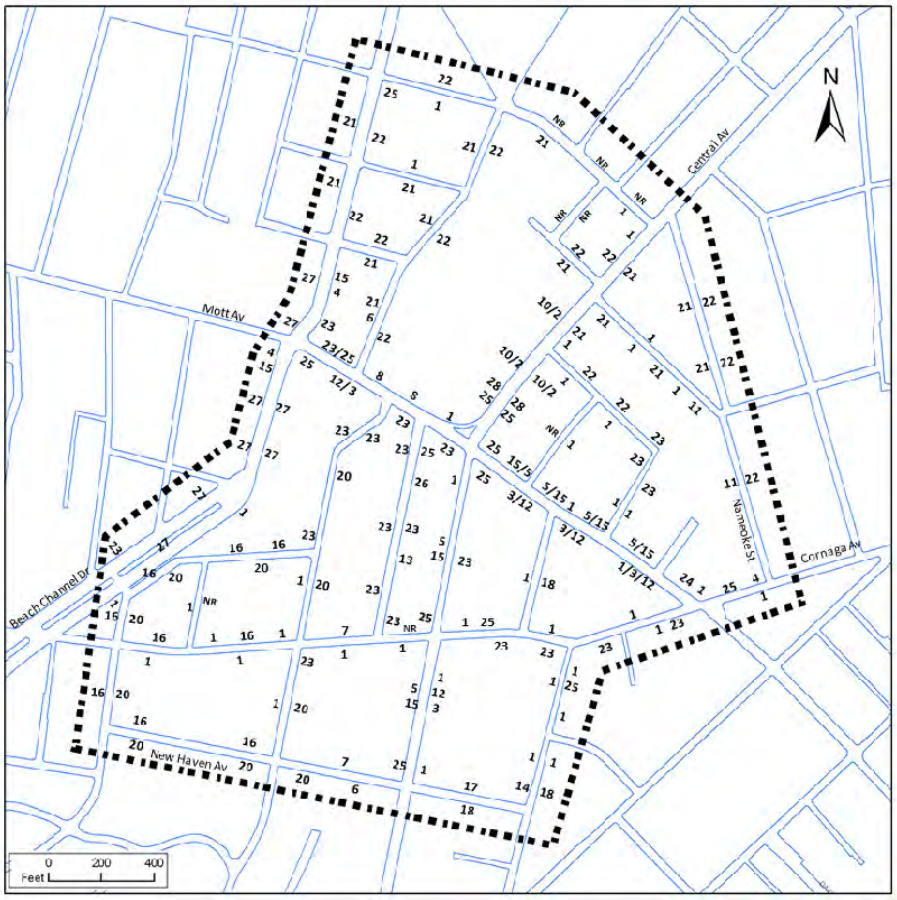
Type of use :

R - Residential , C- Commercial, I - Institutional, G- Governmental, P- Public

6.2 On-Street Parking

The on-street parking survey focused on major corridors where commercial activity is concentrated. The on-street parking spaces and regulations were inventoried. The parking regulations included alternate side parking, metered parking, time restricted parking, and authorized vehicle parking. Figure 6-2 maps the parking regulations codes which are described in Table 6-2.

Figure 6-2: On-Street Parking Regulations



e.g. 1:No Parking Anytime

Table 6-2: On-Street Parking Regulation Codes

LEGEND : On Street Parking Regulation Key

1. No Parking Anytime
2. 2 HR Parking (7:30a-7:00p) Ex Sunday
3. 1 HR Parking (8:00a-7:00p) Ex Sunday
4. 2 HR Parking (8:30a-7:00p) Ex Sunday
5. 1 HR Parking (8:30a-7:00p) Ex Sunday
6. 1 HR Parking (9:00a-7:00p) Ex Sunday
7. No Parking (7:00a-7:00p) Ex Sunday
8. No Parking (7:00a – Midnight)
9. No Parking (7:00a-6:00p) Mon-Fri
10. No Parking (7:00a-7:30a) Ex Sunday
11. No Parking (7:00a-4:00p) School days
12. No Parking (7:30a-8:00a) Ex Sunday
13. No Parking (8:00a-6:00p) Mon-Fri
14. No Parking (8:00a-9:30a) Wednesday
15. No Parking (8:00a-8:30a) Ex Sunday
16. No Parking (8:30a-10:00a) Thursday
17. No parking (8:30a-10:00a)Wednesday
18. No Parking (8:30a-10:00a)Tuesday
19. No Parking (8:30a-10:00a)Mon & Thu
20. No Parking (8:30a-10:00a) Friday
21. No Parking (11:30a-1:00p) Wed
22. No Parking (11:30a-1:00p) Tues
23. No Standing Anytime
24. NS Anytime Except Authorized vehicle
25. No Standing -Bus Stop
26. No Standing (Bus)
27. No Stopping Anytime
28. No Standing (Fire zone)

NR-No Regulation

On Street Utilization/Demand

The parking survey documented capacity, utilization (number of parked vehicles), and parking regulations on each block face along the major corridors by time of day for the AM, PM and Saturday peak hours. There are approximately 981 on-street parking spaces in the study area of which 139 are metered parking. The average parking utilization is 61%, 74% and 75% during the AM, PM and Saturday midday peak hours, respectively (see Table 6-3). Figure 6-3 shows the total capacity and occupancy for each peak hour period.

Even though parking supply generally does not exceed demand in the study area, double and illegal parking was frequently observed in the central core of the CBD/Transit hub. This phenomenon was evident along Mott Avenue, Cornaga Avenue, Beach 21st Street and Central Avenue/Beach 20th Street where private vehicles tend to double park in close proximity to the transit hub for drop off and pick-ups, or a quick stop at one of the stores. Another factor is the absence of loading/unloading zones for deliveries that contribute to congestion. Table 6-3 provides details of where demand exceeds capacity.

Figure 6-3: On-Street Parking Capacity and Occupancy

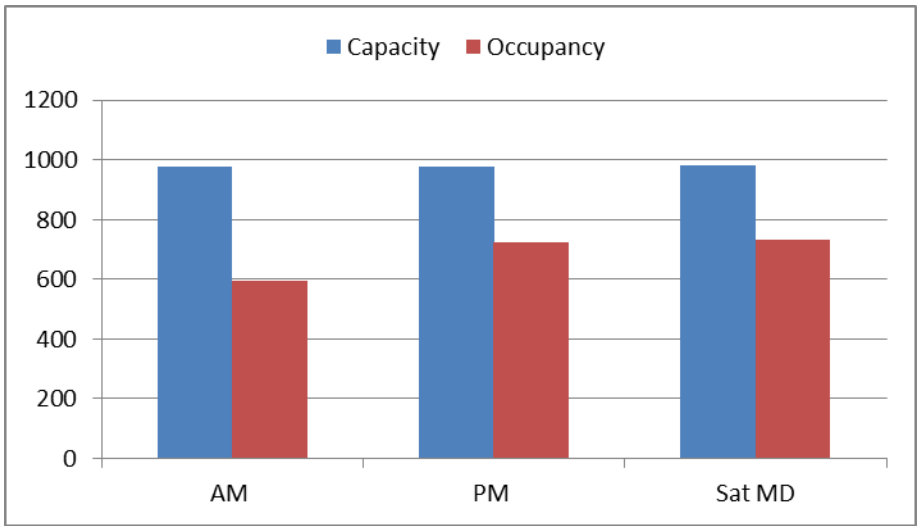


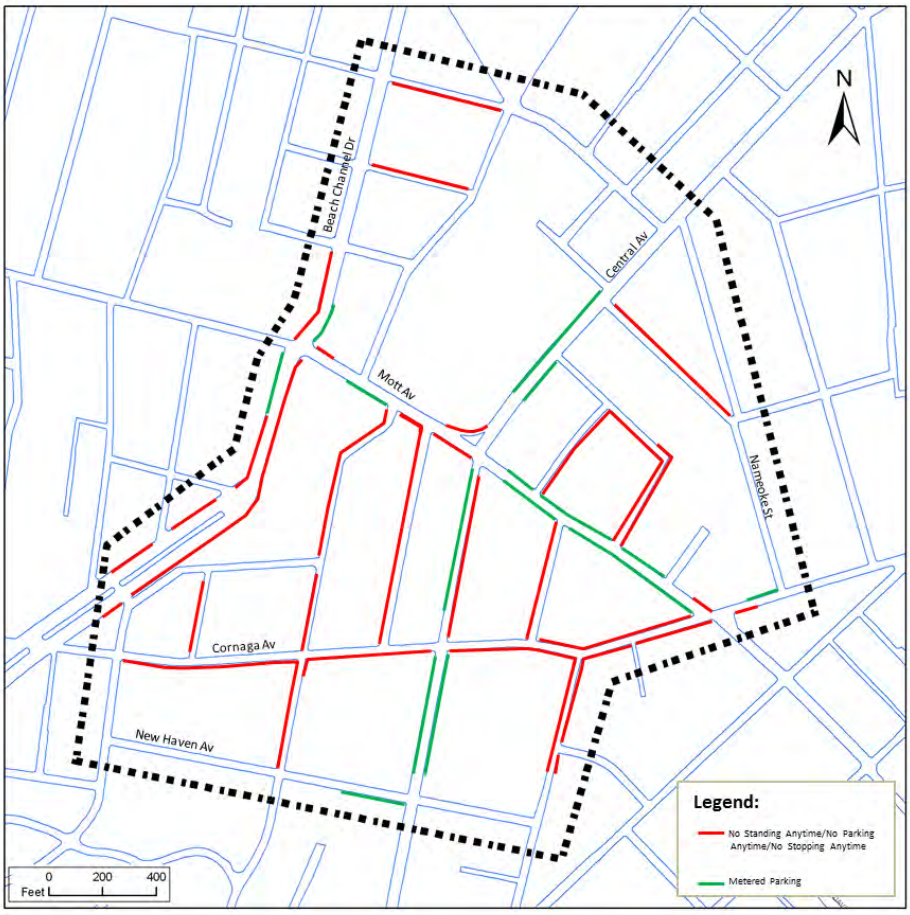
Table 6-3: On-Street Parking Supply & Demand

#	Streets	Total Capacity			Meter Parking	Non Meter Parking	Occupancy			Utilization		
		AM	PM	SAT			AM	PM	SAT	AM	PM	SAT
1	Beach Channel Dr	49	49	49	7	42	15	23	22	31%	47%	45%
2	Mott Ave	95	95	95	62	33	93	100	112	98%	**105%**	**118%**
3	Cornaga Ave	43	43	43	4	39	42	42	48	98%	98%	**112%**
4	Central Ave/Beach 20 St	90	90	90	59	31	31	86	64	34%	96%	71%
5	New Haven Ave	105	105	105	7	98	59	72	87	56%	69%	83%
6	Nameoke Ave	158	158	158	0	158	110	83	87	70%	53%	55%
7	Redfern Ave	81	81	81	0	81	39	44	40	48%	54%	49%
8	Dix Ave	17	17	17	0	17	9	14	15	53%	82%	88%
9	Birdsall Ave	17	17	17	0	17	9	7	8	53%	41%	47%
10	Augustina Ave	21	21	21	0	21	5	9	7	24%	43%	33%
11	Bayport Pl	42	42	42	0	42	24	29	33	57%	69%	79%
12	Foam PL	17	17	17	0	17	16	16	14	94%	94%	82%
13	Smith PL	16	16	16	0	16	15	18	15	94%	**113%**	94%
14	Beach 18 St	21	21	21	0	21	20	16	15	95%	76%	71%
15	Beach 19 St	28	28	28	0	28	30	26	21	**107%**	93%	75%
16	Beach 21 St	11	11	15	0	15	16	26	29	**145%**	**236%**	**193%**
17	Beach 22 St	55	55	55	0	55	6	43	43	11%	78%	78%
18	Grassmere and Loretta	98	98	98	0	98	43	55	60	44%	56%	61%
19	President St	13	13	13	0	13	11	12	11	85%	92%	85%
	TOTAL	**977**	**977**	**981**	**139**	**842**	**593**	**721**	**731**	**61%**	**74%**	**75%**

Utilization in red: Places where double parking and/or illegal parking occurred.

The 139 metered spaces in the study area is concentrated mainly on Central Avenue/Beach 20th Street and Mott Avenue. These spaces have frequent turn over due to the 1 to 2 hour time limit placed on parking and is priced at $.25 cents/per 15 minutes. Figure 6-4 shows no parking and metered parking in the study area.

Figure 6-4: Metered & No Parking Areas



7 Pedestrians and Cyclists

An extensive pedestrian analysis was conducted for this study with two specific objectives in mind. The first is to provide input for a broader urban design initiative that is underway for the Far Rockaway CBD; and secondly, to examine traffic operations involving pedestrian/vehicle conflicts to enhance safety.

7.1 Far Rockaway Urban Design Initiatives

In support of this broader DOT/EDC effort, more pedestrian data was collected and analyzed than would be done for a typical traffic study. To this end pedestrian data was collected to assess pedestrian patterns, flow and circulation particularly around the transit hub, the pedestrian plaza, shopping mall and the municipal parking lot. Pedestrian counts and observations were conducted along Mott Avenue between Beach Channel Drive and Beach 20th St/Central Avenue.

Pedestrian volumes on sidewalks, crosswalks and corners were collected for the AM (7-9) and PM (4-6) peak periods in October 2012 (prior to Hurricane Sandy). As the pedestrian volumes and patterns were altered significantly due to the suspension of the A train service after Hurricane Sandy, the completion of the counts were conducted after the A-train service resumed in June 2013 and travel patterns normalized.

The surveys show that pedestrian movements that appear to be random and chaotic have strong desire lines. The heaviest pedestrian volume was observed during the AM at the subway entrance with the PM volume reflecting reverse commute. This activity was concentrated as there is only one subway entrance which is set back from the south-west corner of Mott Avenue and Beach 22nd Street. The subway station was observed to process approximately 1,770 and 1,465 pedestrians (entering and leaving) during the AM and PM peak hours, respectively. Both the south-east and south-west corners of the subway entrance at Beach 22nd Street recorded the highest number of pedestrian during AM and PM peaks with an average of 790 and 1,200 pedestrians during the two hours.

The south-east corner of Beach 21st Street/Mott Avenue also accommodated high concentrations of pedestrians with approximately 490 and 235 pedestrian during the AM and PM peak hours, respectively. The east curb of the south leg on Beach 21st Street/Mott Avenue is the MTA and NICE bus terminus, as well as the beginning of the Q22 and QM17 bus routes, all contributing to high pedestrian volumes. Figure 7-1 shows basic pedestrian directional flow in and out of the subway station.

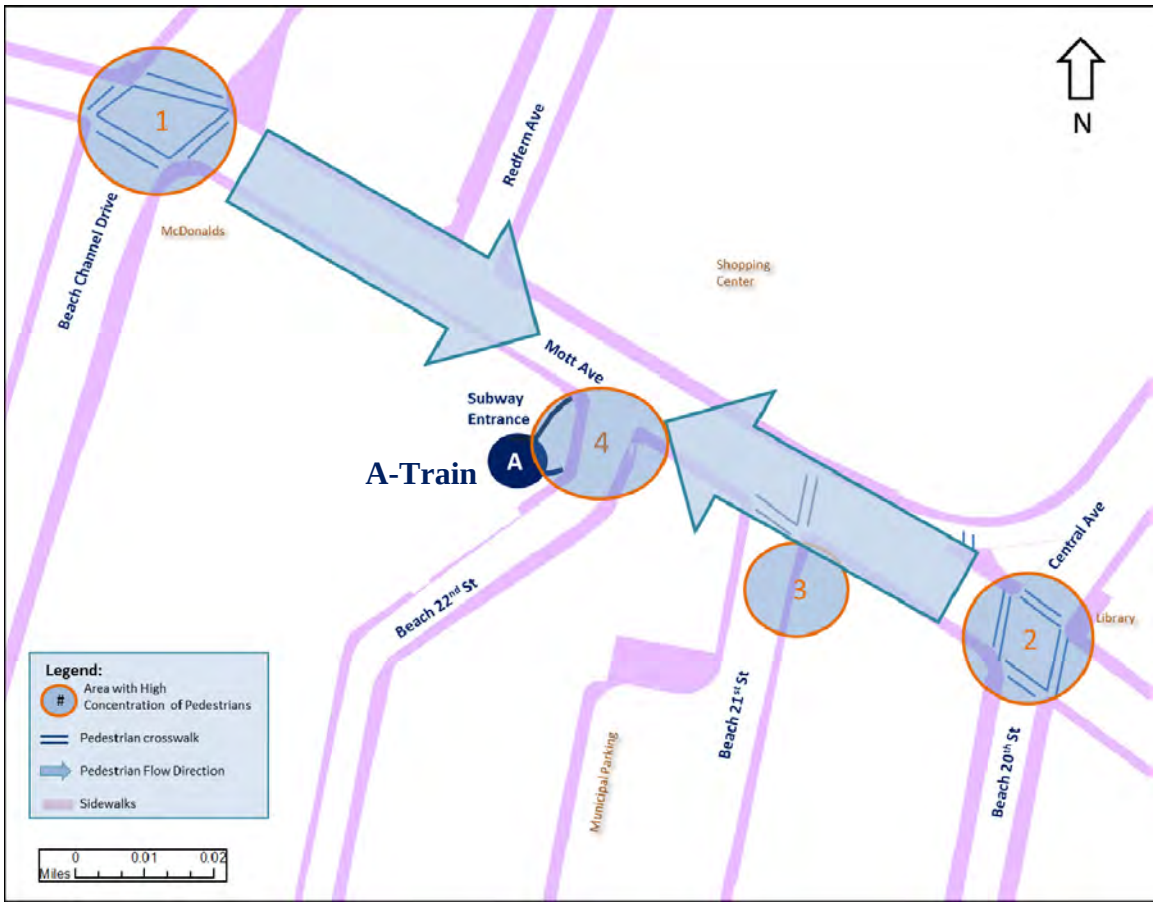
Figure 7-1: Pedestrian Flow from A-Train Station

The main pedestrian origin and destinations are concentrated in four locations:

1. Mott Avenue/Beach Channel Drive intersection - McDonalds and bus stops
2. Mott Avenue/Central Avenue intersection - NYCT and NICE bus stop
3. Beach 21st Street/Mott Avenue intersection (east curb) - NYCT and NICE bus stop

4. Mott Avenue/Beach 22nd Street intersection - the A-train station entrance – with many transfers from buses, minivans, and automobile.

Figure 7-2: Areas of Pedestrian Concentration



Pedestrians from location #1 tend to travel east along Mott Avenue to the subway. Pedestrians from location #2 tend to travel west on Mott Avenue to the subway or other surface transit stops. The same can be said of location #3, and location #4 next to the subway entrance; see Figure 7-2.

As can be expected the pedestrian volumes and density increase as one proceeds on Mott Avenue toward the subway and bus terminus (Beach 22nd St and Beach 21st St). The highest pedestrian volumes were recorded during the PM peak period. However, due to the arrivals of trains and buses, the pedestrian flows tend to occur in surges or platoons resulting in

moments of intense congestions on sidewalks. At times, over five-minute period approximately 450 to 650 pedestrians can be observed during the PM peak; and approximately 250 and 475 pedestrians during the AM peak.

The pedestrian volumes on the south sidewalk of Mott Avenue are generally higher than on the north sidewalk for both peak periods. In the entire pedestrian network the highest pedestrian volumes were observed on the south sidewalk between Central Avenue and Beach 21st Street with approximately 1,700 pedestrian during the PM peak period. Figures 7-3 and 7-4 show the AM and PM peak pedestrian volumes.

Figure 7-3: Pedestrian Volume AM Peak (7-9)

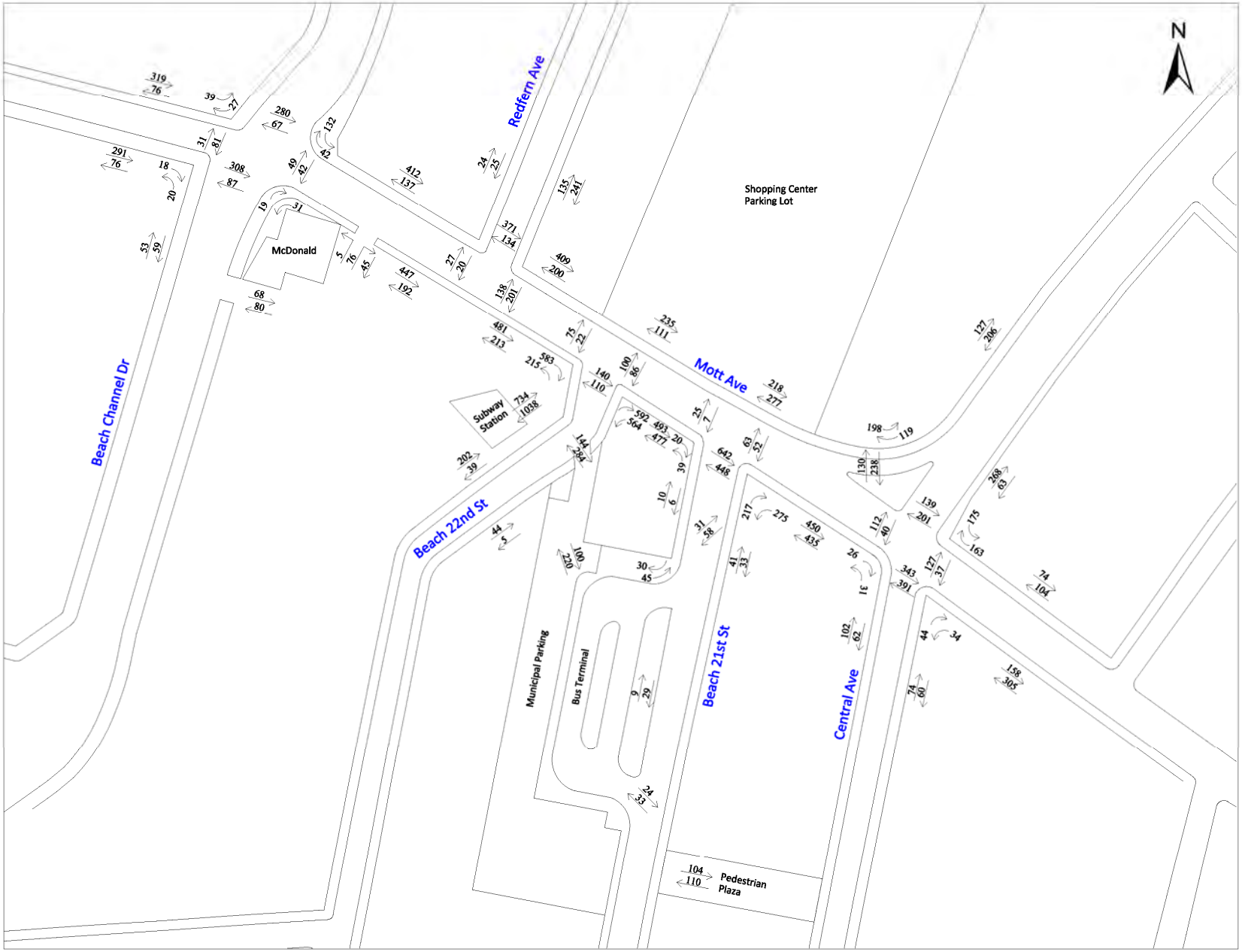
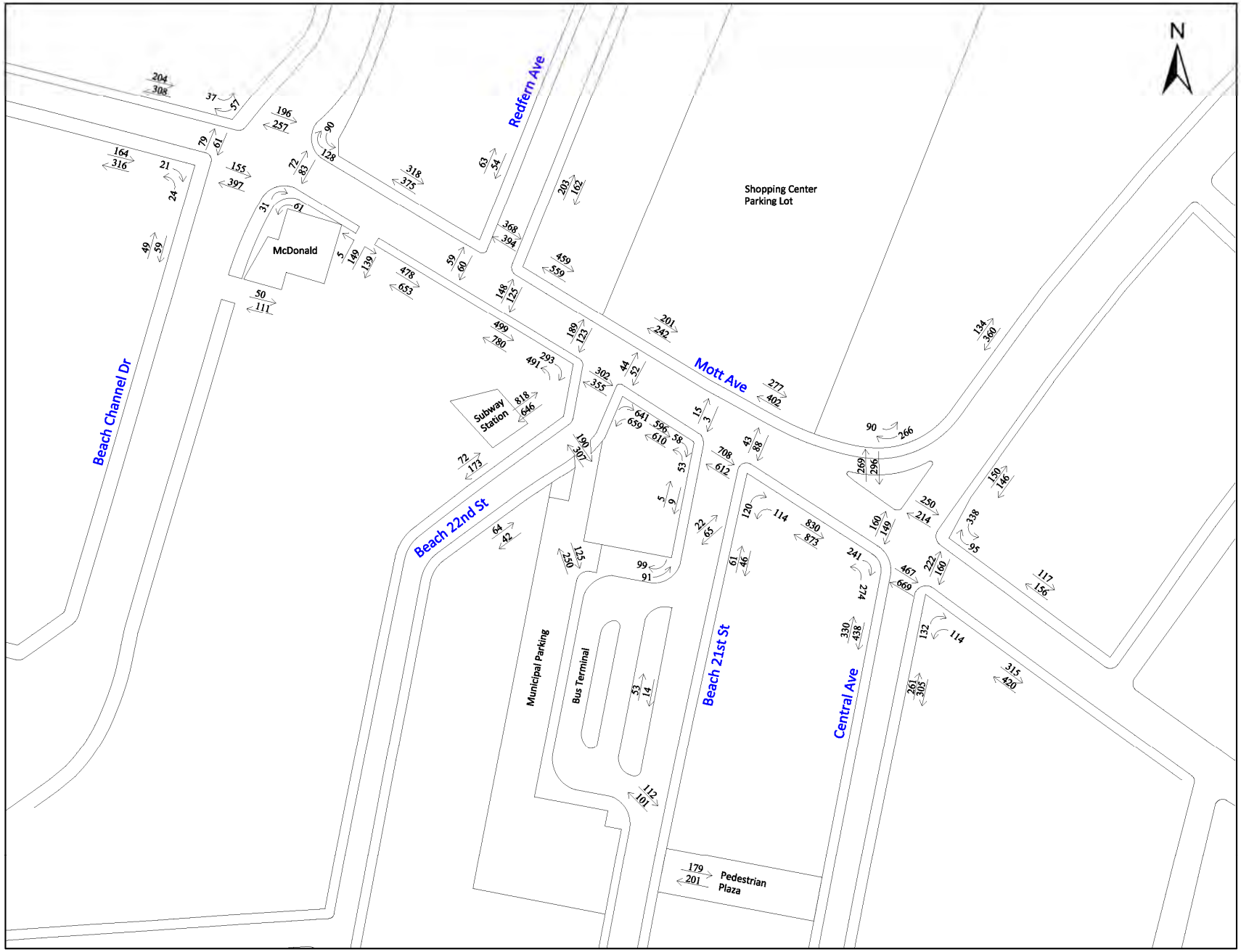


Figure 7-4: Pedestrian Volume PM Peak (4-6)



There is significant jaywalking along Mott Avenue as people tend to travel the most direct route/path to their destination, not necessarily confining their travel to established sidewalks and crosswalks. Figure 7-5 shows the pedestrian flow direction in relation to the subway entrance and bus terminus, and Figure 7-6 shows the pedestrian PM volumes in relation to the transportation services, sidewalk geometry, pedestrian crosswalks and traffic signals along the corridor in conjunction with the jaywalking/desire lines observed in the area.

Figure 7-5: Pedestrian Flows and Transit

Along Mott Avenue between Beach Channel Drive and Beach 20th St/Central Avenue, there are five intersections of which three are signalized with crosswalks. The two unsignalized intersections are Mott Avenue @ Redfern Avenue and Mott Avenue @ Beach 22nd Street; they do not have crosswalks. The pedestrian counts revealed that these two unsignalized locations have as well high pedestrian volumes but with less structured and formal travel paths. Sidewalks in some areas of the corridor are narrow and pedestrian ramps are in need of upgrades.

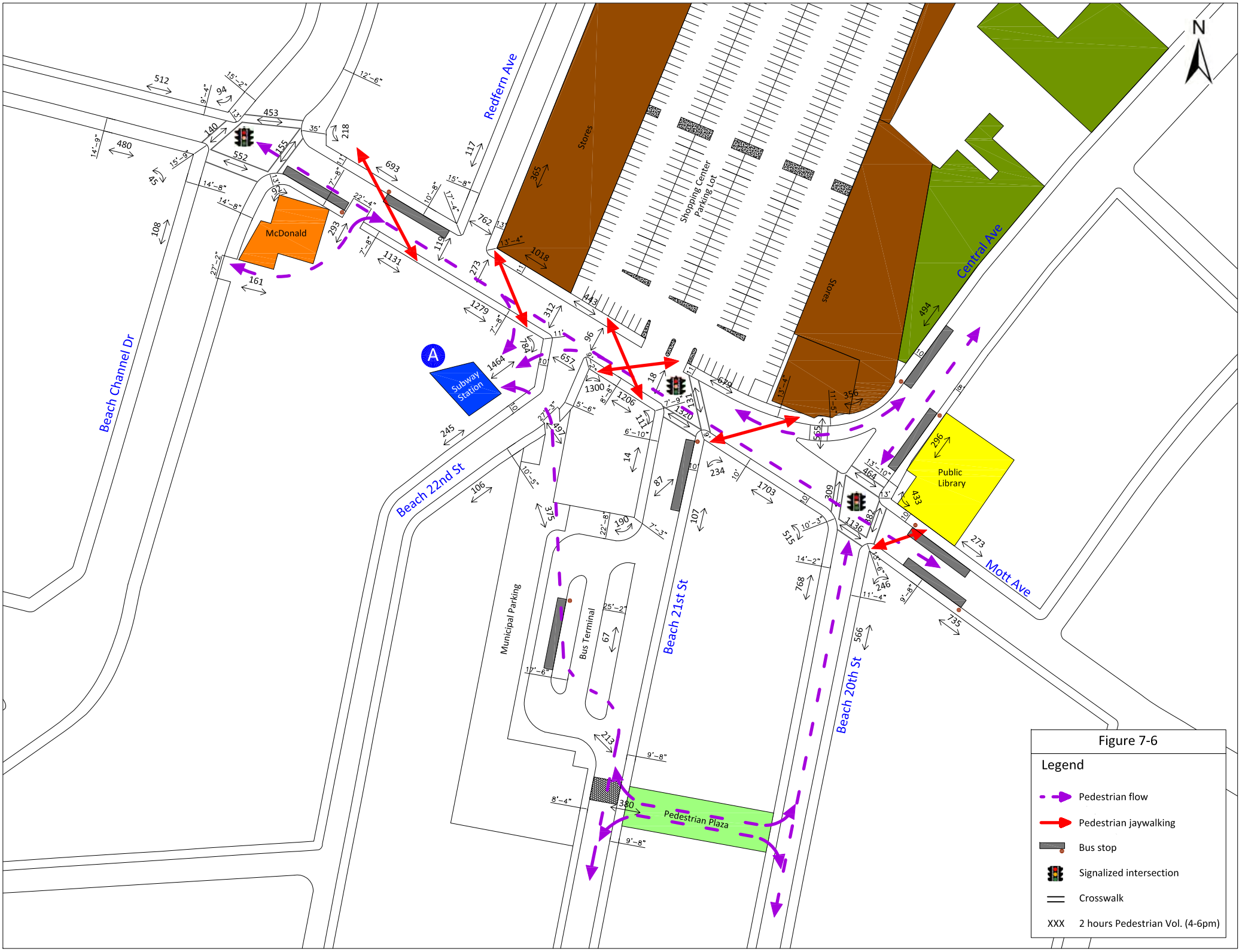

N
Redfern Ave
Central Ave
Beach Channel Dr
Beach 22nd St
Beach 21st St
Beach 20th St
Mott Ave
Stores
Shopping Center Parking Lot
McDonald
Subway Station
A
Public Library
Municipal Parking
Bus Terminal
Pedestrian Plaza
Figure 7-6
Legend
Pedestrian flow
Pedestrian jaywalking
Bus stop
Signalized intersection
Crosswalk
XXX 2 hours Pedestrian Vol. (4-6pm)

Figure 7-7 and 7-8 illustrate the peak period pedestrian volume. As can be seen the south sidewalk on Mott Avenue has the heaviest pedestrian volumes approaching the subway entrance. Figure 7-9 shows the sidewalk widths.

Figure 7-7: Pedestrian Flow Map AM Peak (7-9)

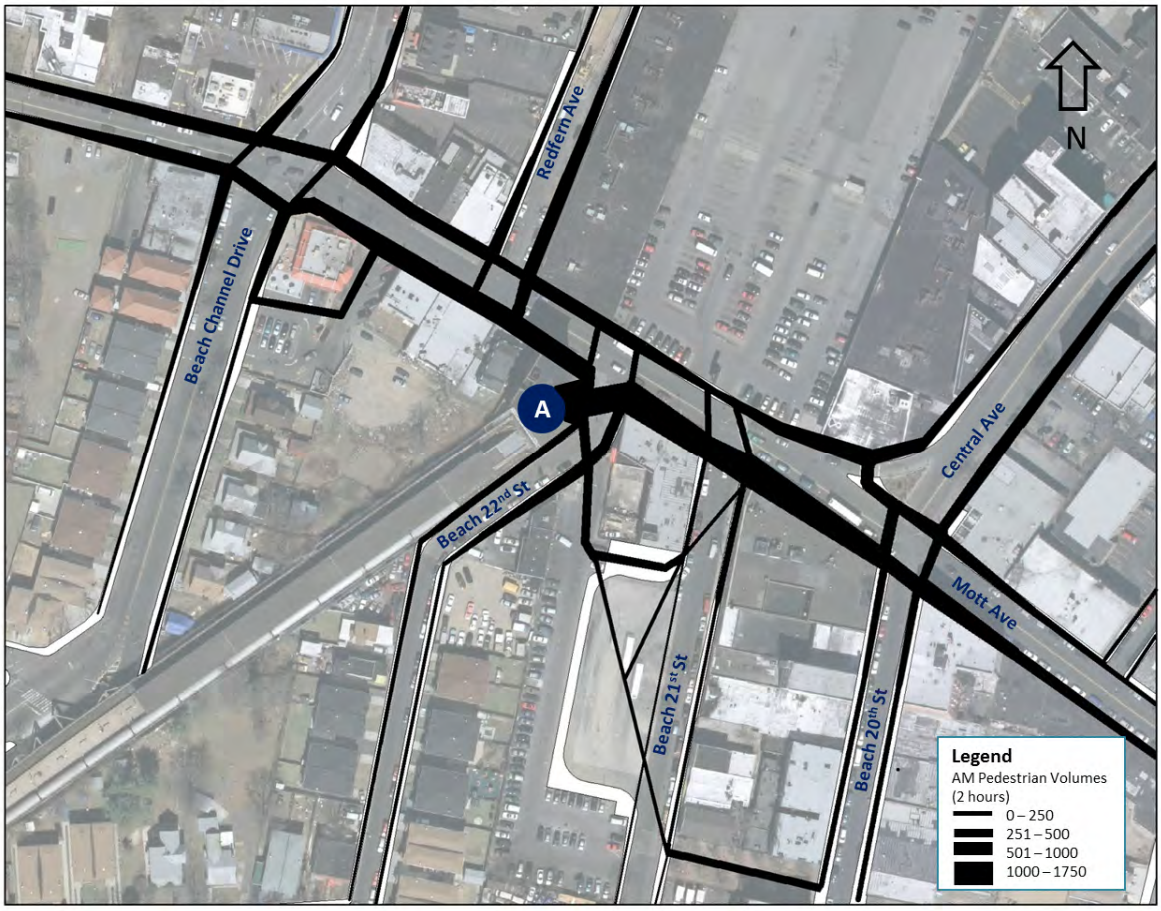


Figure 7-8: Pedestrian Flow Map PM Peak (4-6)

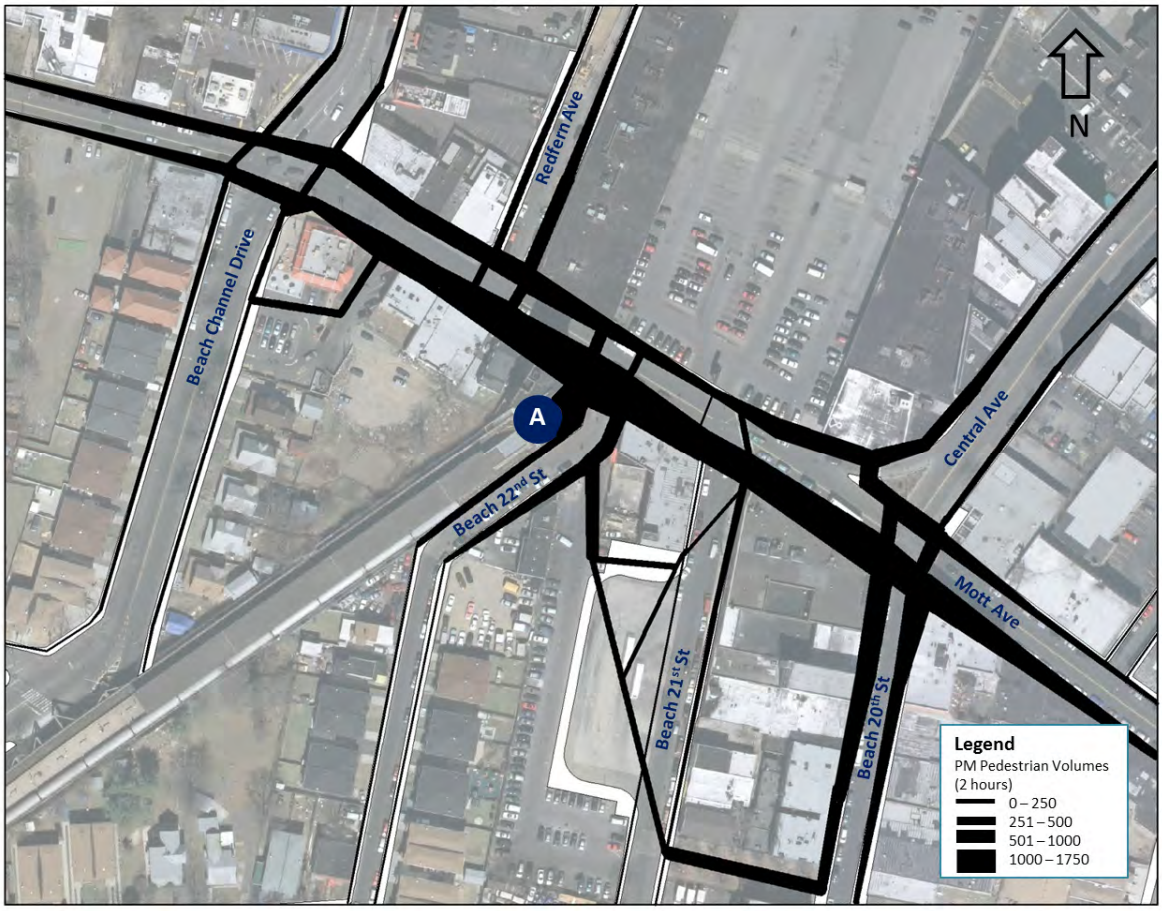


Figure 7-9: Sidewalk Widths

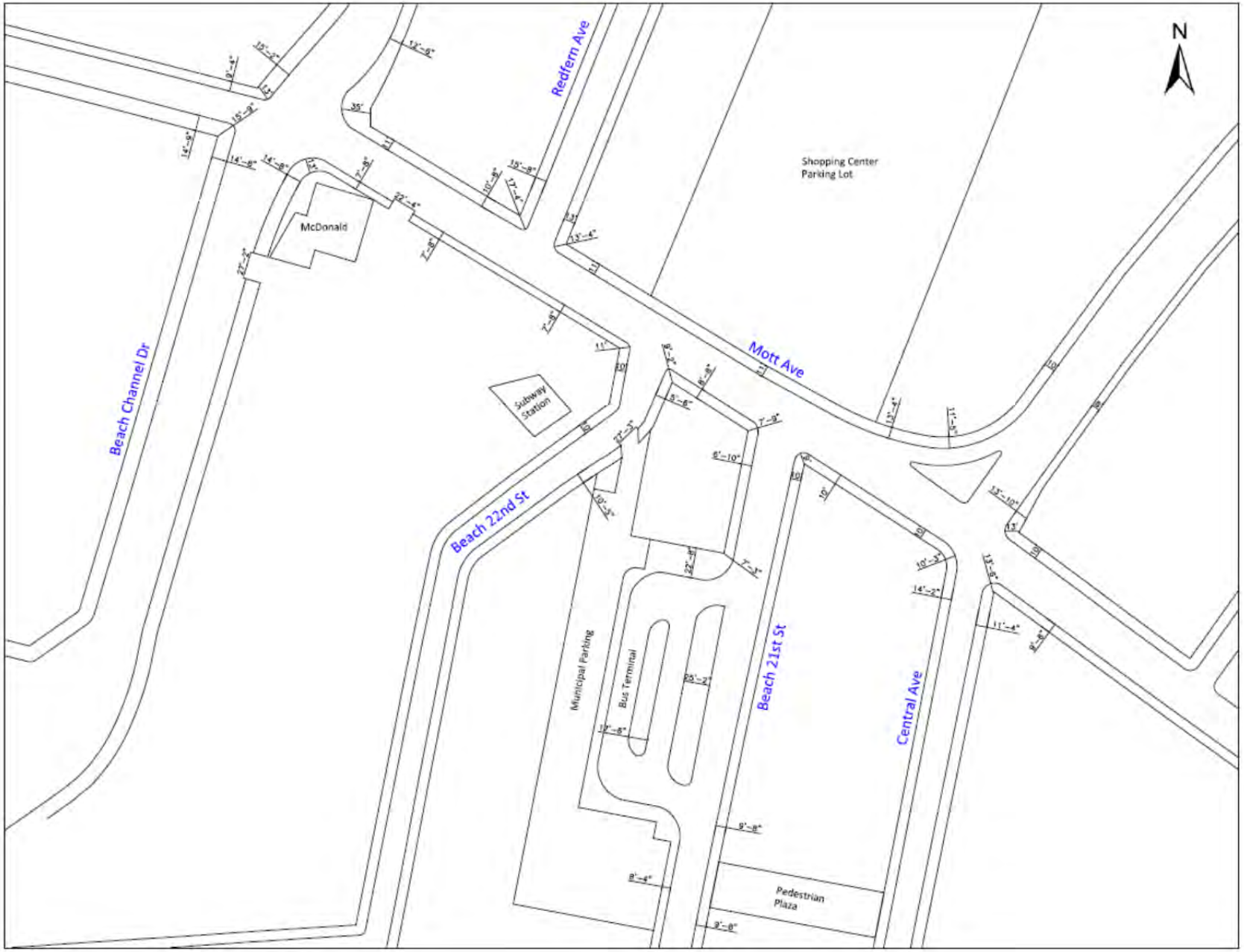
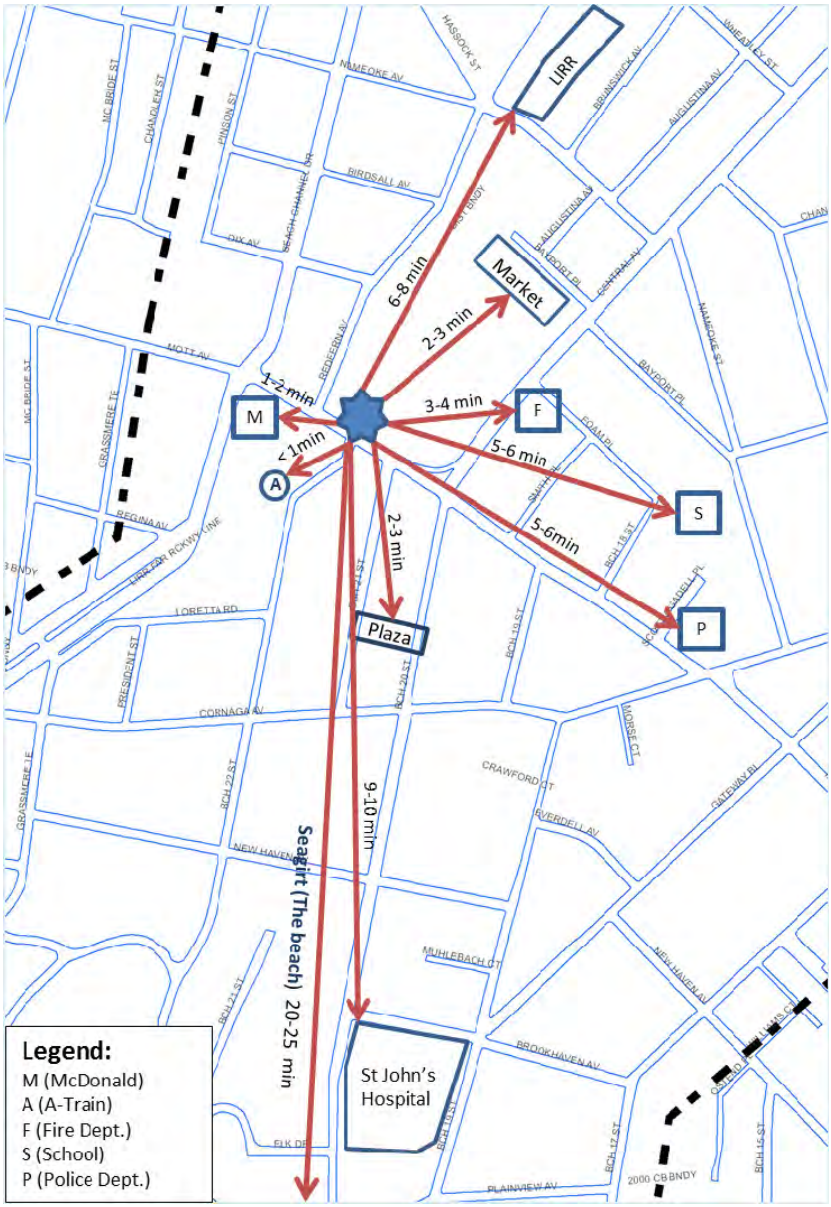


Figure 7-10 shows the walking time between key points in the study area.

Figure 7-10: Walking Time between Key Points



7.2 Existing Conditions Pedestrian Analysis

Consistent with improving access and mobility for all street users, this section examines the existing pedestrian activity and the adequacy of pedestrian facilities to satisfy existing and future demand in the study area.

Land uses such as the St John's Hospital, the shopping center and other commercial activities, mainly along Mott Avenue and Beach 20th Street, generate significant pedestrian traffic. In addition, the intermodal hub, located in the center of the study area, by definition accommodates significant pedestrian flows during the peak hours.

From field observation the roadway segments where significant pedestrian activity was observed are:

- Mott Avenue between Beach Channel Drive and Cornaga Avenue,
- Central Avenue/Beach 20th Street between Cornaga Avenue and Foam Place,
- Beach 22nd Street between Mott Avenue and Cornaga Avenue, and
- Beach 21st Street between Mott and Cornaga Avenues

The pedestrian analysis which focused on the CBD documents pedestrian volumes for crosswalks and corners at key locations. Counts were conducted at 14 intersections along the major corridors in the study area during the AM (8:00-9:00), PM (4:30-5:30) and Saturday MD (12:15-1:15) peak hours, and are listed below:

1. Beach Channel Drive @ Mott Avenue
2. Beach Channel Drive @ Hassock Street
3. Mott Avenue @ Beach 22nd Street/Subway terminal
4. Mott Avenue @ Beach 21st Street
5. Mott Avenue @ Beach 20th Street/Central Avenue
6. Mott Avenue @ Cornaga Avenue
7. Mott Avenue @ Smith Place
8. Cornaga Avenue @ Beach 9th Street/Empire Avenue
9. Cornaga Avenue @ Beach 19th Street

10. Cornaga Avenue @ Beach 20th Street
11. Nameoke Street @ Dinsmore Avenue/Bayport Pl
12. Central Avenue @ Nameoke Avenue
13. Central Avenue @ Beach 12th /Minton Streets
14. Hassock Street @ Nameoke/Redfern Avenue

Figures 7-11, 7-12 and 7-13 show the AM, PM, and Saturday MD peak hour pedestrian crosswalk volumes.

Figure 7-11: Pedestrian Volumes - AM Peak (8:00-9:00)

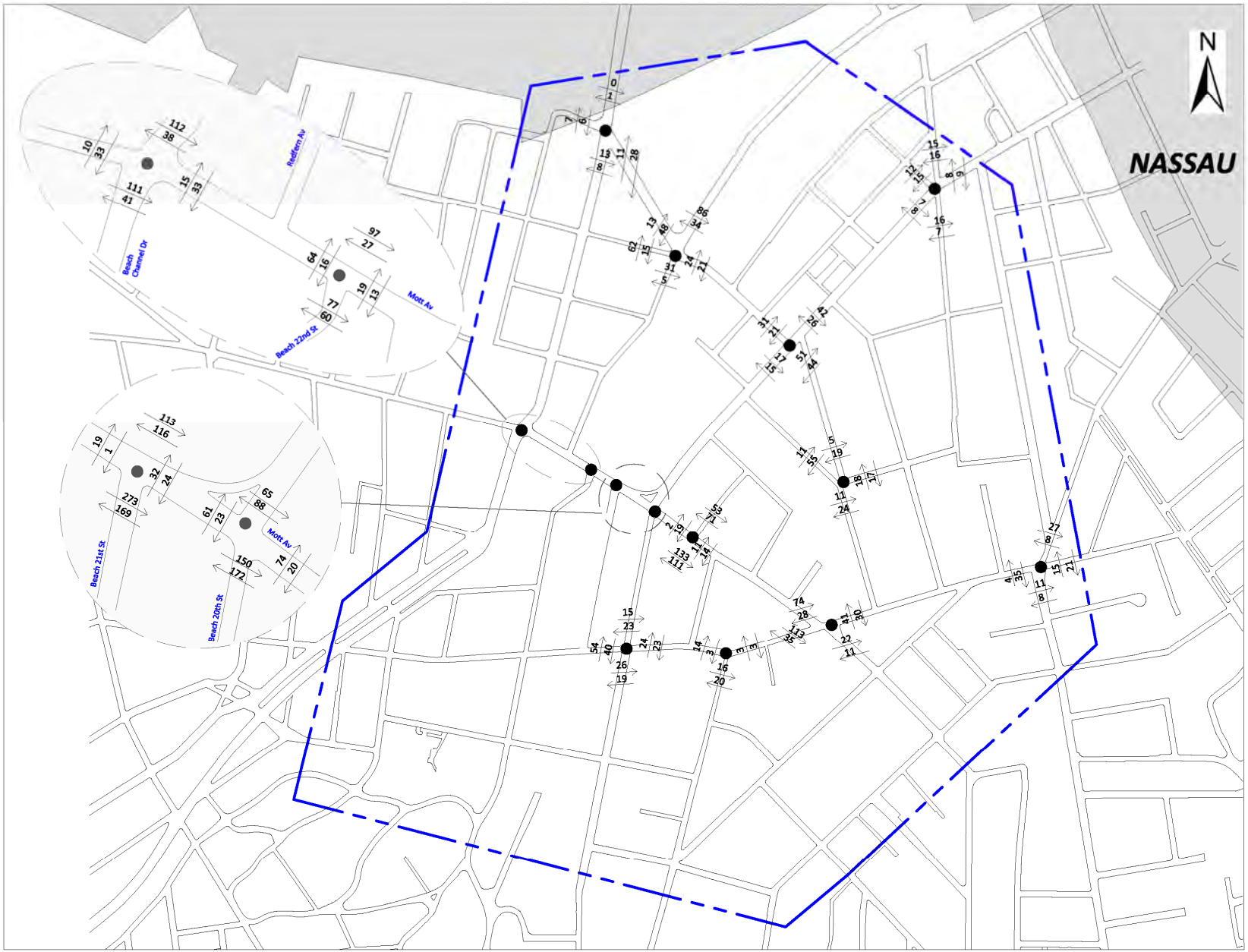


Figure 7-12: Pedestrian Volumes - PM Peak (4:30-5:30)

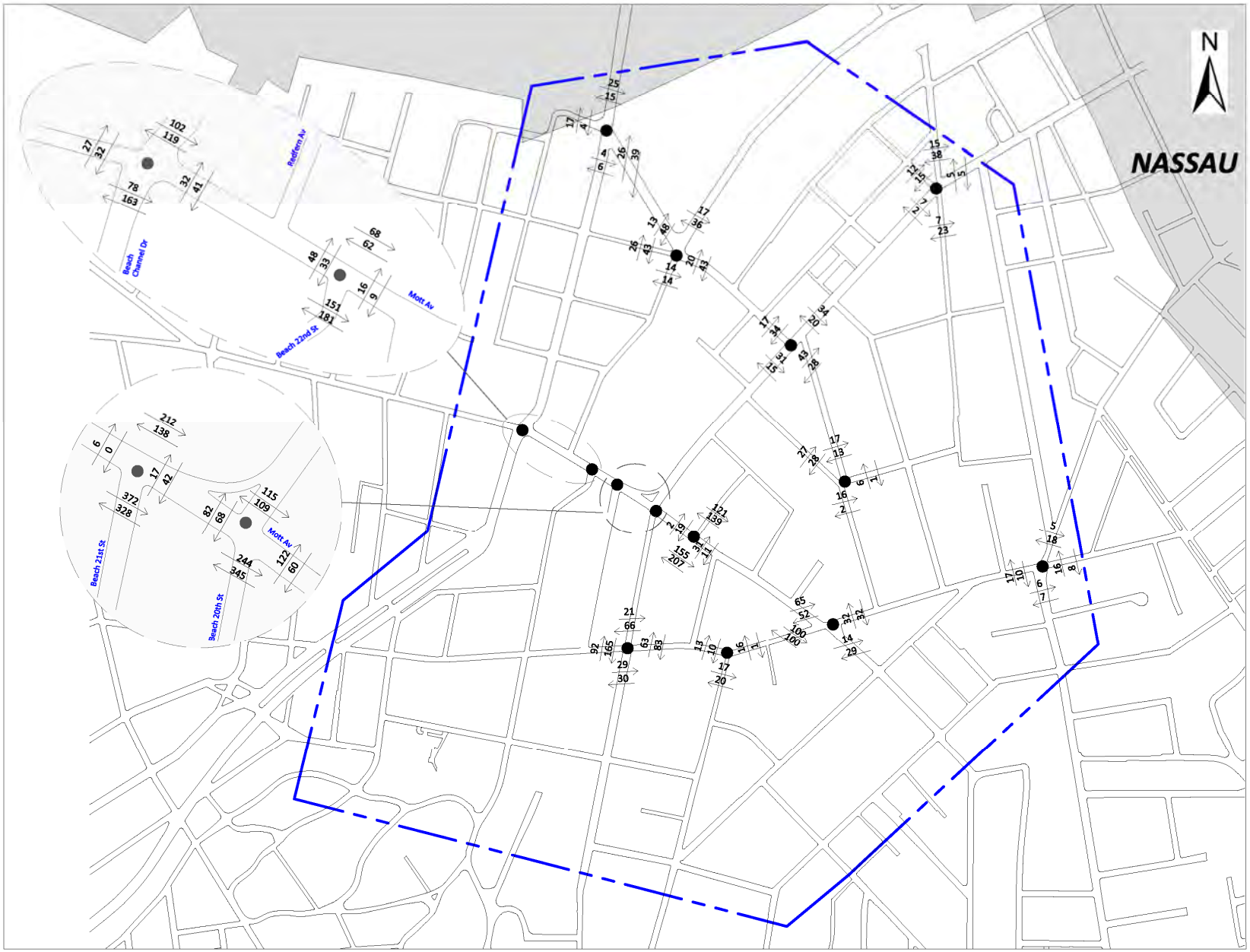
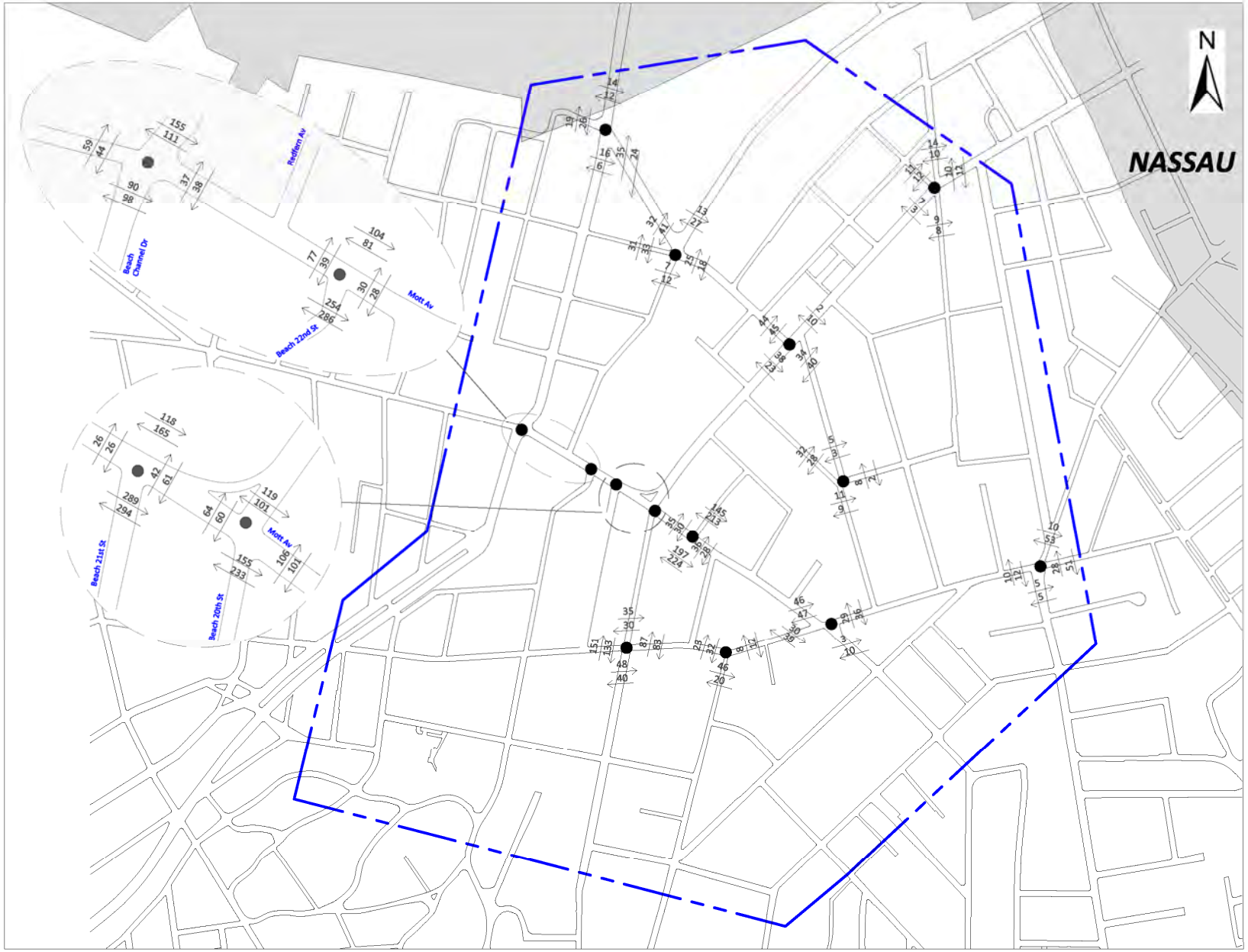


Figure 7-13: Pedestrian Volumes - Saturday MD Peak (12:15-1:15)



Pedestrian Level of Service Analysis and Methodology

The pedestrian level of service (LOS) analysis used the 2000 Highway Capacity Manual methodology. Pedestrian LOS is measured as the pedestrian flow rate per minute per foot of width (p/min/ft). This indicates the quality of pedestrian movement and comfort, and is defined in a density-comfort relationship. Table 7-1 shows the LOS criteria for crosswalks and corners, which are measured in square feet of space per pedestrian.

Table 7-1: Level of Service Definition for Pedestrians

LOS	Descriptions	Space (ft^2/p)	Flow Rate (p/min/ft)	Speed (ft/s)	v/c Ratio
A	Unrestricted	>6	< or = 5	>4.25	< or = 0.21
B	Slightly restricted	40 – 60	5 – 7	4.17 – 4.25	0.21 – 0.31
C	Restricted but fluid	24 – 40	7 – 10	4.00 – 4.17	0.31 – 0.44
D	Restricted; necessary to continuously alter walking stride and direction	15 – 24	10 – 15	3.75 – 4.00	0.44 – 0.65
E	Severely restricted	8 – 15	15 – 23	2.50 – 3.75	0.65 – 1.00
F	Forward progress only by shuffling; no reverse movement possible	< or = 8	variable	< or = 2.50	variable

Source: Highway Capacity Manual, Transportation Research Board, National Research Council, Washington D.C., 2000

Existing Conditions Crosswalk and Corner Analysis

The pedestrian crosswalk analysis shows that all crosswalks operate at acceptable LOS D or better, while the pedestrian corner analysis shows all locations operating at acceptable LOS C or better. Table 7-2 and 7-3 provide a summary of the pedestrian crosswalk and corner analysis for the AM, PM and Saturday MD peak hours.

Table 7-2: Existing Conditions Crosswalk Level of Service

Location	Intersection	Crosswalk	AM		PM		Sat	
			SF/P	**LOS**	**SF/P**	**LOS**	**SF/P**	**LOS**
1	Beach Channel Drive @ Mott Ave	North	98.5	A	76.5	A	64.1	A
		South	126.2	A	69.7	A	89.4	A
		East	315.9	A	242.8	A	230.5	A
		West	296.3	A	162.2	A	113.9	A
2	Beach Channel Drive @ Hassock Street	North	1678.3	A	149.9	A	334.6	A
		South	304.3	A	805.0	A	298.5	A
		East	664.6	A	309.9	A	338.9	A
		West	786.4	A	295.7	A	368.0	A
3	Mott Ave @ Beach 21st Street	North	n/a	n/a	n/a	n/a	n/a	n/a
		South	37.2	C	23.3	D	32.5	C
		East	159.4	A	155.6	A	83.8	A
		West	n/a	n/a	n/a	n/a	n/a	n/a
4	Mott Ave @ Central Ave & Beach 20th Street	North	213.2	A	161.9	A	173.2	A
		South	84.3	A	36.4	C	56.5	B
		East	158.1	A	88.0	A	101.7	A
		West	154.7	A	75.2	A	93.8	A
5	Mott Ave @ Cornaga Ave	North	159.8	A	221.6	A	284.7	A
		South	837.0	A	364.9	A	1680.8	A
		East	n/a	n/a	n/a	n/a	n/a	n/a
		West	79.7	A	83.8	A	233.9	A
6	Cornaga Ave @ Beach 9th Street	North	81.5	A	79.4	A	44.4	B
		South	525.1	A	860.5	A	695.4	A
		East	763.2	A	1172.5	A	259.0	A
		West	457.2	A	435.3	A	382.3	A
7	Cornaga Ave @ Beach 19th Street	North	n/a	n/a	n/a	n/a	n/a	n/a
		South	537.9	A	402.4	A	320.9	A
		East	2067.9	A	740.3	A	676.8	A
		West	1380.0	A	563.9	A	332.5	A
8	Cornaga Ave and Beach 20th Street	North	557.0	A	266.5	A	450.1	A
		South	628.2	A	502.1	A	381.4	A
		East	414.7	A	156.9	A	134.1	A
		West	182.4	A	57.7	B	65	A
9	Central Ave @ Nameoke Ave	North	n/a	n/a	n/a	n/a	n/a	n/a
		South	452.5	A	310.1	A	252.6	A
		East	n/a	n/a	n/a	n/a	n/a	n/a
		West	617.6	A	684.7	A	429.6	A

Red – worst LOS

Table 7-3: Existing Conditions Corner Level of Service

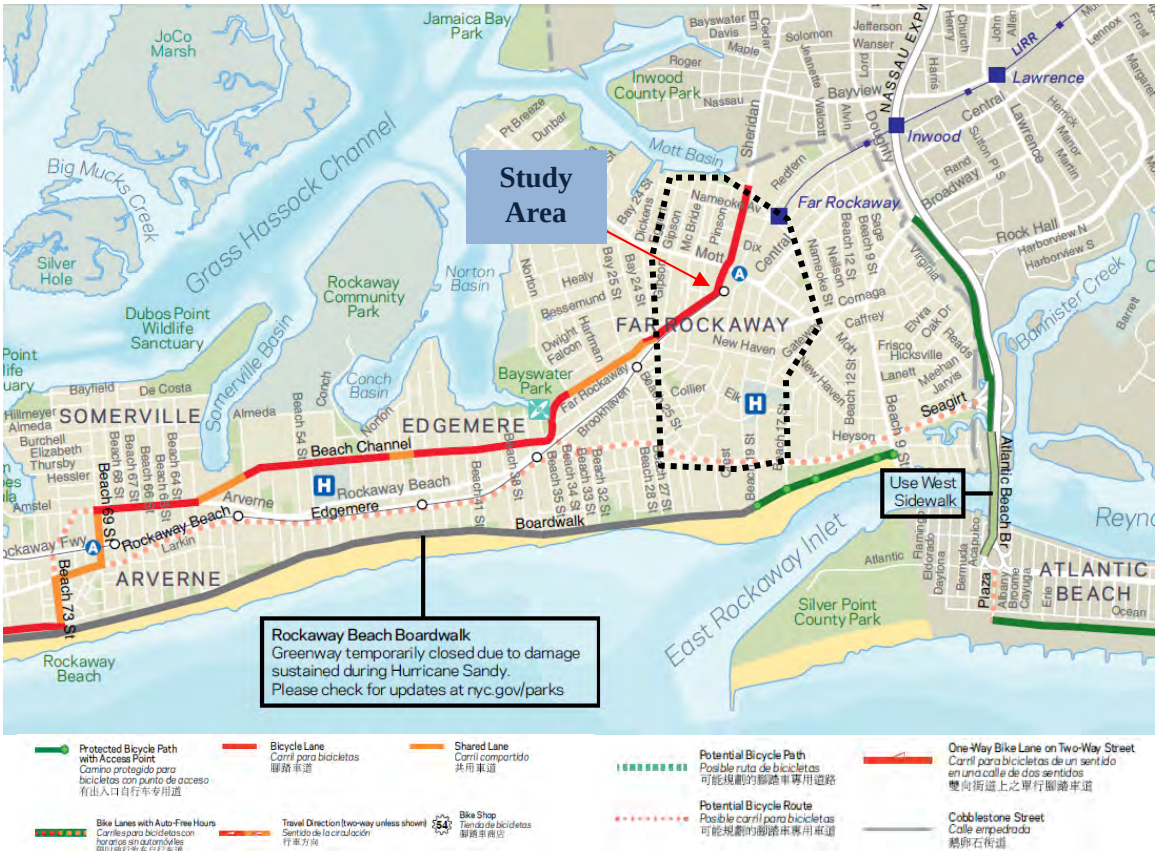
Location	Intersection		AM		PM		Sat	
		Corner	**SF/P**	**LOS**	**SF/P**	**LOS**	**SF/P**	**LOS**
1	Beach Channel Drive @ Mott Ave	NE	278.6	A	240.5	A	239.7	A
		NW	279.4	A	206.7	A	128.6	A
		SE	197.9	A	123.0	A	124.0	A
		SW	425.5	A	248.6	A	231.7	A
2	Beach Channel Drive @ Hassock Street	NE	1595.5	A	518.2	A	701.8	A
		NW	2977.0	A	780.4	A	1102.3	A
		SE	1177.0	A	826.4	A	787.7	A
		SW	583.5	A	388.4	A	326.6	A
3	Mott Ave @ Beach 21st Street	NE	n/a	n/a	n/a	n/a	n/a	n/a
		NW	n/a	n/a	n/a	n/a	n/a	n/a
		SE	97.3	A	60.9	A	72.2	A
		SW	62.8	A	42	B	56.6	B
4	Mott Ave @ Central Ave & Beach 20th Street	NE	173.5	A	117.3	A	172.3	A
		NW	n/a	n/a	n/a	n/a	n/a	n/a
		SE	60.1	A	**27.1**	**C**	40.3	B
		SW	166.3	A	84.5	A	123.4	A
5	Mott Ave @ Cornaga Ave	NE	177.0	A	303.9	A	300.4	A
		NW	249.9	A	253.3	A	414.0	A
		SE	267.5	A	225.4	A	340.2	A
		SW	168.2	A	110.8	A	272.9	A
6	Cornaga Ave @ Beach 9th Street	NE	239.8	A	330.7	A	69.5	A
		NW	186.9	A	202.4	A	91.5	A
		SE	492.4	A	870.0	A	322.0	A
		SW	371.3	A	426.2	A	431.8	A
7	Cornaga Ave @ Beach 19th Street	NE	n/a	n/a	n/a	n/a	n/a	n/a
		NW	n/a	n/a	n/a	n/a	n/a	n/a
		SE	340.1	A	304.5	A	279.5	A
		SW	415.0	A	318.7	A	208.6	A
8	Cornaga Ave @ Beach 20th Street	NE	451.4	A	177.2	A	207.6	A
		NW	337.2	A	132.9	A	145.8	A
		SE	143.0	A	88.8	A	72.1	A
		SW	148.3	A	73.4	A	64.8	A
9	Central Ave @ Nameoke Ave	NE	265.2	A	366.8	A	410.5	A
		NW	183.5	A	353.4	A	413.4	A
		SE	151.9	A	181.3	A	159.0	A
		SW	246.6	A	226.6	A	169.4	A

Red – worst LOS

7.3 Bicycle Facilities

The study area has one bike lane that runs along Beach Channel Drive. It operates as Class 2 or Class 3 in both directions depending on the roadway segment. Between Cornaga Avenue and Hassock Street/Horton Avenue it is mostly a Class 2 standard 5-feet lane, and in some sections it is a shared lane. South of Cornaga Avenue it is buffered with a Class 2 lanes, 8 feet wide. Figure 7-14 shows the current New York City Cycling Map wherein bicycle routes are planned for Seagirt Boulevard.

Figure 7-14: NYC Bicyclist Map



8 Crashes/Safety

The analysis of accidents and safety is an important component of traffic and transportation planning studies, as transportation related accidents can lead to loss of life and/or property damage. The purpose of this analysis is to identify safety issues and if necessary address potential safety problems. To identify locations with potential safety issues, it was necessary first to examine the accident history to see if any patterns exist. The accident analysis was conducted using two approaches.

The first approach focused on the crash data for the study area obtained from New York State Department of Transportation (NYSDOT) between 2010 and 2012 looking at high crash location where there are five or more pedestrian/bicyclist-related accidents or 23 or more reportable crashes. The second approach focused on the study area's main corridors crashes and Killed and Severity Index (KSI) factor using the Traffic Safety Data Viewer DOT software. The injury data for the analyses comes from the New York State Department of Transportation and Motor Vehicle (DMV). The fatality data relies on NYCDOT and NYPD reconciled fatality database.

8.1 Study Area – Reportable Crash Analysis (2010-2012)

Crash data between 2010 and 2012 were obtained to quantify the number of reportable crashes (involving fatality, injury, or property damage $1,000 or more), and yearly breakdown of pedestrian and bicycle related crashes at each location.

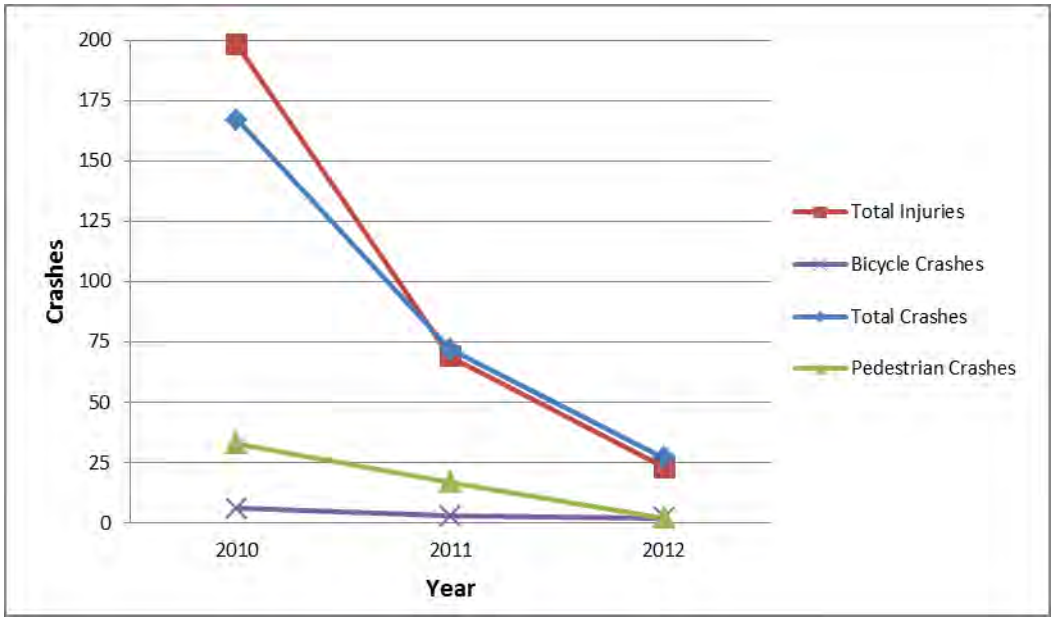
Crash records were examined for 86 intersections in the study area for the period 2010-2012. There were 266 reportable crashes resulting in 290 injuries for the drivers or vehicle passenger, while 52 pedestrian and 11 bicyclists were injured between 2010 and 2012, with no fatalities in the study area, See Table 8-1 and Figure 8-1.

Table 8-1: Crash Summary by Year

Year	Total Crashes	Total Injuries	Pedestrian Crashes	Bicycle Crashes	PD
2010	167	198	33	6	58
2011	72	69	17	3	34
2012	27	23	2	2	11
Total	**266**	**290**	**52**	**11**	**103**

**PD-Property Damage*

Exhibit 8-1: Crashes by Year



The total reportable crashes decreased between 2010 and 2011 by 56% and by 62% between 2011 and 2012, averaging 83% decrease between 2010 and 2012. Injuries, pedestrian and bicycle crashes exhibit a similar pattern.

A high crash location is one where there are five or more pedestrian crashes and/or 23 or more reportable crashes in any one year. After reviewing crashes in the study area one intersection (Mott Avenue and Beach 20th Street) qualify as a high crash location with five pedestrian-related crashes in 2010. See Table 8-2.

Table 8-2: Crash Summary by Year for High Crash Location

Intersection	Total crashes by Year			Total Fatalities	Total Injuries	Pedestrian			Bicycle		
	2010	2011	2012			2010	2011	2012	2010	2011	2012
Mott Ave/Beach 20 St	9	6	3	0	20	5	3	0	1	0	0

Of the five pedestrian crashes in 2010 two were due to pedestrian error, two to driver error, and the cause of one was not identified. Table 8-3 shows a detailed description of each crash at the pedestrian crash location.

Table 8-3: Summary for High Crash Location

Intersection	Crash Summary (3 Year Total)					Collision Type						
	Crashes	Fatalities	Injuries	Peds	Bikes	Wet Road	Night Acc	Rear End	Overtaking	Right Angle	Right Turn	Other
Mott Ave @ Beach 20 St.	**18**	**0**	**20**	**8**	**1**	**3**	**5**	**1**	**2**	**1**	**1**	**10**

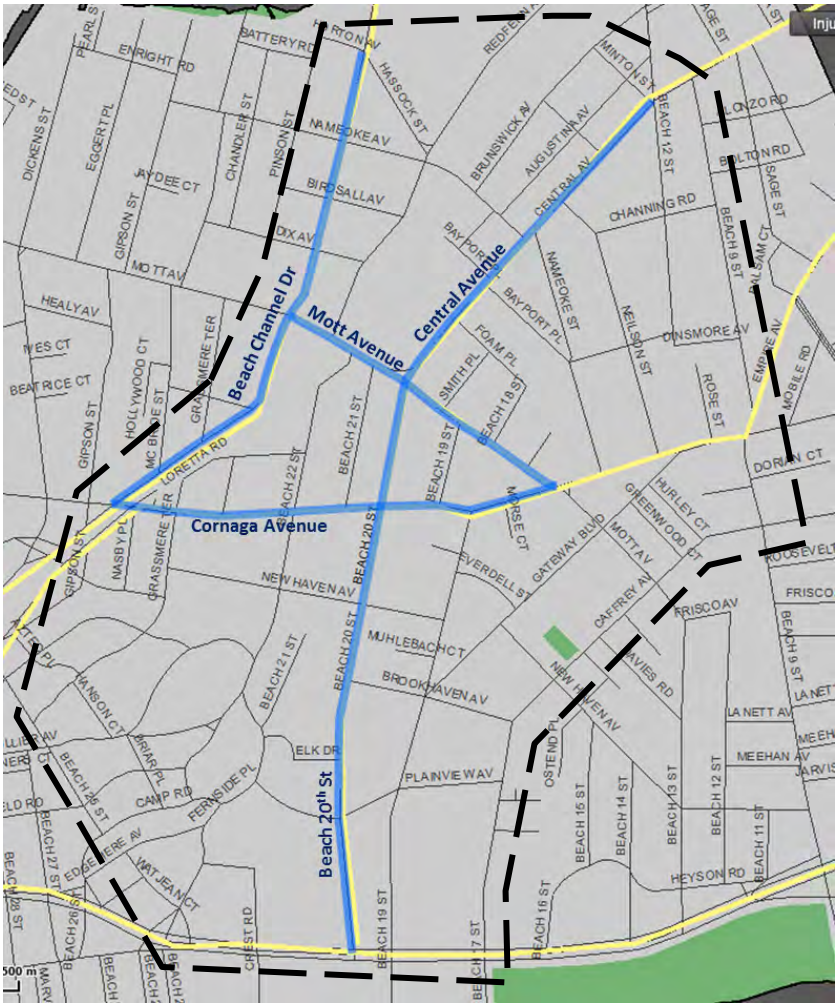
Time of Day			Severity/PDO			
A	M	P	A	B	C	PDO
0	**1**	**2**	**2**	**1**	**13**	**6**

8.2 Crash Analysis Using KSI & Corridor Traffic Safety software

Corridors – Crash Analysis (2007-2011)

The Corridor Traffic Safety software was used to examine crashes along four main corridors in the study area. The five-year (2007- 2011) report includes number and type of injuries, fatalities, mode and the KSI per mile. Figure 8-2 shows the corridors analyzed and Table 8-4 summaries the crash data for each corridor.

Figure 8-2: Corridors in the Study Area



Legend: Corridor Segments Analyzed Main Corridors

Table 8-4: Crash Summary by Corridors (2007-2011)

Corridor	Length (miles)	# Crashes	#Injuries	#Severe Injuries	Fatality	KSI
Mott Avenue	**0.4**	**127**	**112**	**6**	**0**	**17.0**
Cornaga Avenue	**0.5**	**76**	**81**	**12**	**0**	**24.2**
Beach Channel Drive	**0.6**	**150**	**175**	**10**	**0**	**16.6**
Central Ave-Beach 20 St	**1.1**	**124**	**124**	**7**	**0**	**6.60**

KSI is given per mile

Corridor No 1: Mott Avenue *between Beach Channel Drive and Cornaga Ave*

Between 2007 and 2011, Mott Avenue had 127 crashes, 40 involving pedestrians, 7 bicyclists and 80 motor vehicles. The intersection with the highest number of crashes was Mott Avenue @ Beach Channel Drive with 49, followed by Mott Avenue @ Central Avenue/Beach 20th Street with 22, and Mott Avenue @ Cornaga Avenue in third place with 15 crashes, see Figure 8-3. Almost 50% of the total crashes occurred during 12PM and 6PM.

Figure 8-3: Crashes on Mott Avenue (2007-2011)

Route length: 0.4 miles

Of the 112 total injuries, six were severe. There were 44 pedestrians, 8 bicyclists and 60 motor vehicle-occupant injuries, with no fatalities. The KSI for the corridor was 17, which ranked in the top 10% for Queens. Tables' 8-5a to 8-5c show injuries by mode, severity and year, respectively.

Table 8-5a: Mott Avenue: Injury Summary (2007-2011)

	Total Injuries	Severe Injuries	Fatalities	KSI
Pedestrian	44	1	0	1
Bicyclist	8	0	0	0
Motor Veh Occupant	60	5	0	5
Total	**112**	**6**	**0**	**6**

Table 8-5b: Mott Avenue: Injuries by Severity (2007-2011)

Severity	Pedestrian	Bicyclist	Motor Veh	Total
A	1	0	5	6
B	8	1	1	10
C	35	7	54	96
Total	**44**	**8**	**60**	**112**

Table 8-5c: Mott Avenue: Injuries by Year (2007-2011)

Year	Pedestrian	Bicyclist	Motor Veh	Total
2007	10	1	3	14
2008	3	0	6	9
2009	9	3	18	30
2010	15	4	24	43
2011	7	0	9	16
Total	**44**	**8**	**60**	**112**

Corridor No 2: Cornaga Avenue *between Beach Channel Drive and Mott Ave*

Cornaga Avenue had a total of 76 crashes, involving 13 pedestrians, 1 bicyclist and 62 motor vehicles. The two intersections with the highest number of crashes on Cornaga Avenue were Rockaway Freeway and Mott Avenue with 15 crashes each, followed by Beach 20th Street with 12 crashes. See Figure 8-4.

Figure 8-4: Crashes on Cornaga Avenue (2007-2011)

Route length: 0.5 miles

Cornaga Avenue had 81 total injuries where 12 were severe. There were 13 pedestrians, 1 bicyclist and 67 motor vehicle occupants injured, with no fatalities. The KSI for the corridor was 24.2 which also ranked in the top 10% for Queens. Tables 8-6a to 8-6c show the injuries by mode, severity, and year, respectively.

Table 8-6a: Cornaga Avenue: Injury Summary-2007-2011

	Total Injuries	Severe Injuries	Fatalities	KSI
Pedestrian	13	0	0	0
Bicyclist	1	0	0	0
Motor Veh Occupant	67	12	0	12
Total	**81**	**12**	**0**	**12**

Table 8-6b: Cornaga Avenue: Injuries by Severity-2007-2011

Severity	Pedestrian	Bicyclist	Motor Veh	Total
A	0	0	12	12
B	4	0	3	7
C	8	1	51	60
Total	**13**	**1**	**67**	**81**

Table 8-6c: Cornaga Avenue: Injuries by Year-2007-2011

Year	Pedestrian	Bicyclist	Motor Veh	Total
2007	2	0	27	29
2008	1	0	8	9
2009	4	0	11	15
2010	5	0	13	18
2011	1	1	8	10
Total	**13**	**1**	**67**	**81**

Corridor No 3: Beach Channel Drive *between Cornaga Avenue and Hassock Street*

Beach Channel Drive, one of the main north-south corridors had 150 crashes, involving 22 pedestrians, 5 bicyclists and 123 motor vehicles. The intersection with the highest number of crashes was Mott Avenue with 49, followed by Hassock Street with 28, and Dix Avenue with 23; see Figure 8-5.

Figure 8-5: Crashes on Beach Channel Drive (2007-2011)

Route length: 0.6 miles

Of a 175 total injuries on the corridor, ten were severe; the injuries involved 27 pedestrians, 5 cyclists, and 143 motor vehicle occupants; there were no fatalities. The KSI for the corridor was 16.6 which ranked in the top 10% for Queens corridors. Tables 8-7a to 8-7c show the corridor injuries by mode, severity and year, respectively.

Table 8-7a: Beach Channel Drive: Injury Summary (2007-2011)

	Total Injuries	Severe Injuries	Fatalities	KSI
Pedestrian	27	1	0	1
Bicyclist	5	0	0	0
Motor Veh Occupant	143	9	0	9
Total	**175**	**10**	**0**	**10**

Table 8-7b: Beach Channel Drive: Injuries by Severity (2007-2011)

Severity	Pedestrian	Bicyclist	Motor Veh	Total
A	1	0	9	10
B	6	1	4	11
C	20	4	125	149
Total	**27**	**5**	**143**	**175**

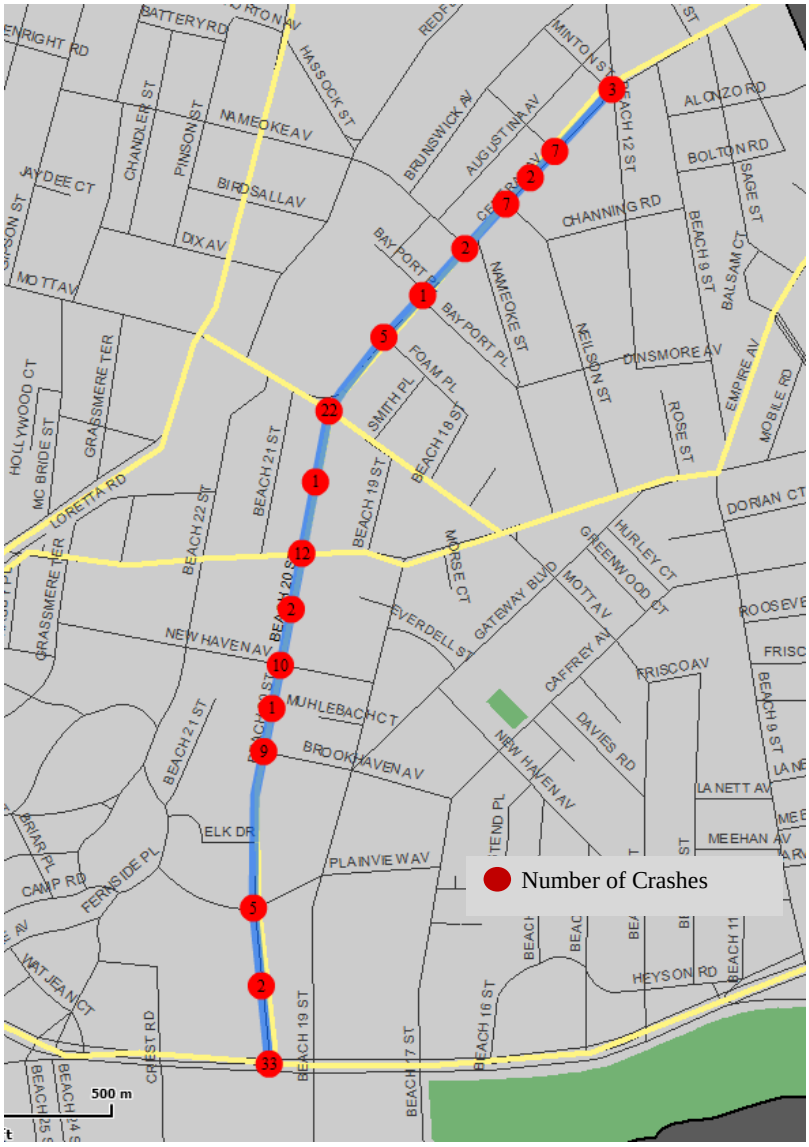
Table 8-7c: Beach Channel Drive: Injuries by Year-2007-2011

Year	Pedestrian	Bicyclist	Motor Veh	Total
2007	5	0	7	12
2008	2	0	6	8
2009	9	4	47	60
2010	8	1	65	74
2011	3	0	18	21
Total	**27**	**5**	**143**	**175**

Corridor No 4: Central Avenue/Beach 20th Street *between Minton St & Seagirt Boulevard*

Central Avenue/Beach 20th Street a main north-south corridor that provides access to Nassau County to the north and the beach which is parallel to Seagirt Boulevard to the south. The 1.1 miles corridor had 124 crashes involving 29 pedestrians, 5 cyclists and 90 motor vehicle occupants. The intersections with the highest number of crashes were at Seagirt Boulevard and Mott Avenue with 33 and 22 crashes, respectively; see Figure 8-6.

Figure 8-6: Crashes on Central Ave/Beach 20th St (2007-2011)



Route length: 1.1 miles

Of the 124 injuries on this corridor, seven were severe with no fatalities. There were 30 pedestrians, 6 cyclists and 88 motor vehicle occupant injuries. The KSI for the corridor was 6.6 which ranked in the top third for Queens. Tables 8-8a to 8-8c show the injuries by mode, severity and year, respectively.

Table 8-8a: Central Ave/Beach 20th St: Injury Summary (2007-2011)

	Total Injuries	Severe Injuries	Fatalities	KSI
Pedestrian	30	2	0	2
Bicyclist	6	0	0	0
Motor Veh Occupant	88	5	0	5
Total	**124**	**7**	**0**	**7**

Table 8-8b: Central Ave/Beach 20th St: Injuries by Severity (2007-2011)

Severity	Pedestrian	Bicyclist	Motor Veh	Total
A	2	0	5	7
B	9	1	3	13
C	19	5	79	103
Total	**30**	**6**	**88**	**124**

Table 8-8c: Central Ave/Beach 20th St: Injuries by Year (2007-2011)

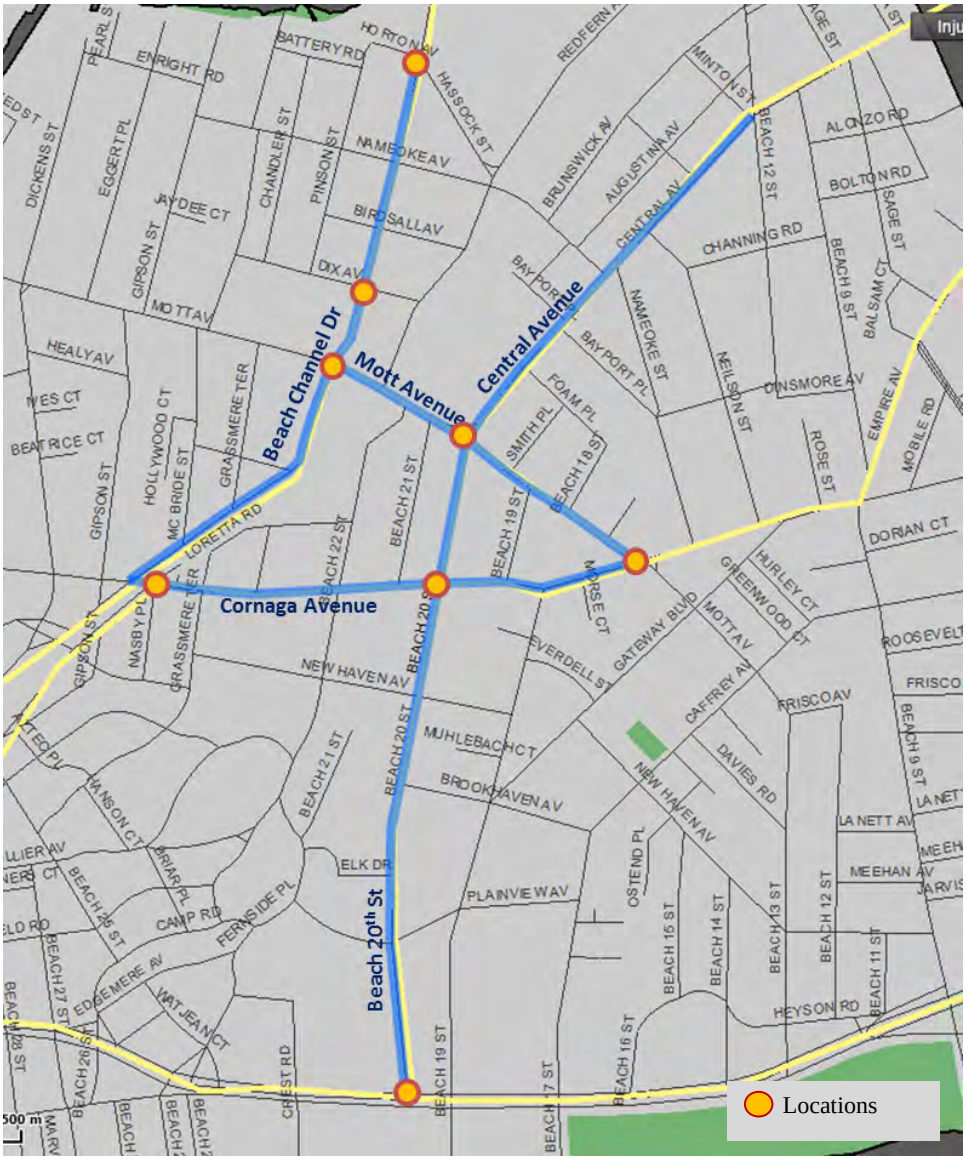
Year	Pedestrian	Bicyclist	Motor Veh	Total
2007	5	0	9	14
2008	0	0	8	8
2009	6	2	32	40
2010	12	3	27	42
2011	7	1	12	20
Total	**30**	**6**	**88**	**124**

Crash Summary:

Based on the intersection and corridor crash analysis there are not high crash locations in the study area. However, relative to other locations in the study are these eight locations below experienced more than normal and will be study further to enhance safety and improve traffic and pedestrian circulation, see Figure 8-7. Some of these locations were also identified by NYPD for special attention.

1. *Mott Avenue @ Hassock St*
2. *Mott Avenue @ Dix Avenue*
3. *Mott Avenue @ Beach Channel Drive*
4. *Mott Avenue @ Beach 20th St/Central Avenue*
5. *Mott Avenue @ Cornaga Avenue*
6. *Cornaga Avenue @ Beach 20th St*
7. *Cornaga Avenue @ Rockaway FRW*
8. *Beach 20th St @ Seagirt Boulevard*

Figure 8-7: Potential Safety Improvement Locations



9 Public Participation and Community Input

Field Meeting with NYPD, April 4, 2013

Participants: NYPD -101 Precinct (Commander Officer and Mr. Michael Hartman), Pedestrian Group (Sean Quinn and Julio Palleiro), Traffic Planning (Milorad Ubiparip, Carren Simpson, Michael Griffith and Eva Marin), and Queens's Borough Office (Albert Silvestri).

The objective of the field meeting was to hear NYPD concerns and issues in regards to pedestrian safety, accidents and traffic operation in the area. The following locations were inspected and discussed:

Location 1: Beach Channel Drive @ Mott Avenue

NYPD explained that this location has the highest accidents in the area, though low compared to other precincts. Most accidents occur at the center of the intersection. There are buses making the SB left from Beach Channel Drive onto Mott Avenue; also Beach Channel Drive is a truck route and the intersection is generally congested. They expressed concerns about the bike lane (which they and the Community Board did not support) and noted bike volumes and bike accidents in general are very low at this intersection. NYPD requested that DOT explore having a leading/lagging phase for Mott Avenue (EB/WB approach) as this might eliminate some left turn conflicts. They also requested a pedestrian countdown signal. DOT needs to analyze and evaluate various options for the intersection including safety education programs for the community.

Location 2: Mott Avenue @ Beach 22nd Street

NYPD explained that there are high pedestrian volumes as people enter and exit the train station heading to various destinations, including the shopping center on Mott Avenue and the municipal parking/bus terminal on Beach 22nd Street. The location is unsignalized and does not have crosswalks; NYPD wants efforts to increase pedestrian safety to be taken.

Location 3: Mott Avenue @ Beach 21st Street

This location also has heavy pedestrian volume, a bus stop and the entrance (an active driveway) to the shopping center that is signalized. There are many dollar vans on Beach 21st Street picking up and dropping off passengers. Although NYPD has tried to enforce the law with respect to vans in the bus stop, there are still drivers who violate the law and many people using the service. DOT needs to examine the feasibility of moving the stop bar back on the EB approach to facilitate buses turning onto WB Mott Avenue and the installation of high visibility crosswalks.

Location 4: Mott Avenue @ Central Avenue/Beach 20th Street

NYPD would like pedestrian countdown signals to be installed at this location, which has high pedestrian volumes and many buses. DOT would study feasibility of installation of yield signs on the pavement for pedestrian crossing.

Location 5: Cornaga Avenue @ Beach 20th Street

NYPD pointed out that there are many buses at this intersection, and there are some pedestrian accidents. There is the Teens' Library and a community counseling center (Horizon) at this location. To improve safety and reduce conflicts, the stop bar on the EB approach should be moved back to facilitate bus turning maneuvers, install countdown pedestrian signals, and restripe all approaches.

Location 6: New Haven Avenue @ Beach 20th Street

This location also experiences some pedestrian accidents, it has a church/school on one corner and it is one block from St John's Episcopal Hospital.

Location 7: Brookhaven Avenue @ Beach 20th Street

This is a "T" intersection with Beach 20th Street operating one-way southbound and Brookhaven Avenue as a two-way east/west street. Brookhaven Avenue is STOP controlled for vehicles making the WB left onto Beach 20th Street which sometimes have difficulty due to a heavy southbound traffic stream. NYPD inquired about the feasibility of signalizing the

intersection as it is in a hospital zone. Some traffic at the intersection originates from a St. John's Hospital employee parking lot (capacity of about 210 spaces).

NYPD pointed out that emergency vehicle access to the hospital is circuitous as emergency vehicles have to take Beach 19th Street to go north, then turn left on Brookhaven Avenue, and left again onto Beach 20th Street to get to the emergency room entrance; this circuitous route prolongs the response time. Beach 20th Street is narrower between Brookhaven Avenue and Plainview Avenue, making two-way operation very unlikely.

Location 8: Plainview Avenue @ Beach 20th Street

Beach 20th Street south of Plainview Avenue operates as a two-way street to Seagirt Boulevard. Northbound traffic has to make a right or left to continue further north. As previously stated, vehicles going to the hospital must make a right, then left onto Beach 19th Street, and left on Brookhaven Avenue to get back on Beach 20th Street SB. There is a lot of truck loading and unloading activity on the west curb of Beach 20th Street between Plainview Avenue and Seagirt Boulevard (adjacent to the shopping center).

Location 9: Seagirt Boulevard @ Beach 20th Street

This is a "T" intersection with high pedestrian volumes, including a high number of elderly pedestrians. There is a 15 feet wide concrete center median on Seagirt Boulevard. The median can be redesigned to enhance pedestrian safety. NYPD indicated that the absence of an EB traffic signal is confusing.

Location 10: Beach Channel Drive @ Hassock Street

This location is very close to the border with Nassau County. In Nassau County, Beach Channel Drive southbound has two lanes, but on approaching Queens County the road merges to one lane. There are no signs informing drivers about the upcoming merge, thus causing unsafe weaving. Traffic volume from Nassau County is very high. Just north of this intersection on the east curb there is a residential parking lot with a curb cut for two-way traffic. NYPD indicated that drivers exiting the parking lot with the desire to head south

(make left) have a long wait because the SB traffic is heavy. Investigate the feasibility of installing appropriate signs.

10 Preliminary Recommendations

Drawing on the analyses, field observation, and community input, the following preliminary recommendations were developed:

1. *Beach Channel Drive @ Mott Avenue*

   Issues: Congestion with high bus volumes en route to bus terminus, limited roadway capacity, and high pedestrian volumes.

   Proposal:

   a. Convert the bike lane on Beach Channel Drive to a shared lane between Regina Avenue and Dix Avenue.
   b. Make signal timing changes to provide a leading/lagging phase to eliminate left turn conflicts.
   c. Restripe intersection to provide a third lane (NB exclusive right).

2. *Beach Channel Drive @ Hassock Street (Nassau/Queens Border)*

   Issues: The roadway in Nassau County has two moving lane for southbound traffic but reduces to one lane in Queens. Without appropriate signs, there is weaving and congestion.

   Proposal:

   a. Provide overhead lane reduction signs on the Nassau side with appropriate striping. Continue transition stripping on the Queens side.

3. *Seagirt Boulevard @ Beach 20th Street*

   Issues: Seagirt Boulevard is a very wide roadway with a center median that is not ADA compliant. The absence of an EB left signal causes some confusion.

   Proposal:

   a. Redesign center median with ADA compliant ramps and install appropriate signal heads.

4. *Mott Avenue between Beach Channel Drive and Cornaga Avenue*

   Issues: Congested roadway segment with high bus volumes en route to or from the bus terminus. Limited roadway capacity with parking permitted in some sections, along with high pedestrian volumes.

   Proposal:

   a. Restripe all intersection approaches.
   b. Relocate stop bars to facilitate bus turning maneuvers.
   c. Redesign crosswalks to facilitate safe pedestrian crossing.
   d. Where feasible, install pedestrian fences in the vicinity of the Mott Avenue train station to direct pedestrian to designated crosswalks.
   e. Remove decommissioned parking meter poles to provide more sidewalk space.

5. *Cornaga Avenue between Beach Channel Drive and Beach 20th Street*

   Issues: At Beach 20th Street there is a high volume of buses turning from Beach 20th Street on Cornaga Avenue with limited turning radius. High pedestrian volumes also occur at this location due to bus stop and commercial activity. The sidewalks along some sections of the corridor are in a state of disrepair.

   Proposal:

   a. Restripe all approaches.
   b. Relocate stop bars to facilitate bus turning maneuvers at Beach 20th Street and Cornaga Avenue EB.
   c. Reconstruct sidewalks.

General Recommendations:

1. Install pedestrian countdown signals at locations to be identified.
2. Develop detailed design drawings and signal timing plans for the implementation phase of the study/project.

11 Conclusion

The Far Rockaway CBD Traffic Study was initiated in response to community and elected officials request for action to upgrade the area's transportation infrastructure to spawn economic revitalization. The transportation agencies (NYCDOT, LIRR & MTA) were charged to make short-term improvements to their facilities. The need for a long term planning effort was also emphasized. This study represents a first step in that process.

Another role of the study was to provide input for a broader urban design/master plan initiative being under taken by NYC DOT and EDC.

Finally the study examined existing traffic conditions including pedestrian/vehicles conflicts, accidents, roadway capacity and traffic controls among others to develop improvement measures to reduce congestion and enhance safety.

These recommendations which include signal timing changes, geometry changes and pedestrian improvements will be evaluated for feasibility and later implementation. Detailed plans for implementation will be developed.