Southern Brooklyn Transportation Investment Study

Kings County, New York
P.I.N. X804.00; D007406

Technical Memorandum #2
Existing Conditions

DRAFT
June 2003

Submitted to:
New York Metropolitan Transportation Council

Submitted by:
Parsons Brinckerhoff

In association with:
Cambridge Systematics, Inc.
SIMCO Engineering, P.C.
Urbitran Associates, Inc.
Zetlin Strategic Communications

TABLE OF CONTENTS

List of Tables

List of Figures

Executive Summary

The Southern Brooklyn Transportation Investment Study (TIS) is a multimodal transportation planning study addressing transportation issues in the southern half of the Borough of Brooklyn, New York City. The TIS is intended to assess current and future travel conditions and deficiencies, and develop multimodal transportation improvement alternatives that address the movement of people and goods within and through the study area. The study takes an area-wide approach, and is grounded in extensive community outreach.

This Technical Memorandum provides information to support the formulation of alternative transportation improvement scenarios. It examines public transportation, goods movement, socioeconomic conditions, environmental conditions, bicycle and pedestrian transportation, traffic conditions and accidents and safety conditions within the study area. John F. Kennedy International Airport (JFKIA) comprises the TIS's supplemental study area. The data collected and described in this Technical Memorandum complements input received from the public through Local Area Visioning meetings; e-mail, telephone and faxed comments; resident and business focus groups; and an Interactive Survey posted on the project's website (www.southernbrooklyntis.com).

A. TRANSIT SYSTEM USAGE AND OPERATION

The Southern Brooklyn study area is served by a variety of transit modes that provide residents with a number of options for traveling within Brooklyn, connecting to other boroughs and accessing the region beyond New York City. These transit modes include subways, buses, ferries, commuter vans and jitneys. Several Park and Ride lots in the region offer access to these modes. Commuter rail services in the region do not directly serve the Southern Brooklyn area.

In terms of rapid transit in the study area, ridership data assembled included annual and average daily boardings by subway station, as well as ridership by time of day. There is a lack of rapid transit in the southeastern part of the study area, including lower Nostrand Avenue, lower Flatbush Avenue, and Utica Avenue, which in part contributes to heavy utilization of the stations closest to this area, which are the Brighton Avenue (Q) Line stations (approximately 100,000 riders per day), as well as the Brooklyn College-Flatbush Avenue station on the Nostrand Avenue (Nos. 2 and 5) Line (approximately 18,000 riders per day). Other subway issues include creating additional subway-to-subway transfers, temporary capacity constraints caused by the Manhattan Bridge construction to be completed in 2004, and the potential for greater utilization of express tracks on many of the subway lines which provide service in Southern Brooklyn.

There are 47 local, limited, and express bus routes in operation through the Southern Brooklyn study area, including five routes that are among the top ten most utilized routes in the city. These include three north/south routes – B41, B44, and B46 – that serve three major corridors lacking subway service. All three of these routes average greater than

40,000 passengers per day, which exceed the ridership on some light rail lines in other cities. Other surface transit issues that have been preliminarily identified include slow operating speeds averaging eight miles per hour for routes in the project area, instances of passenger crowding on buses at peak times, and the lack of amenities at many bus stop locations.

Additional modes and facilities, including jitney vans, ferries, and park and ride lots were investigated. Jitney van activity was observed at locations throughout the study area. At each of three of those locations (Flatbush/Church, Flatbush/Nostrand and Kings Plaza), there were 75 instances of jitney van activity in a three-hour period. This emphasizes the demand for transit and the lack of direct subway access in the southeastern portion of the study area. Jitney vans are filling a need in these areas, but were observed to operate in ways that cause impediments to the transportation network, such as double parking and standing in bus stops.

Despite its extensive waterfront, ferries serve only one location the TIS study area. Brooklyn Army Terminal to Lower Manhattan ferry service was initiated shortly after September 11, 2001. Initial data collected indicate that the service is viable, which raises the possibility of additional service at locations in the study area.

There are eight Park and Ride lots in the study area, which provide opportunities for commuters to access transit facilities. Most of these lots are currently underutilized.

A number of preliminary general issues have emerged related to transit as a result of a literature review, on-site observations, public outreach and agency correspondence and data sources. These include the following:

- Lack of rapid transit service along major corridors in Southern Brooklyn
- Underutilization of express subway track capacity
- Planning for increased subway capacity on Manhattan Bridge after construction is complete
- Need for increased transfer opportunities between subway lines
- Passenger crowding on bus routes
- Slow bus operating speeds
- Need for bus stop amenities
- Proliferation of jitney services
- Potential to increase ferry service in Southern Brooklyn
- LIRR Brooklyn Branch reverse commute service
- Improved connections to JFKIA
- Service to Gateway Estates, a new commercial-residential development
- Underutilization of Park and Ride Lots

B. GOODS MOVEMENT

Freight distribution in the Southern Brooklyn study area is served by highway, rail, and waterborne modes. The highway system consists of an extensive network of secondary

streets and a less extensive system of primary arterials and limited access highways. Of the approximately 780 road miles of streets and highways in the study area, roughly 63.7 miles, or 8.2 percent, are legally designated truck routes. Approximately 7 percent of the total road miles are available for local truck use and roughly 1 percent – principally I-278, Prospect Expressway, and Flatbush Avenue – are available for through truck use. The rail system within the study area consists of approximately 6.5 miles of the Bay Ridge Branch, a freight rail line connecting the South Brooklyn waterfront with Fresh Ponds Yard in Queens. Rail service in the study area is limited – with approximately seven trains each week moving freight for customers in Brooklyn to and from the float bridge across New York Harbor to New Jersey and to Queens where freight makes connections to West-of-Hudson origins and destinations. There are no public (i.e., facilities that serve multiple freight shippers and carriers) marine cargo terminals in the SBTIS study area. However, there are three public marine cargo facilities elsewhere in Brooklyn that impact, to a limited extent, the SBTIS study area. Those terminals are the Red Hook Marine Terminal, the Brooklyn Marine Terminal, and the South Brooklyn Marine Terminal. In addition to public facilities, there are 52 privately owned marine terminals and special purpose publicly owned facilities (Navy, Coast Guard, and New York City Department of Sanitation) within Kings County. Air cargo facilities at nearby JFKIA directly impact Southern Brooklyn by generating truck trips through the study area.

Analysis of commodity flow data for the Borough shows that over 143 million tons of freight valued at $353 billion moved inbound, outbound, through, and within Brooklyn in 2000. The top commodity class by tonnage is petroleum and coal products. The next highest tonnage classes are food and kindred products; and clay, concrete, glass, and stone products. The highest value commodity classes are machinery, apparel, and food and kindred products. The top direction of movement is inbound, accounting for 45 percent of total tonnage. Outbound, through, and internal movement of freight account for 39 percent, 15 percent and 1 percent, respectively, of the total tonnage. Trucks carry greatest amount of freight of any mode, with 76.2 percent of the tonnage and 94.6 percent of the total value. Waterborne freight movement is second and rail is third representing 27.2 percent and 0.5 percent of the total tonnage, respectively. The commodity flow analysis also reveals that Northern New York State, the U.S. Midwest, and the Southern Tier of New York State are the largest external trading regions with Brooklyn beyond the NYMTC region. Within the NYMTC region, New York (NY), Hudson (NJ), Bergen (NJ), Essex (NJ), and New Haven (CT) counties are the top regional trading partners.

Analysis of a trip table of auto and truck activity in the study area created from the NYMTC Best Practices Model reveals concentrations of freight trip generation within Southern Brooklyn. Specifically, the model data reveal that traffic analysis zones (TAZs) near the Kings Plaza Shopping Area, Brooklyn Terminal Market, and Fort Hamilton area have the highest estimated truck activity in terms of inbound and outbound tonnage and percentage of trucks. A database of freight related business locations affirms the concentrations of freight activity in the study area and shows several additional freight activity centers in Southern Brooklyn.

Interviews and focus group activities with freight system users – including outreach activities from related studies – identified the following types of issues and concerns in the study area: poor truck access and vertical clearance at elevated rapid transit structures; inadequate signage; problems with truck rules enforcement; traffic congestion; and environmental and safety issues.

C. SOCIOECONOMIC CONDITIONS

The TIS primary study area comprises nearly half of the Borough of Brooklyn and houses a population of 1.2 million. Its diverse neighborhoods range from low-scale single-family home neighborhoods – such as Dyker Heights, Marine Park, and Mill Basin – to higher density neighborhoods such as portions of Coney Island, Flatbush, and Starrett City. The character of the area is defined by historic neighborhoods and corridors, such as Ocean Parkway and Kings Highway, and world class recreational and entertainment attractions, such as the Coney Island Boardwalk and Amusement Park, and Gateway National Recreation Area. Its waterfront, while not easily accessible to some inland communities, provides a wealth of natural resources and a distinct maritime character in areas such as in Sheepshead Bay.

The study area experienced a greater increase in population between 1990 and 2000 (11 percent) than Brooklyn (seven percent) or New York City (nine percent), and has grown increasingly diverse in its racial and ethnic composition. The study area has a slightly older population on average than the rest of Brooklyn and New York City, with some neighborhoods having concentrations of residents above the age of 65, such as Bay Ridge, Coney Island and Sheepshead Bay. Households within the study area have slightly higher median incomes on average ($38,447) than the rest of Brooklyn and have higher rates of multiple-vehicle ownership (52 percent). While the most popular mode of commutation for workers in the study area is transit (52 percent), a higher percentage of workers within the study area commuted to work by automobile (40 percent) than in Brooklyn as a whole, or New York City (32 percent and 26 percent, respectively).

The primary study area also contains major employment sites, such as numerous hospitals and several colleges, Kings Plaza, which is one of the largest shopping centers in New York City, and the Brooklyn Terminal Market, a major food distribution facility. Land use in the study area, while primarily residential, also includes mixed use corridors and neighborhoods, such as Borough Park, and the Spring Creek and Old Mill Creek neighborhoods, where industrial uses are interspersed with residences in some locations. Recent development has focused on waterfront areas, with the introduction of big box type retailers such as Home Depot, and the largest retail development in the Borough in decades – Gateway Estates Shopping Center. Gateway Estates in particularly, which opened in October 2002 with nearly half a million square feet of retail space, presents issues related to transit accessibility for its patrons, and for its total of 1,700 employees. Other recent developments, such as Keyspan Stadium, have increased the range of attractions in southern Brooklyn. For the Coney Island and Gravesend vicinity, a New York City Department of Transportation sustainable development transportation study

now underway will address growing traffic problems in these communities and address development issues.

D. ENVIRONMENTAL CONDITIONS

Environmental issues for consideration in the development and evaluation of alternative transportation improvements include types and locations of community facilities, sensitive land uses, cultural resources, visual resources, air quality, noise, vibration, natural resources, hazardous materials and the locations of minority, low income and disabled populations for environmental justice considerations. Major activity generators within the study area include cultural and entertainment facilities such as the New York Aquarium, Canarsie Pier, and Gateway National Recreation Area; colleges including Brooklyn College and Kingsborough Community College; hospitals such as Coney Island Hospital, Kings County Hospital and SUNY Downstate Medical Center, and retail centers such as Kings Plaza. The area contains numerous historic resources, including three historic districts, and one of the oldest homes in New York City, the Pieter Claeson Wycoff House (circa 1652). Southern portions of the study area along the waterfront have also been identified as being archeologically sensitive, with evidence of prehistoric occupation in some areas. Visual resources include scenic waterfront vistas, as well as Ocean Parkway, which are protected by a Special Purpose zoning district. Other special purpose districts present that are intended to protect the area's unique community character include the Special Bay Ridge District, the Special Sheepshead Bay District and the Coney Island Special District.

Environmental concerns that have been inventoried include superfund sites such as the Brooklyn Gas Works site, and former landfill sites adjacent to the Belt Parkway that are now being remediated and prepared for use as parkland. Air Quality concerns have been expressed by community members, particularly in areas that are impacted by transportation, industrial and distribution-related uses, such as the eastern portion of the study area. Concerns over noise from flight paths have also been expressed, such as along Ocean Parkway.

E. ACCIDENTS AND SAFETY

Accident patterns show that certain roadway corridors in Southern Brooklyn are more accident-prone than others. Preliminary analyses reveal that these corridors are primarily major roadways and truck routes. While the top 120 high accident locations represent only 1 percent of all accident locations, the number of accidents that occurred at these top high accident locations accounts for 13 percent of the total accidents within the Southern Brooklyn study area. This finding shows that these high accident locations, having a disproportionate amount of accidents, are more accident-prone than other accident locations within Southern Brooklyn.

F. PEDESTRIAN/BICYCLE TRANSPORTATION

With the exception of Belt Parkway and the Gowanus Expressway, cyclists and pedestrians share Southern Brooklyn's entire local and arterial street network with motorists. Many cyclists even use major arterials such as Flatbush Avenue and Linden Boulevard for their connectivity and centrality. In addition, cyclists have a formal bicycle network in Southern Brooklyn of signed routes (Class III facilities), marked on-street bike lanes (Class II facilities), and physically separated, off-street bicycle paths (Class I facilities). The pedestrian network in Southern Brooklyn includes sidewalks, intersections, and multiuse paths. As with bicycling, pedestrian activity is extant across the study area, but is particularly concentrated along the busy shopping corridors, around subway stations, and adjacent to intermodal stops.

Development of the greenway and bicycle lane network by the New York City Department of Transportation in Southern Brooklyn has focused on reconstructing deteriorated sections, closing gaps between existing greenway segments, expanding the current greenway routes, and establishing an on-street network. Efforts to improve the pedestrian network in Southern Brooklyn have focused on improving safety and access adjacent to transit nodes and along retail corridors, and installation of pedestrian ramps at crosswalks.

Cycling and walking are increasingly popular ways to get to work for people in Southern Brooklyn. According to the US census, between 1990 and 2000 cycling to work increased by 82 percent and walking increased by 7 percent. The rate of non-motorized commuting is highest in the center of the study area (Community Boards CB12, CB 14 and CB 10) but the greatest numbers of cyclists come from northern end of the study area (CB 17). Despite the increases in walking and cycling, safety continues to be a major concern in many parts of Southern Brooklyn. Pedestrian accidents occurred most frequently along Flatbush Avenue, Nostrand Avenue, Church Avenue, Flatlands Avenue, Bay Parkway, and Linden Blvd. Five of the top 10 most accident-prone locations for bicyclists were on major streets that feed the Shore Parkway Greenway. One of the top 10 bicycle accident locations, the intersection of Caton Avenue and Bedford Avenue, is associated with a bicycle lane.

Safety, comfort and access to transit and retail corridors are other areas of concern for pedestrians in Southern Brooklyn. Bicycle parking at employment centers, retail corridors, and at transit nodes are some of the major issues for cyclists.

A literature search, conversations with agency representatives, and concerns expressed at Local Area Visioning meetings provided information necessary to identify common themes and issues with the current pedestrian and bicycle environment in Southern Brooklyn. Briefly, these include:

- Insufficient or unsafe access to Greenways from the local street network and surrounding communities.
- No bicycle routes in the northeastern section of the study area.
- Accident prone and inhospitable walking and cycling environment of arterials.
- No crosstown bicycle routes.

- Congestion, gaps and barriers in the sidewalk network.
- Through and truck traffic on neighborhood streets.
- Need for increased safety and comfort of access to transit.
- Lack of secure bicycle parking at transit and employment centers.

THE SHORE PARKWAY AND SOUTHERN BROOKLYN WATERFRONT FORM THE SOUTHERN BOUNDARY OF THE SBTIS STUDY AREA

Chapter I: Introduction

A. INTRODUCTION

This Technical Memorandum presents travel and socioeconomic data for the Southern Brooklyn Transportation Investment Study (TIS) study area. It provides an overview of public transportation, goods movement, socioeconomic conditions, environmental factors, traffic conditions, accidents and safety, and pedestrian and bicycle travel in Southern Brooklyn and supplements data collected through Local Area Visioning meetings, focus groups, the internet and other public outreach efforts. Evaluation of this data indicates both the trends that may affect the movement of people and goods in the area, and the factors that will affect decision making over future transportation investments.

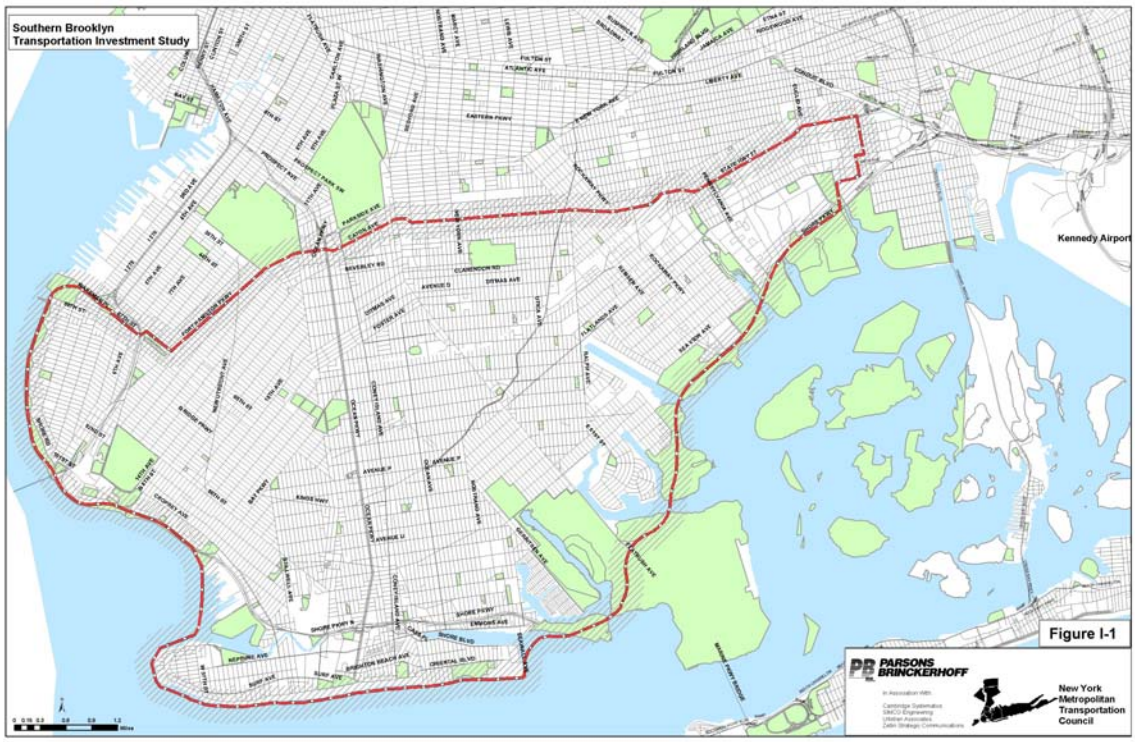
Information and data have been obtained from secondary sources, including relevant recent and on-going agency studies, files, and reports from New York State Department of Transportation (NYSDOT), New York Metropolitan Transportation Council (NYMTC), New York City Department of Transportation (NYCDOT), New York City Economic Development Corporation (NYCEDC), New York City Department of City Planning (NYCDCP), New York City Transportation Coordinating Committee (NYCTCC), Port Authority of New York and New Jersey) PANYNJ, Metropolitan Transit Authority (MTA), and other agencies. Secondary source references are listed in Appendix A. Primary data analyzed includes census data, traffic counts and agency interviews.

B. PROJECT OVERVIEW

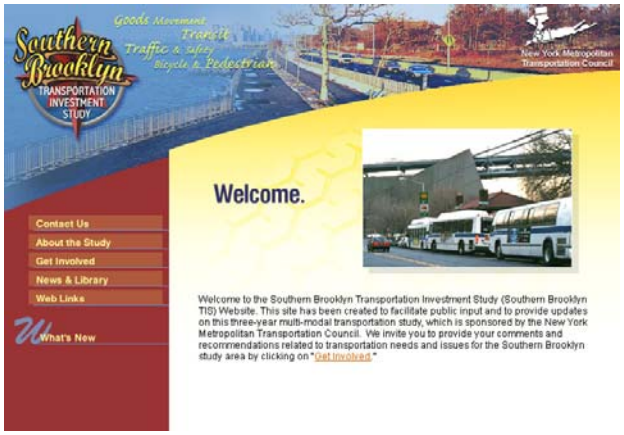
The TIS is a three-year, multimodal transportation planning study being undertaken by the New York Metropolitan Transportation Council (NYMTC). The purpose of the study is to assess current and future travel conditions and deficiencies and develop multimodal transportation improvement solutions that address the movement of people and goods within and through the study area. The study area boundaries are Linden Boulevard, Caton Avenue, Fort Hamilton Parkway, and 66th Street at Owls Head Park on the north; Belt Parkway/Coney Island on the west and south; and the Brooklyn/Queens Line on the east (see Figure I-1, Study Area). All or portions of Brooklyn Community Boards 5, 9, 10, 11, 12, 13, 14, 15, 16, 17, and 18 are included in the study area.

The goals and objectives of the TIS are rooted in a proactive public and community involvement program. Initial efforts for the study have entailed over a dozen Local Area Visioning (LAV) meetings at locations throughout the study area. These inclusive listening and visioning sessions with the general public, elected officials, transportation agencies, local officials, business organizations, and other stakeholders have helped to define the study area's transportation problems and needs. Input from the LAVs, separate resident and business Focus Groups, and comments obtained through the TIS website Interactive Forum and other written submissions of comments will be reviewed by the TIS Technical Advisory Committee (TAC), Community Liaison Committee (CLC), and TAC/CLC Joint Subcommittees to develop options for transportation improvements.

FIGURE I-1
STUDY AREA



The study includes two phases. The first includes the identification of study area issues, concerns, and goals and objectives; and the second, the development, evaluation and recommendation of alternative improvement scenarios. At the conclusion of the study, medium and longer-term alternative improvements will be integrated into a multimodal (bus and rail transit, rail freight, pedestrian, bicycle, auto, truck, and ferry) transportation plan for the study area that meets project goals and objectives. Some immediate and short-term transportation concerns raised through the LAV meetings and other public outreach, such as low-cost site-specific requests that can potentially be implemented within a timeframe of up to approximately three years, have been forwarded to appropriate operating agencies for attention.



THE SOUTHERN BROOKLYN TRANSPORTATION INVESTMENT STUDY IS GROUNDED IN AN EXTENSIVE COMMUNITY OUTREACH PROGRAM

Chapter II: Public Transportation

A. EXISTING TRANSIT INFRASTRUCTURE

1. Subways

a. Background and System Characteristics

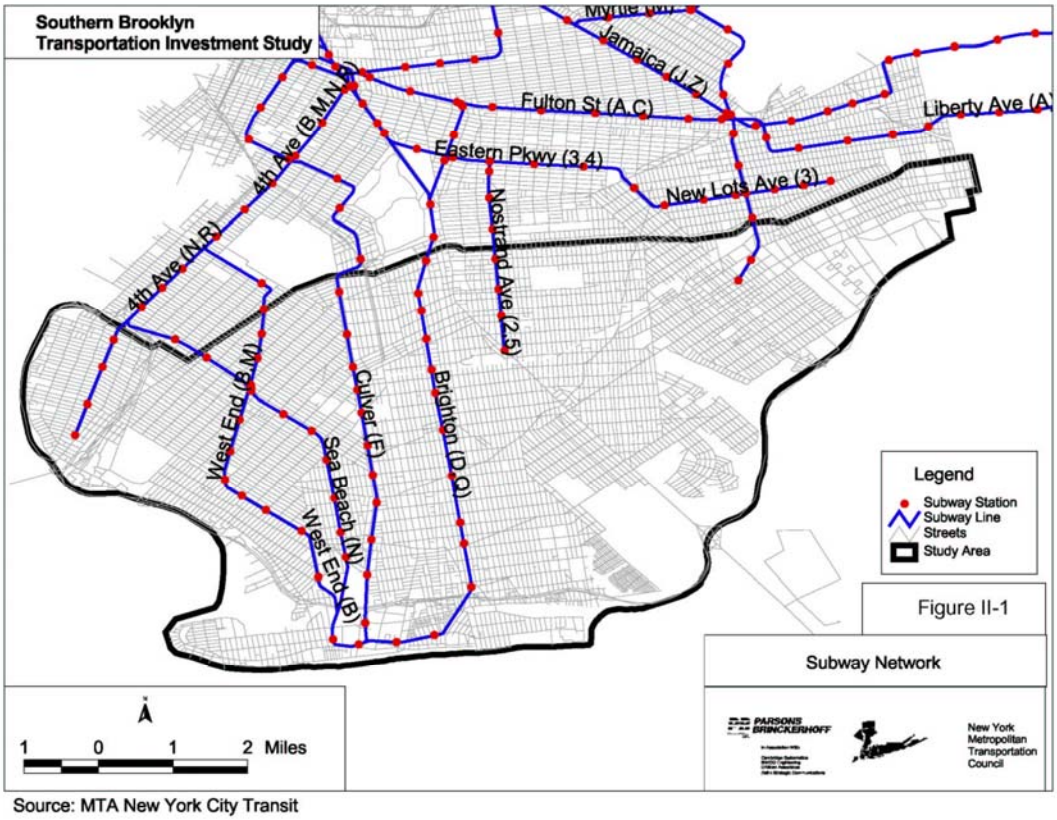
New York City Transit (NYCT), a division of the Metropolitan Transportation Authority (MTA), is the sole provider of subway service in the Southern Brooklyn study area. NYCT (originally the New York City Transit Authority) was created in 1953 to assume responsibility for the subway system and for bus routes formerly run by New York City's Board of Transportation. The MTA is a public-benefit corporation governed by a 17-person Board and chartered by New York State in 1965.

NYCT subways serve 1.3 billion passengers each year, ranking it as the fourth highest among subway systems in the world. The subway lines in Southern Brooklyn, include the Fourth Avenue (R), Sea Beach (N), West End (B, M), Culver (F), Brighton (D, Q), Nostrand (2, 5) and Canarsie (L) Lines, provide significant ridership contributions to overall system totals. A map of the Southern Brooklyn subway network is provided in Figure II-1. Due to construction on the Manhattan Bridge, subway services within the study area underwent major changes as of July 2001 with the W replacing the B on the West End Line and the Q having both local and express operations on the Brighton Line to replace service on the D Line. In addition, the events of September 11, 2001 affected ridership patterns and resulted in the temporary replacement of the No. 3 train by the No. 1 train on the New Lots Avenue Line, just north of the study area. This line is once again served by the No. 3 train, as No. 1 train service to the World Trade Center area was restored in late 2002. Construction on the Manhattan Bridge is scheduled to be complete in 2004. For the purposes of this report, all subway line references are to conditions before the Manhattan Bridge construction and September 11 changes.

b. Subway Line Characteristics

All of the subway lines in Southern Brooklyn were built between 1907 and 1925, mainly by private railroads, eventually taken over by Brooklyn Rapid Transit Company (BRT), which later became the Brooklyn Manhattan Transit Corporation (BMT). The sole exception is the Nostrand Avenue Line, which was constructed by the Interborough Rapid Transit Company (IRT). Many of the lines, specifically the lines that serve Coney Island, actually opened earlier as steam engine lines, carrying passengers from Manhattan and downtown Brooklyn to the recreational areas in Coney Island. Other lines were opened to serve growing areas, and in some instances replaced overhead elevated structures.

FIGURE II-1
SUBWAY NETWORK



Source: MTA New York City Transit

Both local and express subway services are provided in Southern Brooklyn. Local trains stop at all stations on the subway line. Express trains only stop at select stations. Express trains usually operate on a separate track from the local trains, allowing them to bypass local stations. By bypassing numerous stops, express trains provide rapid service from many outlying areas.

The Fourth Avenue/Bay Ridge (R) Line is the final leg of the Fourth Avenue trunk line running north/south in Western Brooklyn. Within the study area this line is completely underground. The line is two tracks throughout the study area, becoming a four-track trunk line north of the study area. The line was originally constructed to allow for four tracks, as well as a potential spur to Staten Island.

The Sea Beach (N) Line was originally a steam railroad operating between New Utrecht Avenue at 62nd Street and the Sea Beach Hotel in Coney Island. This line operates primarily in an open cut, slightly below grade level, with stations constructed into the walls of the cut. The line contains three tracks, as well as an additional abandoned track. South of Kings Highway, there are four tracks, with two of those tracks serving the Coney Island Yard, while the remaining two tracks operate to the Stillwell Avenue station. This line consists solely of local service.

The West End (B, M) Line was another line that started off as a Steam Railroad, which connected New Utrecht Avenue at 65th St and Coney Island. This line was the first one to serve Coney Island. This line operates on an elevated structure throughout the study area, except in the vicinity of the Coney Island Yards, where this line is at grade level. The West End Line contains three tracks, although there is currently no express service.

The Culver (F) Line, also a former steam line, operates from the vicinity of Prospect Park to the Stillwell Avenue terminal. This line is four tracks in the vicinity of Ditmas Avenue, then three tracks to Avenue F. The remainder of the line is two tracks, running to Stillwell Ave. Local service only is offered along the Culver Line. This line operates on an elevated structure throughout the study area.

The Brighton (D, Q) Line was also started as a steam railroad line, connecting Prospect Park with the Brighton Beach area, where the Brighton Hotel was located. This line is four tracks until Ocean Parkway, where it becomes two tracks to its terminus at Stillwell Avenue. Both local and express services are operated along this line. The line operates for most of its length in an open cut just below grade level.

The Nostrand Avenue (Nos. 2, 5) Line is the only IRT line within the study area. This line operates on two tracks throughout the study area. The line is underground throughout its entire length, from the Franklin Avenue Station to the Flatbush Avenue Station. Local service only is provided on this line.

The Canarsie (L) Line began service as a steam railroad, connecting East New York to the Canarsie Pier Beach. The line cut back service in the 1940's to the present terminus at Rockaway Parkway. This line operates on two tracks, at grade level through the study area. Only local service is provided along this line.

c. Service Span & Frequency

The subway lines serving the Southern Brooklyn area operate on schedules that have been developed by MTA-NYCT in an attempt to provide the appropriate level of service based on projected ridership demand. Schedules are primarily based on the day of service (i.e. weekday, Saturday, Sunday) and are adjusted to meet the demand fluctuations resulting from the various time periods that take place during the course of each day (e.g. AM peak, midday, and PM peak). During the weekday morning peak time period (6:00 AM – 9:30 AM), the vast majority of passengers originating from Southern Brooklyn commute to the extensive employment centers of Manhattan, and create demand on northbound subway runs. The midday period (10:30 AM – 2:00 PM) generates relatively balanced demand from northbound and southbound passenger trips. During the PM peak period (3:30 PM– 7:00 PM), commuters create demand on southbound runs on those routes connecting Manhattan with the Southern Brooklyn study area.

Service frequency in Southern Brooklyn varies by time of day and day of the week. Weekday service features morning and afternoon peak headways that range between two and twelve minutes. Midday headways range from two minutes to ten minutes, except for the No. 5 train which does not have any service at all. During weekend periods, headways range from six minutes to 20 minutes, with a number of lines not having any service at all. Information on the span of service and headways for Southern Brooklyn subway service is summarized on Table II-1.

d. Stations and Yards

There are two yards and 54 subway stations in Southern Brooklyn. Yards are used for both maintenance and storage of the subway rolling stock. Stations are where passengers board and alight trains. They also serve as the gateway for the public to the subway system.

The two yards in Southern Brooklyn are the Canarsie Yard and the Coney Island Yard. The Canarsie Yard is located next to the terminal station of the Canarsie Line, Rockaway Parkway, and is used to service trains on that line. The Coney Island Yard is the location where most of the heavy maintenance of subway cars occurs for the entire system. This yard is located adjacent to the Sea Beach and West End Lines, just north of the Belt Parkway.

Three additional yards are located just outside of the study area. The Livonia Yards are located just east of the New Lots Avenue Station in East New York, servicing trains operating along the New Lots Avenue Line. This is the only yard servicing A Division trains (IRT) in Brooklyn; most of the other A Division yards are located in the Bronx. The $36^{th}/35^{th}$ Street yards are located adjacent to the West End Line in Sunset Park and currently service work trains. Another yard that services work trains is the Linden Yards, which are located adjacent to the Long Island Railroad's Bay Ridge Line, just south of the New Lots Avenue Line.

TABLE II-1
SUBWAY SERVICE CHARACTERISTICS

Subway Line	Direction of Travel	Span	Headway (minutes)				
			Weekday			Saturday	Sunday
			AM Peak	Midday	PM Peak		
2 – Nostrand Avenue	Northbound	24 Hours Daily	6 – 8	8	6 – 8	12	12
	Southbound		7 - 9	8	7 - 9	12	12
5 – Nostrand Avenue	Northbound	M-F 6:00 AM – 10:00 AM & 3:30 PM – 9:00 PM	4 – 7	No Service	4 – 7	No Service	No Service
	Southbound		4 – 6	No Service	7 - 10	No Service	No Service
B – West End Line	Northbound	24 Hours Daily	6 – 10	10	9 –12	8	8 –10
	Southbound		7 - 12	10	3 – 9	8	8 – 10
D – Brighton Local	Northbound	24 Hours Daily	6 – 8	10	6 – 8	8	8 – 10
	Southbound		6 - 8	10	6 - 8	8	8 – 10
F – Culver Line	Northbound	24 Hours Daily	4 – 6	6 – 8	4	10	10
	Southbound		4 - 6	6 – 8	4 - 6	10	10
L – Canarsie Line	Northbound	24 Hours Daily	4 – 5	8	4	6	8 – 15
	Southbound		4	8	4 - 6	6	8 – 15
M – West End Line	Northbound	24 Hours Daily	8 – 10	10	10 – 12	9 – 20	9 – 20
	Southbound		8 - 10	10	10	9 – 20	9 – 20
N – Sea Beach Line	Northbound	24 Hours Daily	8 – 10	10	10 – 12	8 – 12	10 – 15
	Southbound		10	10	8 - 10	8	10
Q – Brighton Express	Northbound	M-F 6:00 AM – 9:06 PM	2 – 6	2 – 6	2 – 6	No Service	No Service
	Southbound	M-F 6:50 AM – 10:05 PM	2 - 6	5	3 - 5	No Service	No Service
R – Fourth Avenue Local	Northbound	24 Hours Daily	7 – 9	10	7 – 9	8 – 12	8 – 15
	Southbound		6 – 8	10	7 - 9	8 – 12	10 – 12

Source: MTA-NYCT

TABLE II-2
STUDY AREA SUBWAY INVENTORY

Line Segment	Station	Subway Lines	2000 Total Passengers	Weekday Average
4th Avenue Line	95th Street/Bay Ridge	R	1,481,157	4,935
	86th Street	R	2,435,039	7,857
	77th Street	R	1,289,358	4,329
	Bay Ridge Avenue	R	2,077,842	6,803
	Total		**7,283,396**	**23,924**
West End Line	Bay 50th Street	B	694,850	2,366
	25th Avenue	B	1,152,041	3,931
	Bay Parkway	B, M	1,841,170	6,020
	20th Avenue	B, M	1,273,128	4,167
	18th Avenue	B, M	1,250,669	4,176
	79th Street	B, M	1,349,149	4,598
	71st Street	B, M	1,267,675	4,261
	55th Street	B, M	722,860	2,440
	50th Street	B, M	1,004,297	3,381
	Fort Hamilton Parkway	B, M	1,169,675	3,825
	Total		**11,725,514**	**39,165**
Sea Beach Line	86th Street	N	453,685	1,453
	Avenue U	N	607,283	1,971
	Kings Highway	N	889,762	2,878
	Bay Parkway	N	1,156,255	3,765
	20th Avenue	N	910,483	3,058
	18th Avenue	N	1,025,145	3,254
	Fort Hamilton Parkway	N	1,146,251	3,824
	Total		**6,188,864**	**20,203**
Brighton Line	Ocean Parkway	D	877,795	2,728
	Brighton Beach	D, Q	3,323,896	10,504
	Sheepshead Bay	D, Q	3,757,722	12,779
	Neck Road	D	1,064,966	3,513
	Avenue U	D	2,188,249	6,927
	Kings Highway	D, Q	4,891,156	16,457
	Avenue M	D	1,599,228	5,441
	Avenue J	D	1,791,034	5,813
	Avenue H	D	778,430	2,497
	Newkirk Avenue	D, Q	2,778,820	8,945
	Cortelyou Rd	D	1,720,662	5,460
	Beverley Rd	D	866,816	2,768
	Church Avenue	D, Q	4,930,357	15,634
	Total		**30,569,131**	**99,466**
Culver Line	Neptune Avenue	F	504,119	1,713
	Avenue X	F	892,584	2,985
	Avenue U	F	677,118	2,225
	Kings Highway	F	1,062,204	3,421
	Avenue P	F	893,706	2,924
	Avenue N	F	980,643	3,301
	Bay Parkway	F	363,739	1,200
	Avenue I	F	755,743	2,535
	18th Avenue	F	1,158,753	3,735
	Ditmas Avenue	F	1,383,950	4,502
	Church Avenue	F	2,718,439	8,620
	Total		**11,390,998**	**37,161**
Nostrand Avenue Line	Brooklyn College-Flatbush Avenue	2, 5	5,499,297	18,816
	Newkirk Avenue	2, 5	2,395,907	7,946
	Beverly Road	2, 5	1,231,687	4,063
	Church Avenue	2, 5	2,999,614	9,795
	Total		**12,126,505**	**40,620**
Canarsie Line	Rockaway Parkway – Canarsie	L	2,873,821	9,567
	E. 105th Street	L	774,380	2,576
	Total		**3,648,201**	**12,143**
Transfer Points	New Utrecht Avenue/62nd Street	B, M, N	1,223,846	3,879
	Stillwell Avenue – Coney Island	B, D, F, N	3,527,852	10,056
	W. 8th Street – New York Aquarium	D, F	766,410	2,207
	Total		**5,518,108**	**15,142**

Source: MTA NYCT –2000 Subway and Bus Ridership Report

The 54 subway stations located within the study area are located on elevated structures, in tunnels, on the surface, or in open cuts. These stations are listed by line on Table II-2 and shown in Figure II-2, Subway Stations. Stations that serve multiple lines (transfer points) are listed in a separate section. The Fourth Avenue Line has four stations in the project area. The West End Line has ten stations, plus a shared station at Stillwell Avenue, and 62nd Street. The Sea Beach Line has seven stations, in addition to a station shared with the West End Line at New Utrecht Avenue and the Stillwell Avenue Terminal. The Brighton Line has 13 stations in the study area, and an additional two stations that are shared with other lines. Five Brighton Line stations are served by both express and local trains, and 10 are served by local trains only. The Culver Line has 11 local stations, as well as two stations that it shares with other lines on Coney Island. The Nostrand Avenue Line has only four stations in the project area. Similarly, only two stations on the eastern end of the Canarsie Line are within the study area.

e. System Ridership

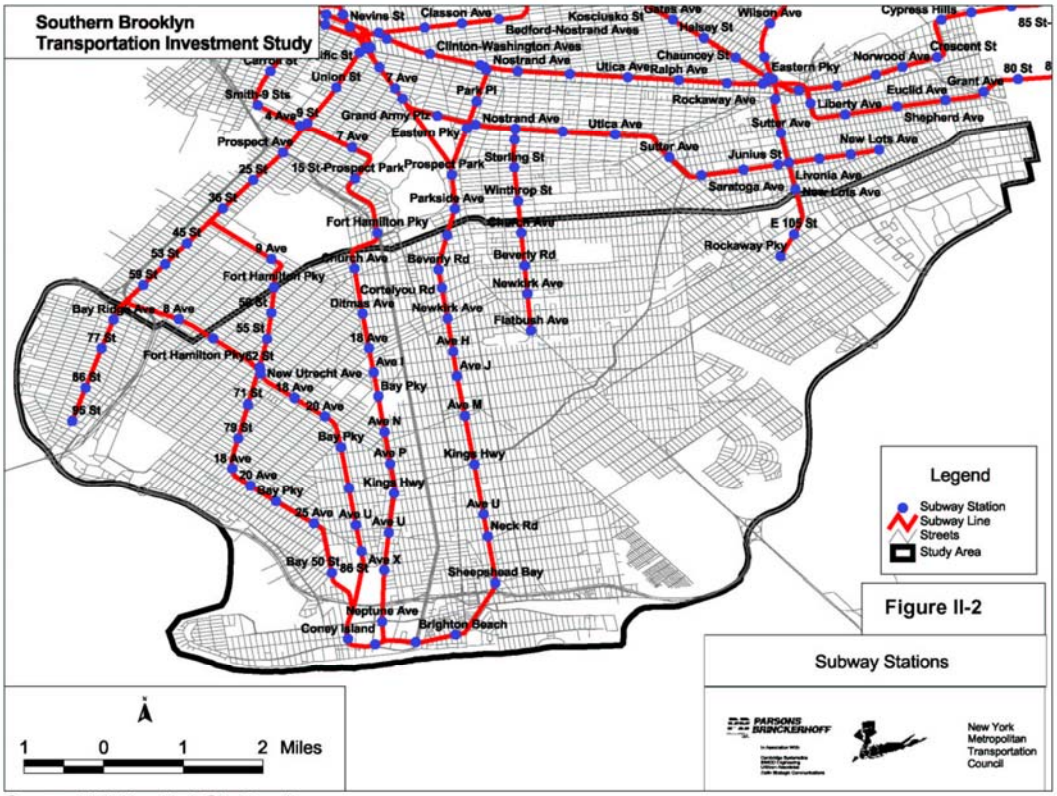
Table II-2 also includes year 2000 annual and average weekday ridership data. This data shows that the subway stations within the study area along the Brighton Line combine to serve a total of 30,569,131 passengers per year, easily the highest total among all of these subway line segments. This line also serves 99,466 average weekday passengers. With 12,126,505 total annual passengers within the study area, the Nostrand Avenue Line averages 40,620 weekday passengers, which is the second-highest total in the study area. The line within the study area with the lowest passenger counts is the Canarsie Line, which served 3,648,201 total passengers in 2000 and averaged 12,143 passengers per weekday. It should be noted that only two stations on this line are located in the study area, which accounts for the relatively low totals on this line segment. Passenger activity counts for time periods during weekday, Saturday, and Sunday service are presented in Appendix B.

The station with the highest passenger total in 2000 was the Brooklyn College-Flatbush Avenue Station (5,499,297), which is the last stop on the Nostrand Avenue Line. Many of the stations along the Brighton Line experience very high ridership, especially stops served by both the Brighton Local (D) and Express (Q). Bay Parkway on the Culver Line (F) has the lowest ridership of any station within the study area; this station averaged 1,200 boardings during weekday service, and generated a total of 363,739 boardings in 2000.

f. Existing and Future Constraints

A number of subway related changes that are planned or already underway that will impact Southern Brooklyn, in most cases by placing constraints on service and dictating alternate service patterns. The projects detailed in this section include construction of the Manhattan Bridge, temporary service changes due to the September 11th tragedy, and reconstruction of the Stillwell Avenue Terminal in Coney Island. Besides these major construction projects, ongoing routine maintenance projects such as station, track, power system, and line structure rehabilitations will continue to impact all subway services on a regular basis. It should also be noted that MTA-NYCT monitors the service needs on all subway lines in the city.

FIGURE II-2
SUBWAY STATIONS



Source: MTA New York City Transit

Ongoing construction on the Manhattan Bridge will continue to have an impact on subway service in Southern Brooklyn, specifically by placing a limit on the available track capacity on that structure. Construction on the Manhattan Bridge began in 1992, after responsibility for all four East River Bridges was transferred from New York State to New York City. For years, this construction impacted the two subway tracks on the south side of the bridge, compelling trains crossing the bridge to use the north side tracks and establishing a service pattern followed by the B, D, and Q trains. In July 2001, the City Department of Transportation completed work on the south side of the bridge and initiated reconstruction of the north spans, necessitating that subway trains now travel on the southernmost tracks. Because of the configuration of the tracks on the Manhattan side of the bridge, trains crossing the bridge now have access to the express tracks on the Broadway Line in Manhattan instead of the Sixth Avenue Line. With this new condition, NYCT initiated service changes including the termination of B and D trains at 34th Street, the replacement of B service with Q local and express service in Brooklyn on the Brighton Line, and the introduction of the W to replace D service on the Fourth Avenue and West End lines. In order to mitigate the impact of the discontinuation of B and D service to the Grand Street station in Manhattan, a subway shuttle between that station and West 4th Street was implemented. The current construction phase is due to be completed in 2004. At that time, capacity will increase from two to four subway tracks on the bridge, with access to both the Broadway and Sixth Avenue Lines. This will create opportunities for service enhancements that may positively affect subway service in Southern Brooklyn. New York City Transit has recently initiated an investigation of potential post-construction service patterns, which will include a public involvement component.

The tragic events of September 11, 2001, apart from affecting ridership patterns due to the loss and displacement of thousands of jobs in lower Manhattan and decrease in automobile accessibility to that area, had a temporary effect on the subway network. Three stations on the Seventh Avenue Line in Manhattan that were served by the 1 and 9 trains were closed. MTA-NYCT responded by running No. 1 trains into Brooklyn, where they replaced the No. 3 trains on the New Lots Avenue Line. MTA-NYCT rapidly rebuilt the affected part of this line, and restored previous service patterns on the Nos. 1/9, 2, and 3 trains in the Fall of 2002, although the Cortland Street station remains closed. In the longer term, there has been discussion as part of the World Trade Center redevelopment of creating an underground passageway that would link a new PATH station with the Seventh Avenue and Broadway Lines.

The Stillwell Avenue terminal in Coney Island is undergoing a major rehabilitation. Work on this station started in November 2001 and is expected to continue until January 2005. The rehabilitation will include a complete reconstruction of track and platform areas, a new station entrance and mezzanine, restoration of retail/headhouse in accordance with state and local preservation guidelines, improved lighting, bus loading/waiting areas, off-hour waiting areas, new public restrooms, a new NYPD precinct within the terminal, and improvements to make all trains ADA accessible. The rehabilitation work will occur in phases. Phase I started in November 2001 and concluded in September 2002. During this phase all train lines with the exception of the Sea Beach Line (N) operated into Stillwell Avenue. Sea Beach Line trains terminated service at 86th Street, which is one station north of Stillwell Avenue. Phase II is

scheduled from September 2002 to May 2004, where only the West End Line (B/W) trains will have access to the station. Sea Beach Line (N) trains will continue to operate to 86th Street, while all Brighton Line (Q) trains will terminate at Brighton Beach. Culver Line (F) trains will operate to Avenue X, which is three stations north of Stillwell Avenue. During this phase, the West 8th Street/NY Aquarium, Neptune Avenue, and Ocean Parkway stations will be without subway service; however, shuttle buses will operate to these stations. The final phase is scheduled to begin in May 2004 and end in January 2005, and will see the same service pattern as Phase I.

2. Buses

a. Background and System Characteristics

A total of 47 bus routes presently serve the Southern Brooklyn study area, providing direct connections to various neighborhoods within the borough as well as to Manhattan, Queens and Staten Island. Thirty-four of these routes operate local service, four routes offer both local and limited stop service, two operate solely on a limited stop schedule and eight provide express service. Local bus routes serve all bus stops along a route, which are usually located every two blocks. Limited stop routes only stop at important generators or cross streets along the route, thus providing a quicker trip. Express services in Southern Brooklyn operate between neighborhoods in Brooklyn and Manhattan, making stops only within the neighborhoods, then operating non-stop to Manhattan, providing very direct service.

47 BUS ROUTES SERVE THE STUDY AREA

FIGURE II-3
EXISTING BUS NETWORK

Three separate operators are responsible for service on these routes. The first of these, NYCT, maintains a fleet of 4,871 buses and is the largest transit bus agency in the United States. NYCT provides the majority of bus service in New York City, and operates routes in all five of the city's boroughs. In addition to NYCT, the New York City Department of Transportation (NYCDOT) contracts bus service out to several private bus operators. NYCDOT's system is supported by a fleet of over 1,280 buses, making it the ninth largest transit bus fleet in the United States and Canada. Command Bus Company is one of these transit providers, operating the B100 Kings Highway Station/Mill Basin Route and the B103 Downtown Brooklyn/Canarsie Route, as well as five express bus routes in the study area, the BM1, BM2, BM3, BM4, and BQM1. Command was created in 1979 to assume service that had previously been provided by Pioneer Bus Corporation, until that company was shut down because of a strike. The other private operator serving Southern Brooklyn, Green Bus Lines, originated in 1925 and currently operates local and express routes that primarily serve Queens and Manhattan. Within the Southern Brooklyn study area, Green Bus operates the Q35 Midwood/Rockaway Park Route, which is a Queens-based route that traverses the Gil Hodges Bridge to connect the Brooklyn College area in Midwood with the Rockaway Park area in Queens. A map of bus routes in the Southern Brooklyn area is provided on Figure II-3, Existing Bus Network.

3. Bus Depots

There are six bus depots within Brooklyn; five are owned by New York City Transit and one is owned by New York City Department of Transportation (NYCDOT). The depot owned by NYCDOT is utilized by Command Bus Company for the services operated by that company under contract with NYCDOT. All of the NYCT Brooklyn bus depots service bus routes that operate in Southern Brooklyn. New York City Transit bus depots are presented on Table II-3.

TABLE II-3
NEW YORK CITY TRANSIT BUS DEPOTS

Depot Name	Study Area Routes Served
East New York	B7, B8, B12, B14, B15, B17, B20, B25, B40, B42, B45, B60, B82, B83, Q24, Q56
Flatbush	B2, B6, B31, B39, B41, B44, B46, B49, B78
Fresh Pond	B13, B18, B20, B24, B26, B38, B48, B52, B54, B57, Q54, Q55, Q58, Q59
Gleason	B9, B11, B16, B23, B35, B37, B43, B51, B61, B63, B65, B67, B68, B69, B70, B71, B75, B77, Manhattan Bridge Shuttle
Ulmer Park	B1, B3, B4, B6, B36, B64, B74, X27, X28, X29

Source: MTA-NYCT

a. Summary of Route Statistics

This section provides a summary of important statistics of the Southern Brooklyn bus routes. Statistics collected indicate that for the most significant of these measures, which include total miles, total hours and total passengers, NYCT Route B41 in the Flatbush Avenue corridor, Route B44 in the Nostrand Avenue corridor, and Route B46 in the Utica Avenue corridor tend to generate the highest totals. The B44 Route generates the

highest number of total miles (1,604,553). This is followed by Route B46 (1,490,498 miles) and Route B41 (1,451,291 miles). Route B41 generates 232,836 total hours per year, which is the highest of all routes in the study area. Route B41 is followed in total hours operated by Route B44 (220,956 hours) and Route B46 (218,846 hours). Route B46 produces the second-highest annual ridership (13,396,171 passengers), behind only Route B44, which carries 13,426,755 passengers. These routes have the third and fourth highest ridership in the city. Similar to Routes B44 and B41, the B46 travels north-south while serving between Kings Plaza and Williamsburg. Route B41 is the third highest in terms of ridership (fifth highest in the city), carrying 12,945,534 passengers. These three routes also rank among the slowest of all of the bus routes that serve in the study area, an attribute that may partially be attributed to their high ridership and the congestion in their corridors of operation. Other routes in the study area that have ridership totals that rank in the top ten of all routes in the city are the B35 with 11,649,465 passengers in 2000 (7) and the B6 with 11,201,511 (10). The B103 Canarsie Limited averages 513 passengers per day and 130,824 passengers per year, making it the route with lowest ridership.

Productivity measures that can be used to evaluate bus routes in Southern Brooklyn include passengers per vehicle hour and passengers per vehicle mile. Passengers per vehicle hour is a measure of the number of passengers carried for each hour of vehicle operations. The average passengers per vehicle hour for routes in Southern Brooklyn is 46.3 passengers per hour. The routes with the highest passengers per vehicle hour are the B74 with 73.6 passengers per hour, the B35 with 69.8 passengers per hour, and the B36 with 63.8 passengers per hour. The routes with the lowest number of passengers per vehicle hour tend to be express routes. Direct comparisons between local/limited and express routes should be avoided due to the different operating characteristics of these route types. Among local/limited routes, lower performance is evident in routes such as the B23 (27.3 passengers per hour), the B37 (28.6 passengers per hour), and the B103 (10.1 passengers per hour).

Another productivity measure is passengers per vehicle mile, which is the annual average of ridership per mile of vehicles in operation. The average productivity is 5.7 passengers per vehicle mile. The best performing routes are the B35 with 11.5 passengers per mile, the B74 with 9.8 passengers per mile, and the B46 with 9.0 passengers per mile. Local/limited routes that are poorer performers in this category include the B31 and B37 (3.9 passengers per mile each), the B103 (1.1 passengers per mile), and the S79 (2.7 passengers per mile).

Regardless of factors such as the routes' physical characteristics, ridership, and type of service operated (i.e. local, limited stop or express service), most buses in Southern Brooklyn operate fairly slowly. The average weekday speed of all buses serving the study area is 8.0 miles per hour. The routes that have the highest average speed are the Q35 at 13.8 miles per hour, and the X27 and X28 at 12.9 miles per hour. Two of these routes are express routes that have few stops and operate on highways. The other route, the Q35, has segments that operate through the Gateway National Recreation Area where there are very few stops. The slowest routes in the study area are the B35 at 6.1 miles per hour, and the B41 and B63 at 6.2 miles per hour. These routes operate at such low speeds due to the high traffic volumes along the corridors in which they operate, and the

high volumes of passengers that use the routes. Statistics for all Southern Brooklyn bus routes are presented in Table II-4.

TABLE II-4
STUDY AREA BUS ROUTE INVENTORY

Bus Route	Service Type	Annual Ridership	Annual Vehicle Hours	Annual Vehicle Miles	Peak Vehicle Requirements
B1	Local	5,815,198	112,164	917,599	27
B2	Local	1,096,429	24,604	173,957	7
B3	Local	4,663,552	79,922	590,933	20
B4	Local	2,030,438	56,052	494,108	12
B6	Local/Limited	11,201,511	183,094	1,400,244	42
B7	Local	2,378,970	58,582	434,593	17
B8	Local	6,466,103	133,818	994,041	32
B9	Local	3,754,059	90,125	744,787	22
B11	Local	3,379,654	76,724	487,229	18
B13	Local	1,103,375	33,496	253,266	9
B15	Local	6,828,394	141,938*	1,240,809*	25*
B16	Local	2,226,612	68,433	540,881	19
B17	Local	4,413,366	77,617	617,157	21
B20	Local	2,223,702	53,218	386,786	21
B23	Local	530,704	19,465	130,552	4
B31	Local	785,862	24,149	201,228	6
B35	Local	11,649,465	166,867	1,011,643	40
B36	Local	4,732,844	74,198	607,669	23
B37	Local	1,363,744	47,654	351,081	11
B41	Local/Limited	12,945,534	232,836	1,451,291	58
B42	Local	1,549,694	31,128	228,855	10
B44	Local/Limited	13,426,755	220,959	1,604,553	56
B46	Local/Limited	13,396,171	218,846	1,490,498	53
B49	Local	6,312,011	142,689	1,112,740	40
B60	Local	5,137,485	107,903*	770,926*	26*
B63	Local	4,710,340	110,446	681,326	24
B64	Local	1,862,515	40,957	334,030	8
B67	Local	1,560,655	44,438*	306,642*	12*
B68	Local	5,302,150	98,972	817,316	21
B70	Local	891,761	23,699	175,246	5
B74	Local	1,150,666	15,636	117,361	4
B78	Local	1,910,303	40,483	290,908	11
B82	Local	8,335,691	149,044	1,248,252	34
B83	Local	2,796,805	48,047	325,131	12
B100	Local	963,845	30,377	284,096	12
B103	Limited	130,824	12,966	122,919	8
Q35	Local	1,438,852	33,802	467,053	7
S53	Local	2,162,866	48,565*	510,667*	12*
S79	Local	2,177,424	66,384*	801,908*	14*
X27	Express	1,000,316	78,030	1,003,680	34
X28	Express	981,765	78,540	1,015,155	39
X29	Express	151,287	17,595	211,905	12
BM1	Express	608,883	64,777	795,497	25
BM2	Express	513,854	58,155	654,599	24
BM3	Express	475,278	58,486	720,593	24
BM4	Express	267,955	32,925	392,634	14
BQM1	Express	166,763	19,096	235,711	12

Source: MTA-NYCT 2000 Route Profiles
** 1999 Data*
Note: Annual Ridership = Annual Unlinked Passenger Trips

Individual route profiles are detailed in Appendix C.

b. Future Projects and Development

A number of projects will affect bus service in Southern Brooklyn. One major planned infrastructure project that will impact bus service in Southern Brooklyn is the construction of a new bus depot in Maspeth. This new depot will allow an increase in the number of buses available for service in Brooklyn and Queens, which would include services in the Southern Brooklyn area.

NYCT frequently monitors service on all bus routes, and when necessary, adjusts service to cope with changes in demand. In June 2002, the MTA board approved two proposals to combine routes that will impact bus service in Southern Brooklyn. The first proposal called for combining the B13 and B18 routes into one route. This will provide a single seat trip for passengers between the eastern end of the study area and Williamsburg. The other proposal called for combining the B40 and B78 routes into one route called the B47. This route will provide one single service on Ralph Avenue, operating up to Williamsburg. Another recent change to the B13 has been a short extension from its previous southern terminus on Fountain Avenue to serve the new Gateway Center Mall via a loop encompassing Gateway Drive, Erskine Street, and Vandalia Avenue.

4. Ferries

a. Background and System Characteristics

Prior to September 11, 2001, no regular commuter ferry service was in operation in the study area. In order to meet the additional demand for transit that resulted from the events of September 11, NYCDOT introduced ferry service from the Brooklyn Army Terminal (BAT) located at 58th Street and 1st Avenue in Brooklyn to the Whitehall Ferry Terminal in lower Manhattan. The Federal Emergency Management Agency (FEMA) is subsidizing this service through the end of 2002; therefore, NYCDOT is providing this ferry service at no charge to the public until then. Ferry service was initially provided using the backup Austin Class ferryboats of the Staten Island Ferry. On June 26, 2002 NY Waterway took over the service under contract to the city, keeping the same schedule but utilizing smaller vessels. As the FEMA subsidy expired, NY Waterway discontinued service in May 2003, at which time another private ferry operator, New York Water Taxi, initiated service. In Brooklyn, connecting service is provided by NYCT Route B11.

FERRY OPERATORS CONTINUE TO EVALUATE OPPORTUNITIES FOR ADDITIONAL SERVICE

b. Service Span & Frequency

Ferries operate Monday through Friday, from 6:00 AM to 10:00 AM during morning service, with ferries departing the BAT every 30 minutes. 30 minute headways also apply to afternoon and evening service, which operates from 3:30 PM to 7:30 PM. The ferry travels approximately 5 miles each way, and the trip duration is roughly 22 minutes. No vehicles are allowed on the ferries.

Using a contracted bus operator, NYCDOT had provided free shuttle service to the public as a means of transporting ferry passengers to the BAT. This shuttle circulated through the Southern Brooklyn neighborhood of Bay Ridge, originating on 4th Avenue and serving along Shore Road to the BAT. The shuttle's route length was approximately 3.4 miles each way; during afternoon service, local and express shuttle buses were available. Shuttle buses operated from 5:30 to 10:00 in the morning, and between 3:30 and 8:00 during afternoon and evening service. NYCDOT ceased providing the shuttle bus service in May 2002 due to lack of funds. Since taking over the ferry service, however, NY Waterway has resumed the previous shuttle bus service.

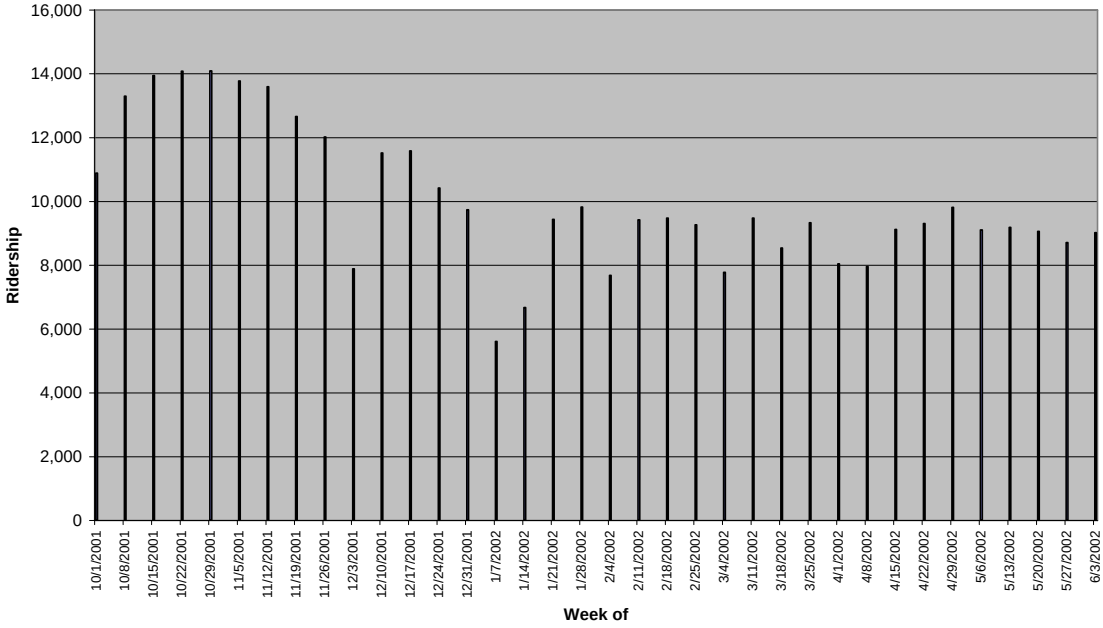
c. System Ridership

Ridership totals throughout this initial service period indicate that ridership peaked during October and November, shortly after the ferry service was implemented. Ridership tapered off slightly through the end of 2001, and has consistently totaled between 8,000 and 10,000 passengers per week since the beginning of 2002. This is shown on Figure II-4, Total Brooklyn-Manhattan Weekly Ferry Ridership. Time of day ridership is presented on Figure II-5 (Brooklyn-Manhattan Ferry Ridership By Time, AM) for AM trips and Figure II-6 (Brooklyn-Manhattan Ferry Ridership By Time, PM) for PM trips. This total is the average ridership for all days that service has operated from November to May. These figures show that ridership increases as the morning progresses, peaks at 8:00 AM, and then declines. A similar pattern is observable in the afternoon, with a ridership peak at 5:30 PM.

d. Future Projects and Development

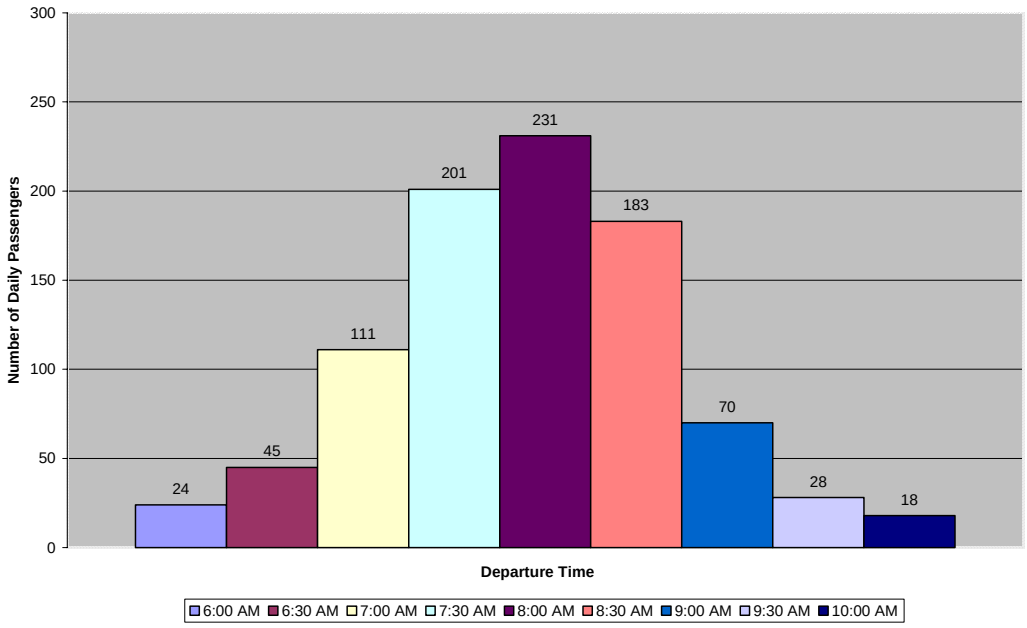
The New York City Department of Transportation and New York Waterway will continue to evaluate service between the Brooklyn Army Terminal and Pier 11 to determine if it should continue once FEMA funding is discontinued. Although no specific service has been identified, ferry operators continue to evaluate locations in Brooklyn for the feasibility for implementing future service.

FIGURE II-4
TOTAL BROOKLYN-MANHATTAN WEEKLY FERRY RIDERSHIP



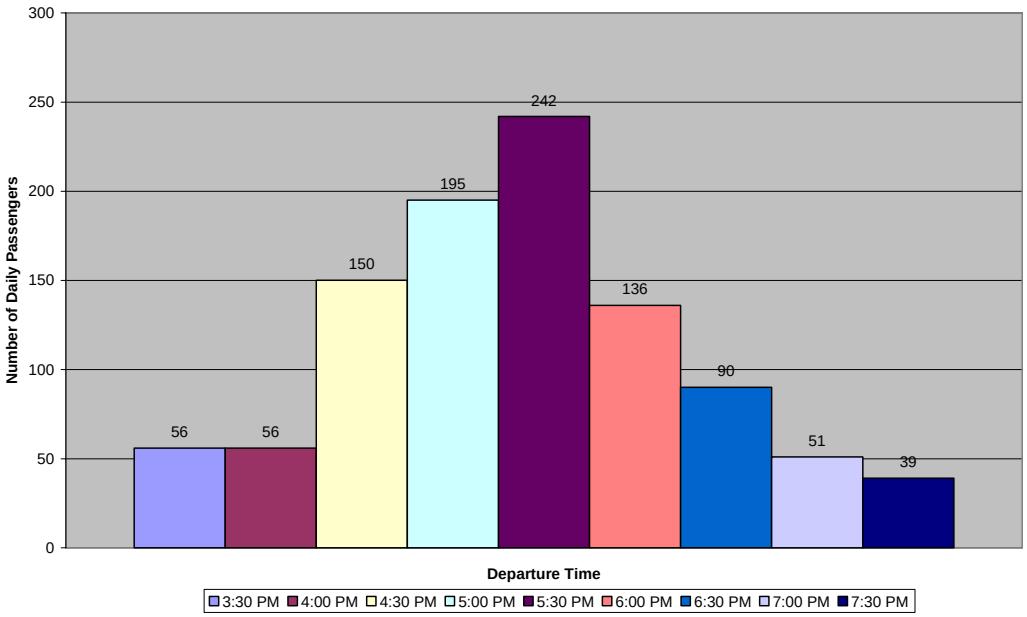
Source: New York City Department of Transportation

FIGURE II-5
BROOKLYN-MANHATTAN FERRY RIDERSHIP BY TIME, AM



Source: New York City Department of Transportation

FIGURE II-6
BROOKLYN-MANHATTAN FERRY RIDERSHIP BY TIME, PM



Source: New York City Department of Transportation

5. Commuter and Jitney Vans

a. Background

The New York City Taxi and Limousine Commission defines a commuter van as "a motor vehicle with a seating capacity of nine to twenty passengers, providing transportation on a pre-arranged daily basis along non-specified or irregular routes between a residential zone and work related location, a mass transit facility, a shopping center or recreational facility."[1] Commuter van services, or 'authorities', must register with the New York City Taxi and Limousine Commission to operate, and are required to license each vehicle in its active fleet with the Commission. A total of 14 van authorities are located throughout the Southern Brooklyn study area. These authorities, along with two additional authorities located just outside of the study area border, are listed in Table II-5 with their location and number of active vehicles. The table identifies Brooklyn Van Lines, which maintains a total of 36 active vehicles in its fleet, as having the highest number of vehicles. Tim Service (11 vehicles) and Krystale Van Lines Corporation (9 vehicles) are the next largest van authorities in the study area after Brooklyn Van Lines.

TABLE II-5
STUDY AREA VAN AUTHORITY INVENTORY

Authority Name	Address	City	Total Vehicles
BB Trans	2422 E. 70th St.	Brooklyn	3
Blackstreet Van Lines, Inc.*	310 Lenox Road Apt. 4H	Brooklyn	3
Brooklyn Van Lines, Inc.	1498 Flatbush Avenue 3 FL	Brooklyn	36
Bruckhand Transportation	1081 Schenectady Avenue	Brooklyn	0
David's Car/Limo Service, Inc.	1381 East 101 Street	Brooklyn	1
Dollavan Legal Transportation	1722 Flatbush Avenue	Brooklyn	5
G.Y. Services, Inc.	8818 16 Avenue	Brooklyn	0
Integrity Care, Inc.	1149 East 102 Street	Brooklyn	0
Kismet Travel Inc.	247 East 56 Street	Brooklyn	1
Krystale Van Lines Corporation	1520 Flatbush Avenue Suite 8	Brooklyn	9
Main Street Transportation Service	1464 East 95 Street	Brooklyn	0
New York City Express Van Service	1725 Dorchester Road 3B	Brooklyn	3
Safe and Sound Transport, Inc.	2055 East 28 Street	Brooklyn	2
Shing Hing Inc.*	923 58 Street	Brooklyn	3
Tim Service Inc.	8818 16 Avenue	Brooklyn	11
Today Service, Inc.	8818 16 Avenue	Brooklyn	0

Source: New York City Taxi and Limousine Commission

* *Located just outside of study area.*

While there are quite a number of legal van operators servicing Southern Brooklyn, there are numerous other illegal commuter and jitney activities occurring. These include both illegal van operators conducting jitney services, as well as legal providers operating in an illegal manner. While legal van operators are restricted by New York City law to only picking up passengers on a pre-arranged basis, most also pick up street hails on busy transit corridors. Also, there are many privately owned vans, which are not licensed to

[1] Commuter Van Service Policy Study, NYCDOT, October 1998.

provide any sort of passenger transportation services, operating in Southern Brooklyn. By estimates from studies reviewed by the consultant team, the number of unlicensed vans represents approximately 80 percent of all commuter and jitney services. These illegal operators are a serious issue due to passenger safety, blocking of traffic on busy thoroughfares when picking up and dropping off passengers, and blocking of bus stops when transit buses need to access.

Commuter and jitney vans in the Southern Brooklyn area are used for a variety of different reasons. These include convenience, comfort, cost, frequency, loyalty, habit, service, and speed. Commuter and jitney vans are convenient because they provide door-to-door service. They can be more comfortable than buses since passengers never have to stand, and they provide more comfortable seats. Since most of the van services only cost one dollar, they provide a low cost alternative to the bus for trips that don't require a transfer, or for those users who do not have a MetroCard. Since these vans have very limited capacity (in most instances only 14 passengers), they operate very frequently to meet demand. Many passengers, as well as drivers, of jitney vans tend to be recent immigrants, who may have used jitneys in their country of origin, so out of habit and to support entrepreneurial drivers from their community, they tend to patronize these van services. Patrons also use commuter vans since they are able to provide more direct service between an origin and destination, thus bypassing the need to wait and transfer between multiple routes. Since commuter and jitney vans are smaller vehicles, they are faster and more maneuverable. This plus the added bonus that once a van is full, they will proceed without stopping until a passenger needs to exit the vehicle, providing for very speedy service. This makes both legal and illegal vans a very attractive transportation option.

b. Street Observations

On Thursday, June 27, 2002 and Tuesday, July 2, 2002, members of the TIS Study Team conducted on-sight observations of jitney and commuter van operations. The observation locations were identified through input received at the local area visioning meetings and were reviewed and approved by the Taxi and Limousine Commission. The locations were at Kings Plaza, 8th Avenue at 59th Street, Nostrand Avenue at Flatbush Avenue, the Canarsie/Rockaway Parkway subway station, and Church Avenue at Nostrand Avenue. In all five locations, a total of 296 individual vans were observed with 188, or 64 percent of them being illegal. Most vehicles were 14 passenger vans, however there were quite a number of minivans, and at one location, mostly livery cars were observed. Vehicles were determined to be jitney vans if they appeared to be cruising for passengers, or passengers were observed boarding and alighting. Legality was determined by the license plate on the vehicle. Legal vans have Taxi and Limousine Commission plates, while illegal ones have regular New York license plates or out of state plates. The average load of the vans was approximately 3 passengers; however, there were quite a few completely full vans observed, as well as empty ones. The following section details the individual locations that were observed. Team members also observed and noted the impact these vans have on general traffic and bus operations.

(1) Kings Plaza

At Kings Plaza, vans were observed at the intersection of Avenue U and Flatbush Avenue. The observation occurred during the PM peak period. On Avenue U, the vans tend to block the far right lane when picking up and dropping off passengers. Vans were also observed blocking the bus stop on northbound Flatbush Avenue near Avenue U; however, the high volume of buses at this bus stop makes jitney activity difficult. Table II-6 provides an overview of jitney activity at this location.

TABLE II-6
KINGS PLAZA JITNEY ACTIVITY

Category	Observation
Number of Observations	75
Illegal Vehicles	53
Percent Illegal	70.7 percent
Minivans	12
Total On	197
Average On	2.63
Total Off	56
Average Off	0.75
Average Load	5.24

(2) 8th Avenue at 59th Street

In Sunset Park, van activity was observed at the intersection of 8th Avenue and 59th Street during the PM peak period. The jitney vans stopped at multiple locations, regardless of whether or not they were blocking traffic. While cruising for passengers, vans frequently slowed down in this vicinity, forcing other drivers to respond, causing traffic backups. Table II-7 gives an overview of jitney activity at this location.

TABLE II-7
8TH AVENUE AT 59TH STREET JITNEY ACTIVITY

Category	Observation
Number of Observations	51
Illegal Vehicles	36
Percent Illegal	70.6 percent
Minivans	16
Total On	16
Average On	0.31
Total Off	9
Average Off	0.18
Average Load	3.74

(3) Canarsie/Rockaway Parkway Subway Station

The Canarsie observation took place in front of the Rockaway Parkway Subway Station, which is the terminal stop for the L-Canarsie Line. This observation occurred during the AM peak period. At this location, very few vans were observed, but livery cab activity was significant. Due to congestion in the area, many cabs and vans dropped off

passengers a short distance from the subway station, near the intersection of Rockaway Parkway and Glenwood Avenue. When vehicles stopped in front of the subway station, they occasionally caused traffic to spillback into the surrounding intersections. Table II-8 gives an overview of van and livery cab activity at this location.

TABLE II-8
CANARSIE/ROCKAWAY SUBWAY STATION PARKWAY JITNEY ACTIVITY

Category	Observation
Number of Observations	20
Illegal Vehicles	10
Percent Illegal	50.0 percent
Minivans	4
Total On	13
Average On	0
Total Off	0
Average Off	26
Average Load	1.3

(4) Church Avenue and Nostrand Avenue

Jitney observations at this location occurred during the PM peak period. Only van observations were recorded at this location; however, there were numerous livery cabs operating in the same manner as the jitney vans. The livery cabs were observed to stop at the same locations as the jitney vans and wait for numerous passengers, often times filling all seats before leaving the intersection. At this intersection most of the activity occurred along Church Avenue, with a few vans operating on Nostrand. Vans picked up passengers at any location at the intersection, often times picking up passengers at bus stops. Table II-9 presents jitney van activity at this intersection.

TABLE II-9
CHURCH AVENUE AND NOSTRAND AVENUE JITNEY ACTIVITY

Category	Observation
Number of Observations	75
Illegal Vehicles	48
Percent Illegal	64.0 percent
Minivans	49
Total On	30
Average On	0.40
Total Off	8
Average Off	0.11
Average Load	2.70

(5) Flatbush Avenue and Nostrand Avenue

Jitney observations at this intersection occurred during the AM peak period. Only vans that stopped at the intersection were recorded. Van activity along Flatbush Avenue was very heavy, while van service along Nostrand Avenue was very infrequent. In the northbound direction along Flatbush Avenue, vans picked up and dropped off in an area

designated for taxi standing. In all other locations at this intersection, vans were picking up and dropping off in bus stop areas. On Nostrand Avenue, livery cabs double parked next to the entrance to the Flatbush Avenue Subway Station. Table II-10 provides details on van activity at this intersection.

TABLE II-10
FLATBUSH AVENUE AND NOSTRAND AVENUE JITNEY ACTIVITY

Category	Observation
Number of Observations	75
Illegal Vehicles	41
Percent Illegal	54.7 percent
Minivans	1
Total On	43
Average On	0.57
Total Off	31
Average Off	0.41
Average Load	2.68

6. Park and Rides

Within the five boroughs, there are 38 park and ride sites that have been designated by NYCDOT as places where commuters can drive to and access transit, as well as 13 municipal parking lots that are not official park and rides, but do offer transit access. In the year 2000, NYCDOT initiated a study that inventoried existing park and rides with a view to making recommendations "to promote and establish a more effective network of park and ride facilities in New York City." A major initial finding was that park and rides are generally underutilized for a variety of reasons, including lack of awareness and negative perceptions of safety and security. This chapter presents the information collected in that study for the Southern Brooklyn.

Table II-11 provides an overview of the seven park and rides within the study area. Also included is a park and ride just outside the study area in Brighton Beach. As is the case in much of the rest of the city, five of the park and rides had observed utilization rates of 50 percent or less. Sites with utilization rates greater than 50 percent were Flatbush/Caton Parking Field (60 percent) at the northern edge of the study, Sheepshead Bay No. 2 Parking Field (75 percent), and Bay Ridge Parking Garage (95 percent). The high level of occupancy at the latter location can be partly attributed to the fact that the 86th street shopping district is a destination in itself. Thus, many of those that park there are not doing so to continue their trip on transit. Conditions tended to be good or excellent in these park and rides, and safety and security was not identified as a major perceived issue at any of the lots. Transit access was generally excellent, as all of the sites were within easy walking distance of a subway stop and, in some cases, an express bus stop. All of the lots charged something for parking. Daily rates ranged from $1.75 to $9.85, with the highest rate at the site that also had the greatest demand (Bay Ridge). Several park and rides also had permit parking. Overall, these charges are reasonable, especially when compared with Manhattan parking rates.

TABLE II-11
STUDY AREA PARK & RIDES

Site	Location	Capacity	Observed Utilization	Overall Condition	Transit Access	Daily Rate
Avenue M Parking Field	East 17th St/ Chestnut Ave	61	25 percent	Excellent	Avenue M station on Brighton Line, BM3, X29	$2.50
Flatbush/Caton Parking Field	Flatbush Ave/ Caton Ave	57	60 percent	Good	Parkside Avenue Station on Brighton Line	$2.25
Sheepshead Bay #2 Parking Field	East 16th St/ Voorhies Ave	79	75 percent	Good	Sheepshead Bay Station on Brighton Line, BM3	$3.00
Bay Ridge Parking Garage	5th Ave/ 85th St	205	95 percent	Good	86th Street Station on 4th Avenue Line	$9.85
Bensonhurst #1 Parking Field	86th St/18th Ave	97	40 percent	Excellent	18th Avenue Station on West End Line	$1.75
Brighton Beach Parking Field	Brightwater Court/ Brighton 3rd Street	271	40 percent	Fair	Brighton Beach Station on Brighton Line	NA
Canarsie Parking Field	Rockaway Pkwy/ Farragut Rd	259	50 percent	Good	Canarsie/Rockaway Parkway Station on Canarsie Line	$2.25
Flatbush/Nostrand #2 Field	Ave H between Nostrand Ave and Flatbush Ave	138	20 percent	Good	Brooklyn College/Flatbush Avenue Station on Nostrand Avenue Line, BM1, BM2, BM2S	$3.00

Source: New York City Commuter Park and Ride Program, Draft Technical Memorandum #1

In summary, park and rides in the study area represent existing transit resources that have the potential for greater utilization.

7. Preliminary Issues

A number of preliminary general issues have emerged related to public transportation. These became apparent as a result of the literature review, on-site observations, public outreach and various agency correspondences and data sources. Defining general areas of concern or opportunity will help focus and guide subsequent phases of the TIS, alongside the input received from the public through the community involvement program.

Some of the preliminary issues presented below relate to a specific mode, while others affect the entire transportation network or access to specific generators.

a. Lack of Rapid Transit Service Along Major Corridors in Southern Brooklyn

Several major corridors in Southern Brooklyn have no rapid transit service on all or part of their length, as can be seen in Figure II-7, Average Subway Daily Ridership. The bus routes along these corridors have very heavy utilitzation (in many cases, ridership is greater than what is experienced on Light Rail lines in other cities). These high ridership corridors include Nostrand Avenue, Utica Avenue, Flatbush Avenue, Church Avenue, Bay Parkway, Flatlands Avenue, Linden Boulevard, and Kings Highway. The heavy utilization of the Brighton Subway Line and the Brooklyn College-Flatbush Avenue station of the Nostrand Avenue Line, also shown in Figure II-7, indicates particularly high transit demand among residents in the Nostrand Avenue and Flatbush Avenue corridors who access these rapid transit facilities.

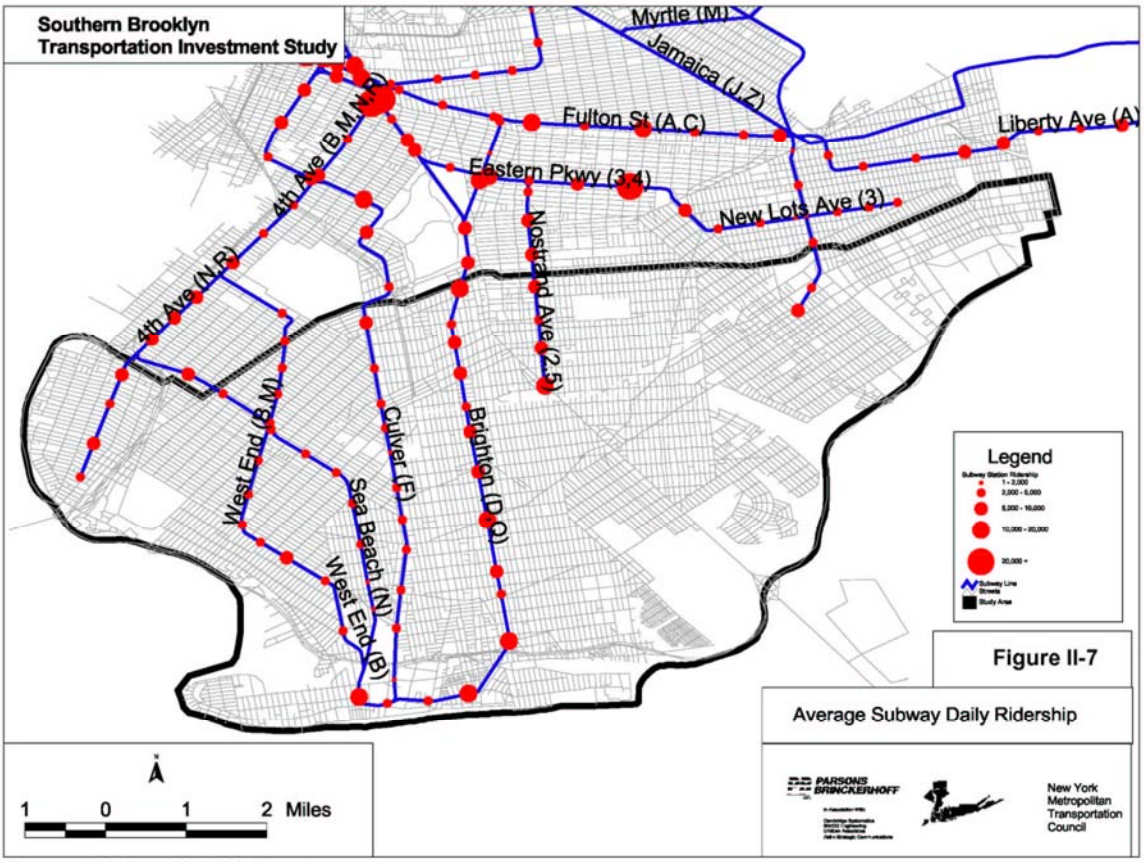
b. Underutilization of Express Subway Track Capacity

A number of subway lines in Southern Brooklyn have three or four tracks in their right of way. These track configurations may provide an opportunity for additional express train service, which is currently offered only on the Brighton Line. This may offer faster travel times to Manhattan for some Southern Brooklyn residents.

c. Planning for Manhattan Bridge Subway Service

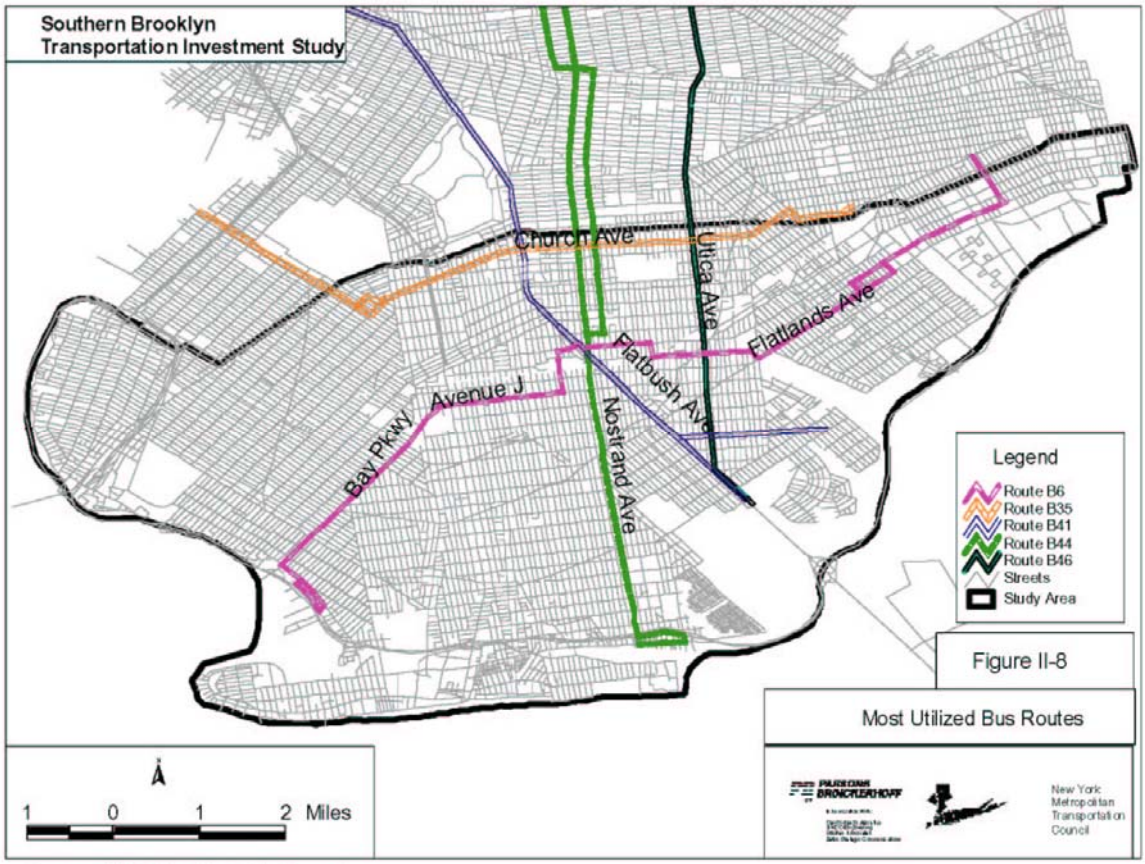
When construction on the Manhattan Bridge concludes, there will be additional train capacity for service between Southern Brooklyn and Manhattan. The Manhattan Bridge provides a connection between the 4th Avenue, Sea Beach, West End, and Brighton Lines in Brooklyn to the Broadway and Sixth Avenue Lines in Manhattan. It will be important for the service pattern across the bridge to take into account Southern Brooklyn travel demand patterns.

FIGURE II-7
AVERAGE SUBWAY DAILY RIDERSHIP



Source: MTA New York City Transit

FIGURE II-8
MOST UTILIZED BUS ROUTES



Source: MTA New York City Transit

d. Increased Transfer Opportunities Between Subway Lines

Although Southern Brooklyn residents are able to transfer between subway lines in several locations, additional opportunities to do so may be created though infrastructure improvements in locations north of the study area. These new transfer points could serve to spread out ridership between lines that have capacity and others that are overcrowded. They may also allow passengers to reach their destinations faster.

e. Bus Route Crowding

Five of the 10 bus routes ranked highest by ridership in the city as a whole operate in Southern Brooklyn. These are shown in Figure II-8, Most Utilized Bus Routes. These and many other bus routes encounter heavy loads throughout the day, and overloading during peak times, as evidenced by MTA-NYCT's service capacity ratings.

f. Slow Bus Operating Speeds

This issue affects numerous routes in the project area, where the overall average speed was 8.0 miles per hour and speeds of just over 6 miles per hour were calculated on several east-west and north-south routes. Causes of slow service in Southern Brooklyn include general congestion, illegal parking and standing of numerous vehicles, time lost through passenger loading and unloading, lack of limited stop services on many routes, and lack of any transit priority treatments. Slow speeds translate into longer trips for passengers, which make bus travel less attractive and competitive with other modes. This increase in running time also results in the need to run additional buses on a given route, increasing the operations cost and requiring additional vehicles that need to be stored at bus depots, where space is at a premium.

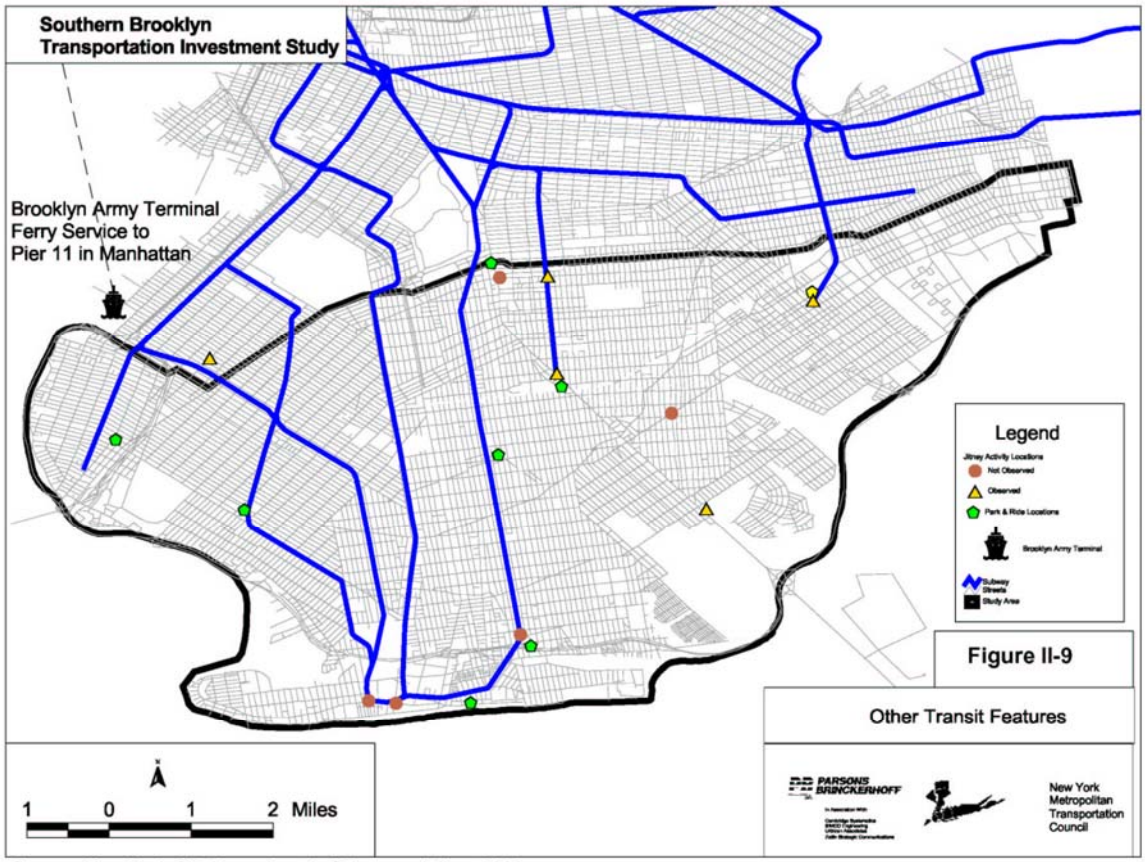
g. Bus Stop Amenities

NYCDOT has done a good job of installing signage at bus stops. However, many stops in Southern Brooklyn lack shelters, and schedules are not always up to date. Improved amenities would provide better service to existing riders and may attract new users.

h. Jitney Services

The consultant team observed a significant amount of jitney van activity at various locations in the study area, shown in Figure II-9, Other Transit Facilities. This indicates that there is a demand for these services, especially in major corridors where no rapid transit service is available. However, individual jitneys were also observed to operate in ways that provide impediments to the effectiveness of the transportation network as a whole, including standing in bus stops, double parking, etc. Another significant issue is that most jitney van services operate in corridors where bus service is available, and in this respect compete with higher capacity vehicles that move people more efficiently.

FIGURE II-9
OTHER TRANSIT FACILITIES



Source: New York City Department of Transportation, 2000

i. Ferry Service in Southern Brooklyn

The successful implementation of the Brooklyn Army Terminal to Lower Manhattan ferry service, as well as the increase in ferry service in the New York City region as a whole, raises possibilities for additional ferry service between various shore points in Southern Brooklyn and both Midtown and Lower Manhattan. This transit mode can serve as a fast, effective addition to the mix of transportation options available to Southern Brooklyn residents.

j. LIRR Brooklyn Branch Reverse Commute Service

While the Long Island Railroad does not operate passenger trains in Southern Brooklyn, a number of major bus routes and subway lines operate from Southern Brooklyn to the Nostrand Avenue and East New York Stations. This provides a transit connection for southern Brooklyn residents accessing destinations in Nassau and Suffolk counties. In order to ensure that such trips are feasible, the frequency and fares for reverse commute LIRR trips will be evaluated.

k. Connections to JFK International Airport

Currently, only the B15 bus provides direct service between Southern Brooklyn and JFKIA, which is a major employment center as well as transportation hub. The B15 serves only a small portion of the study area, and exploration of service to other parts of Southern Brooklyn is warranted.

l. Service to Gateway Mall

The Gateway Mall is a planned commercial center located in the eastern part of the study area and will become a significant new transit generator. When the Mall opens, additional transit service will be needed for shoppers and employees to access this facility.

m. Underutilization of Park and Ride Lots

Despite good conditions and excellent access to transit lines, most of the Park and Ride lots in the study area are far from full utilization. As many residents in Southern Brooklyn own automobiles, and accessing transit via park and rides is more efficient and effective than driving into Manhattan or other regional destinations, the reasons for low utilization and potential measures to overcome it will be explored in subsequent phases of this study.

8. Transportation Improvement Plan (TIP) Projects

As described by NYMTC, the Transportation Improvement Program (TIP) is an improvement program listing that identifies over $20 billion of transportation projects in the region over the next five years. The TIP is a multimodal program of bridge, bikeway, pedestrian, transit, highway, safety, and demand management projects. The TIP, which is updated regularly, includes both federally and nonfederally funded projects. Inclusion of a project in a TIP is a condition for federal funding; however, it does not guarantee it.

Nonfederally funded projects are included for information in order to provide a more comprehensive view of the region's transportation program.

The following table lists NYCT projects programmed on the current FY2002-2004 Transportation Improvement Program that are either within the SBTIS study area, or directly affect it.

TABLE II-12
TRANSPORTATION IMPROVEMENT PLAN (TIP) TRANSIT-RELATED PROJECTS WITHIN OR AFFECTING SBTIS STUDY AREA (FY 2002-2004 TIP)

PIN #	DESCRIPTION
CM09-3936	PURCHASE 150 NEW SUBWAY CARS
CM09-5022	PURCHASE/REBUILD RT CARS: 660 B DIVISION CARS
CM09-5023	PURCHASE 320 NEW SUBWAY CARS
CM12-6493	STEEL WHEEL PROCUREMENT
TR01-5022	CAB SIMULATOR FOR R160 CARS
SF02-2004	BUS REPLACEMENT: PURCHASE 70 CNG BUSES
SF02-5879	BUS REPLACEMENT: 100 CNG BUSES 2002
SF02-5880	BUS REPLACEMENT: 100 OTR EXPRESS BUSES 2002
SF02-5881	BUS REPLACEMENT: ADVANCED TECH BUS DEVELOPMENT
SF02-5940	BUS REPLACEMENT: 50 HYBRID-ELECTRIC BUSES 2003
SF02-6106	BUS REPLACMENT: 260 ARTICULATED BUSES 2002
MW12-5827	STATION REHABILITATION: WATER CONDITION REMEDY 2004
MW12-5829	STATION REHABILITATION: WATER CONDITION REMEDY 2002
RC10-6096	MVM COMMUNICATION PHASE 2
ST06-5831	STATION SIGNAGE 2003
ST06-5832	STATION SIGNAGE 2004
ST07-4612	MYRTLE/WYCKOFF STATION INTERMODAL IMPROVEMENTS
ST07-4671	STATION IMPROVEMENTS: WEST 8TH STREET, BRT
ST07-5503	STATION IMPROVEMENTS: WYCKOFF AVENUE, MYRTLE AVENUE LINE
ST07-5504	STATION IMPROVEMENTS: AVENUE M, BRIGHTON LINE
ST07-5507	STATION IMPROVEMENTS: NECK ROAD BRIGHTON LINE
ST07-5510	STATION IMPROVEMENTS: AVENUE H, BRIGHTON LINE
ST07-5511	STATION IMPROVEMENTS: AVENUE J, BRIGHTON LINE
ST07-5512	STATION IMPROVEMENTS AVENUE U, BRIGHTON LINE
ST07-5834	STATION STRUCTURAL REPAIRS: STATION CONDITION SURVEY
ST07-6348	STATION IMPROVEMENTS: NEPTUNE AVENUE, CUL
ST15-5242	STATION STRUCTURAL REPAIRS: KINGS HIGHWAY, BRIGHTON LINE
MW26-5806	TRACK REHABILITATION: MAINLINE TRACK REHABILITATION IN-HOUSE 2002
MW26-5807	TRACK REHABILITATION: TRACK FORCE ACCOUNT (2002)
MW26-5808	TRACK REHABILITATION: MAINLINE TRACK REHABILITATION IN-HOUSE 2003
MW26-5809	TRACK REHABILITATION: TRACK FORCE ACCOUNT (2003)
MW26-5810	TRACK REHABILITATION: MAINLINE TRACK REHABILITATION IN-HOUSE 2004
MW26-5811	TRACK REHABILITATION: TRACK FORCE ACCOUNT (2004)
MW28-5812	SWITCH REPLACEMENT: MAINLINE SWITCH REPLACEMENT IN-HOUSE 2002
MW28-5813	SWITCH REPLACEMENT: MAINLINE SWITCH REPLACEMENT IN-HOUSE 2003
MW28-5814	SWITCH REPLACEMENT: MAINLINE SWITCH REPLACEMENT IN-HOUSE 2004
MW22-6078	LINE STRUCTURE: NEWKIRK AVENUE STATION PLAZA
MW49-5923	LINE STRUCTURE REHABILITATION: CULVER: AVENUE N-VAN SICLEN-NEPTUNE AVENUE
MW62-6431	OVERCOAT: CULVER LINE, 5 TRESTLES
MW62-6432	LINE STRUCTURE: OVERCOAT, 5 LOCATIONS
MW17-5969	COMMUNICATIONS SYSTEMS: DATA NETWORK: IND/BMT-ATM
MW17-6060	COMMUNICATIONS SYSTEMS: SYSTEM-WIDE APPLICATION MIGRATION PH 1
MW17-6061	COMMUNICATIONS SYSTEMS: SYSTEM-WIDE APPLICATION MIGRATION PH 2
MW43-5878	COMMUNICATIONS SYSTEMS: SYSTEM-WIDE WIRELESS COMMUNICATION SYSTEM
ST12-5276	PA/CIS: CANARSIE LINE 24 STATIONS
EN12-5304	YARD REHAB A AND B DIVISION: NEW YARD, PHASE 1
PP02-6013	YARD REHABILITATION A AND B DIVISION: SECURITY UPGRADE ALL YARDS
SS04-5951	YARD REHABILITATION A AND B DIVISION: YARD HYDRANT SYSTEMS
SF06-4995	KINGS PLAZA BUS TERMINAL IMPROVEMENTS
PL04-4384	POLICE FACILITIES: DISTRICT OFFICE #33, EAST NEW YORK
PL04-5315	POLICE FACILITIES: DISTRICT 34 STILLWELL
PL05-4406	POLICE COMMUNICATIONS: POLICE PORTABLE RADIOS

Source: NYMTC, 2002

Chapter III: Goods Movement

A. OVERVIEW

This chapter describes the state of freight movement in the Southern Brooklyn study area and is comprised of three sections: 1) an inventory of physical systems and infrastructure; 2) an analysis of commodity flows; and 3) an appraisal of goods movement operations by freight system users.

B. PHYSICAL SYSTEM

This section describes the physical transportation systems in the study area that support the movement of freight including highways and rail facilities. Air cargo facilities at JFKIA, while not within the geographic extent of the study area, are also described because of their importance in generating truck drayage to, from, and through the study area. Similarly, there are no significant waterborne cargo facilities within the study area, but those facilities near the study area, especially the South Brooklyn waterfront, are also described in this section.

1. Highway Infrastructure

The study area, because of its dense population and development pattern, has an extensive street network for the delivery of goods and services. Within the study area there are approximately 780 road miles of streets and highways. However, despite its expansive street network, only a small percentage of the study area's streets and highways are legal truck routes (see Figure III-1).

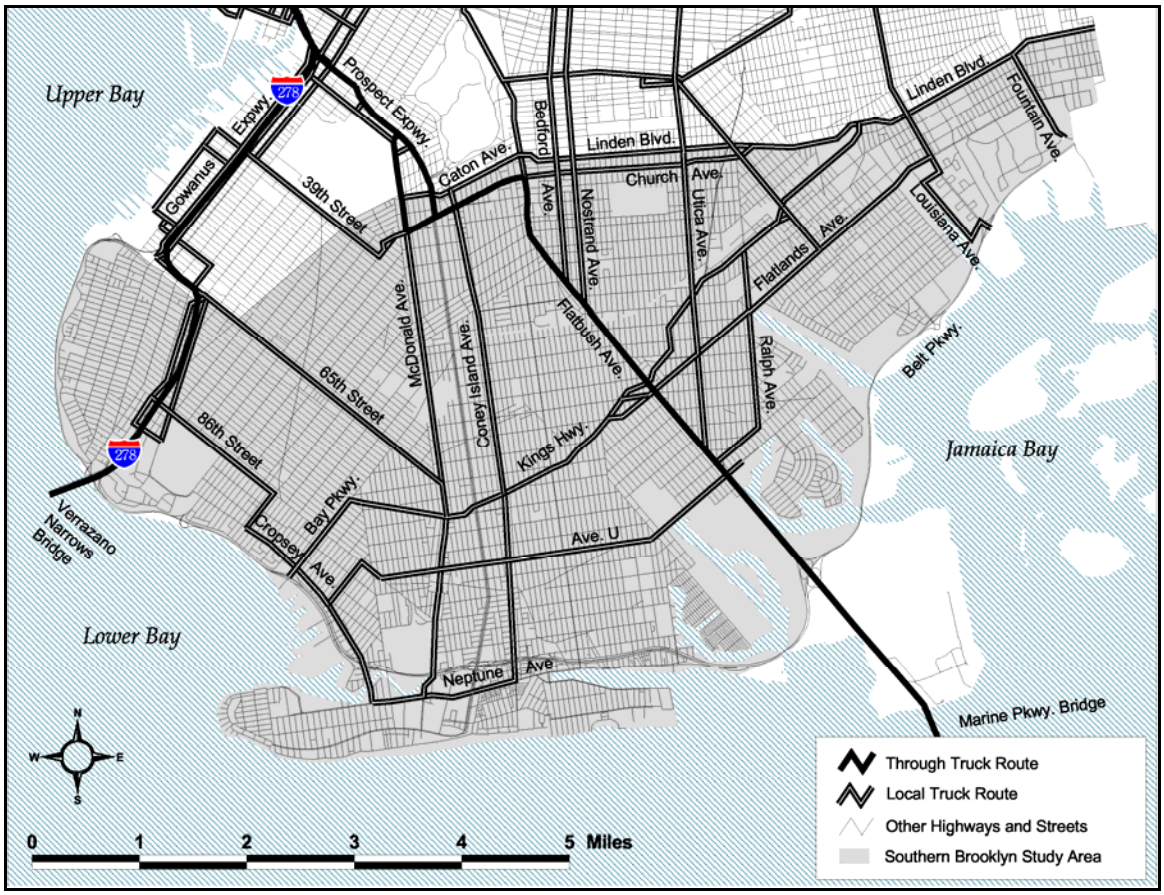
Of the approximately 780 road miles of streets and highways in the study area, roughly 63.7 miles are legal truck routes. Of those 63.7 miles of truck route, about 55.3 miles are designated for local trucks and roughly 8.4 miles are designated for through trucks. Thus, trucks are allowed on approximately 8.2 percent of all streets and highways in the study area; through and local routes accounting for approximately 1 percent and 7 percent, respectively.

a. Truck Routes

Through truck routes are defined as those expressways and principal arterials that permit through and local trucks. The *New York City Traffic Rules* define through trucks as having neither an origin nor a destination within the Borough of Brooklyn.[1] Local trucks are defined as those commercial vehicles with either an origin or destination within the Borough of Brooklyn. Local trucks are required to use either through or local truck routes as much as possible to access their origins and destinations. Where those origins and destinations are not on a truck route, the operator should take the most direct route possible.

[1] New York City Traffic Rules Section 4-13(e)

FIGURE III-1
SBTIS TRUCK ROUTES



Through Truck Network. The principal through truck route in the study area is the Gowanus Expressway (Interstate 278). The Gowanus Expressway carries commercial and personal vehicles between the terminus of the Verrazano-Narrows Bridge and Downtown Brooklyn where I-278 becomes the Brooklyn-Queens Expressway and eventually converges with the Long Island Expressway (I-495) in the Borough of Queens. The Gowanus Expressway is the most important through truck route in the study area because it is the only interstate highway connecting destinations south and west of the study area in New Jersey and beyond with Long Island. The Gowanus also delivers freight destined for Southern Brooklyn traveling from the Midwestern U.S.A., Upstate New York, and New England via either the George Washington Bridge, Throggs Neck Bridge, or Whitestone Bridge.

The Gowanus Expressway generally has three-lanes in each direction. The Expressway has a posted speed limit of 50 miles per hour. The recently published Task 2 Final Technical Memorandum from the NYMTC Regional Freight Plan contains a concise description of the design features and operating characteristics of the Gowanus Expressway through the study area. The following description is excerpted from that document:

> From the Verrazano-Narrows Bridge to 65th Street, eastbound lanes are separated from westbound lanes by a grassy median that varies in width from 13 to 33 feet. This section also has paved shoulders of 10.75 feet on the right side in each direction with mountable curbing at the edge of the travel lane. Between 65th Street and the Shore Parkway Merge, the eastbound direction drops from three general purpose lanes to two; the third lane (left lane) becomes the "Blue Lane" which is restricted to HOV-3 buses and medallion taxis from 6:00 a.m. to 10:00 a.m. but serve as a shoulder lane during other times. From about 65th Street [which is the northern extent of the study area] to its northern terminus, the Gowanus is an elevated roadway with a median barrier separating the eastbound and westbound directions, and does not have usable shoulders. Below the elevated highway, 65th Street, Third Avenue, and Hamilton Avenue act as the service road. There are no vertical clearance issues.

Local Truck Network. The local truck network in the study area (see Figure III-1) is more extensive than the through truck network as it provides more direct access to local origins and destinations. The Truck Routes Map shows the location of the local truck routes in the study area. The *New York City Traffic Rules* note the following height restrictions on local truck routes in the study area:

- Avenue U - 12' -5" at BMT Brighton Line (at East 16th Street)
- Bay Parkway - 11' -6" at West End Line (at 86th Street)
- Kings Highway - 12' -2" at BMT Brighton Line (at East 16th Street)
- Remsen Avenue - 12' -0" at Long Island Rail Road (Bay Ridge Branch) between Avenue D and Ditmars Avenue

b. River Crossings

Another important element in the study area's freight highway system is bridge infrastructure. The Task 2 Final Technical Memorandum of the Regional Freight Plan offers descriptions of all river crossings, both tunnel and bridge, in the NYMTC region. Of those river crossings, only one, the Verrazano-Narrows Bridge, connects directly with the study area. The following description of the Verrazano-Narrows Bridge is excerpted from the Regional Freight Plan:

> The Verrazano-Narrows Bridge has an upper level and a lower level and carriers three lanes in each direction for each level. Unlike other Metropolitan Transportation Authority Bridges and Tunnels (MTAB&T) facilities, which collect identical tolls for both directions of travel, the Verrazano-narrows Bridge collects a toll only in the westbound direction but charges the toll based on both eastbound and westbound travel. EZ-Pass is available.
>
> The Verrazano-Narrows Bridge is the only Hudson River crossing between Staten Island and Brooklyn and points east.

The Regional Freight Plan also points out that truck AADT is likely higher eastbound on the Verrazano-Narrows Bridge than westbound and consequently north/eastbound on the Gowanus Expressway because tolls are charged for westbound traffic only. For example, a 5-axle truck using a combination of either the Outerbridge Crossing, Goethal's Bridge and the Verrazano-Narrows Bridge eastbound to a East-of-Hudson destination and then returning westbound on the George Washington Bridge would save between $17.50 (overnight truck rate) and $30.00 (peak-hour truck rate) over the opposite routing (George Washington Bridge eastbound and Verrazano-Narrows Bridge westbound). Thus, trucks can minimize river crossing tolls by traveling eastbound on the Verrazano-Narrows Bridge and westbound over the George Washington Bridge via the Cross-Bronx or Major Deegan Expressways. The operational characteristics and performance of the Verrazano-Narrows Bridge and other primary truck routes are presented in Section C., below.

2. Rail Freight Infrastructure

Within the greater New York region, a significant disparity exists between freight railway service west and east of the Hudson River. West of the Hudson, the New Jersey freight rail system is extensive and well connected to the continental routes. East of the Hudson, the freight rail system is extremely limited.

a. Bay Ridge Branch

Within the study area rail infrastructure is limited to approximately 6.5 miles of freight rail right-of-way. The entire 6.5-mile segment of freight rail passing through the study area is comprised of the Bay Ridge Branch owned by the Long Island Rail Road and operated by New York and Atlantic (NY&A) Railway.[2]

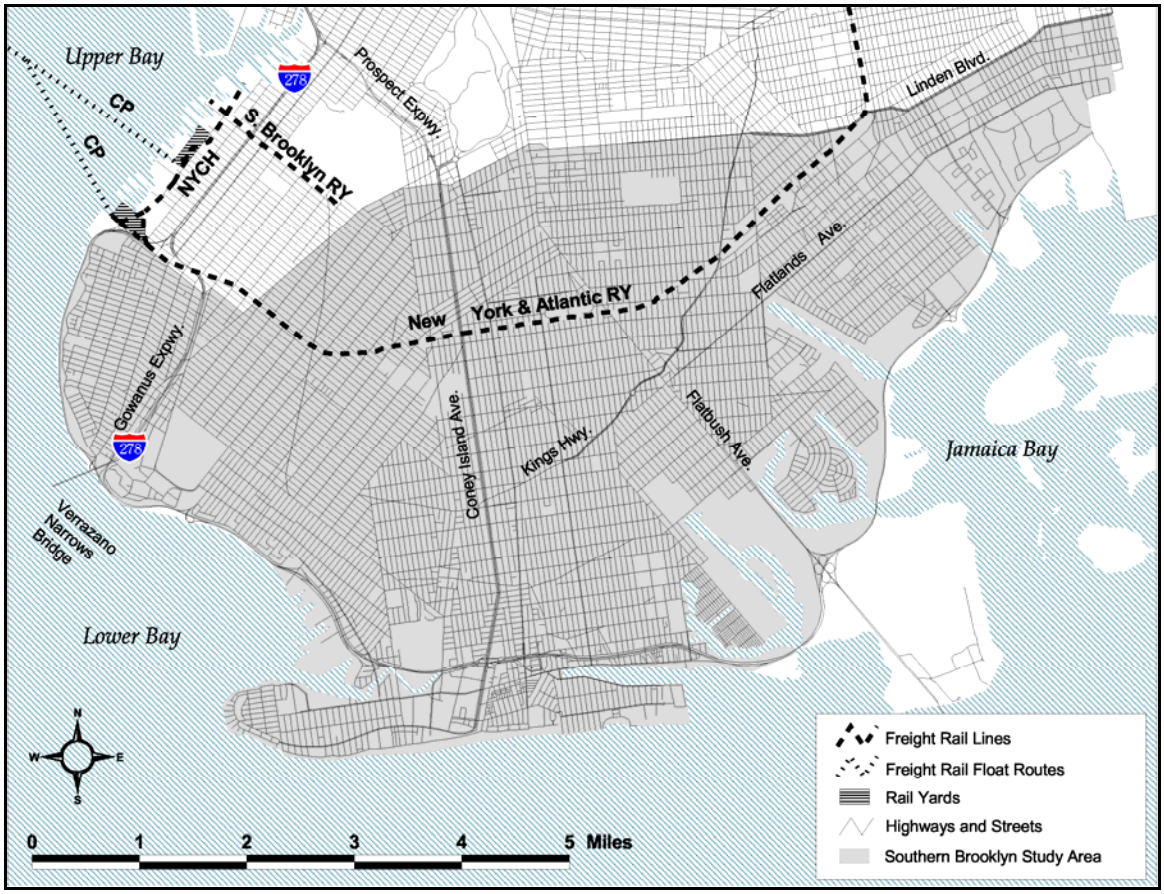
The Bay Ridge Branch, from its terminus at the 65th Street Railyard to the vicinity of Avenue H and East 41st Street, is a below-grade cut with generally one operational track.[3] From the vicinity of Avenue H and East 41st Street in the eastern portion of the study area to its junction with the Montauk Branch in Queens, the Bay Ridge Branch runs above grade on an earthen embankment and bridges over streets and highways.

Within part of the below-grade cut, between approximately 6th Avenue and 14th Avenue, the right-of-way also contains at least two MTA subway tracks of the Sea Beach Line (N). Immediately northeast of the study area, the Bay Ridge Branch again shares its right-of-way with the MTA's L and M lines. That stretch of shared, above-grade right-of-way also contains separate tracks for MTA and NY&A trains and extends from the vicinity of Linden Boulevard and Avenue D to approximately Cooper Street and Decatur Street. North of the study area, in Queens, the NY&A converges with Canadian Pacific, CSX, and Providence and Worchester rail systems at Fresh Ponds Yard. From that point, rail freight continues north via the Hell Gate Bridge. Thus, the NY&A's operations via

2 New York & Atlantic Railway (http://www.anacostia.com/nyar/nyar.html)
3 NYMTC Freight Facilities and System Inventory, August 2000

Upper New York Bay carfloats and the Bay Ridge Line connect freight customers in New Jersey to Long Island and points north.

FIGURE III-2
SBTIS RAIL



The Bay Ridge Branch has sufficient right-of-way for two tracks. However there is an existing 12" petroleum pipeline within the right-of-way that would have to be relocated for placement of another track.[4] The other physical impediments on the Bay Ridge Branch are vertical clearances. There are 32 total vertical clearances, most of which are 17 to 18 feet. The current clearance is sufficient for typical unit train movement (boxcars, tankers, hoppers etc.) and single-stack container on flatcar (COFC) movements but insufficient for larger intermodal operations, including trailer on flatcar (TOFC) or double-stack containers. At a minimum, clearances must be at least 20'6" to accommodate the various types of intermodal equipment, including TOFC (17'7" minimum); double-stack containers (COFC) (20'2"); and tri-level auto carriers (20'2"). Where overhead catenary wires are used to power trains electrically, a clearance of 22'6" is necessary to accommodate widely used intermodal equipment and overhead electric power.

4 The pipeline is owned and operated by Buckeye Pipe Line Company, L.C. and carries petroleum products between Allentown, Pennsylvania and John F. Kennedy International Airport.

The Bay Ridge Branch is part of NY&A's 269-mile route system through Brooklyn, Queens, Nassau, and Suffolk Counties. It runs adjacent to the Brooklyn Terminal Market, where NY&A operates a transload facility for food, produce, and canned goods. New York & Atlantic operates approximately one train per day on the Bay Ridge Branch.

The Bay Ridge Branch is connected to the national rail system and the West of Hudson region in two ways: via a rail "float bridge" operating from Sunset Park (where railcars are loaded onto barges and towed across the harbor to New Jersey, and vice versa); and northbound over the Hell Gate Bridge, connecting to the CSX Hudson Line, which runs on the east side of the Hudson River until reaching a crossing at Selkirk, NY (near Albany). The New York City Economic Development Corporation is currently leading a study of alternatives for improved rail connections, including an enhanced float operation and a cross-harbor rail freight tunnel. Both these operations would be physically located outside the SBTIS study area, but if implemented, would generate substantially increased use of the Bay Ridge Branch for rail freight.

b. Rail Facilities Adjoining the Study Area

Immediately adjacent to the northwest corner of the study area, the Bay Ridge Branch terminates at the 65th Street Railyard. At that yard, which is owned by the New York City Economic Development Corporation (NYCEDC) and operated by the New York and Atlantic Railway, rail operations converge with the New York Cross Harbor Rail Road (NYCH). The 65th Street Yard includes 33 acres and is comprised of 13 tracks – nine for classification (train assembly), two for intermodal, and two for transloading.[5] All 13 tracks are 1,500 feet long and are capable of accommodating 40 cars each. The 65th Street Railyard also includes two newly-constructed rail float bridges, which are planned to provide improved rail float service between Brooklyn and Greenville Yard in New Jersey; float service (not yet operational) will be provided by the CP Railway. Trucks enter the yard from 58th Street and 1st Avenue.

The New York Cross Harbor Rail Road operates approximately 1.7 miles of track on the South Brooklyn Waterfront, primarily on 1st Avenue and 2nd Avenue. NYCH operates a rail float service between Brooklyn and Greenville via a transfer bridge at 51st Street. NYCH also operates the Bush Terminal Yard (also owned by NYCEDC), a small (11-acre, five track) switching yard generally between 42nd Street and 50th Street. Truck access to the yard is primarily from the 38th/39th Street exit to the Gowanus Expressway.

Another railway system immediately adjacent to the study area is the South Brooklyn Railway (SBK). The South Brooklyn Railway is the freight operating division of the MTA and operates primarily on a section of track commencing at the NYCH Line on the South Brooklyn waterfront and 10th Avenue, between 38th and 39th Streets. The total length of the SBK operating system is approximately 1.5 miles and the company primarily functions in and around the 39th Street scrapyard and delivering new cars from

5 Additional information on nearby rail facilities from NYMTC Freight Facilities and System Inventory, August 2000

the Linden Shops in the eastern portion of the study area[6]. SBK's sole customer is the MTA.

On the New Jersey side of Upper New York Bay, the Greenville Yard, operated by NYCH, serves as the interchange location for rail cars coming to and from Norfolk Southern (NS) and CSX mainlines as part of the shared assets (Conrail) operation of NS and CSX.[7]

3. Air Cargo Facilities

There are no air cargo facilities within either the SBTIS primary study area or the Borough of Brooklyn. Nonetheless, because of the proximity of cargo facilities at JFKIA (supplemental study area) to the primary study area, it is important to describe those facilities as they relate to the transit of air cargo by truck through Southern Brooklyn.

JFKIA is one of the largest air cargo airports in the world, ranking 11th for total tonnage in 2001 internationally and 6th nationally[8]. The Port Authority of New York and New Jersey operates the airport through a lease from the City of New York. The airport's total land area is 4,930 acres. The airport's central terminal area occupies 880 acres. There are thirty-five warehouses and cargo handling facilities on the airport grounds totaling over 4.8 million square feet of cargo building space. Currently 38 cargo airlines serve the airport and the airport is capable of handling most any type of cargo, including perishable items in refrigerated facilities owned by private airlines. The airport also houses the largest customs clearance operation in the Untied States and utilizes the latest technologies, including electronic cargo clearance, to track cargo through the clearance process.[9]

In addition to the airport cargo facilities, there are also numerous break-bulk facilities that generate through truck trips to the study area. These facilities, located near the airport in communities such as Ozone Park, specialize in redistribution of air cargo for truck shipments.

The routes of airport-bound trucks will be discussed more fully in Section C. on Operational Characteristics and Demand, but it is important to mention that the trucks traveling through the study area to and from the airport principally utilize the following route: Van Wyck to Long Island Expressway to the Brooklyn-Queens Expressway/ Gowanus Expressway.

Currently the airport is only served by truck. There are no facilities to transfer air cargo to either marine or rail transportation at the airport.

---

6 Information on South Brooklyn Railway from NYMTC Freight Facilities and System Inventory, August 2000 and from www.nyrail.org/nyct/sbk/

7 Additional information on NY&A from NYMTC Freight Facilities and System Inventory, August 2000

8 Airports Council International Traffic Data: World airports ranking by total cargo - 2001

9 NYMTC Freight Facilities and System Inventory, August 2000

4. Marine Cargo Facilities

There are no public (e.g., facilities that serve multiple freight shippers and carriers) marine cargo terminals in the SBTIS study area. However, there are three public marine cargo facilities elsewhere in Brooklyn that impact, to a limited extent, the SBTIS study area:

- **Red Hook.** The Red Hook Marine Terminal, located at the western terminus of Atlantic Avenue (on top of the Brooklyn-Battery Tunnel), is operated by American Stevedoring, Inc. The terminal covers approximately 80 acres, of which approximately 35 acres are dedicated to container storage. The other acreage is occupied by support operations such as gate, administration, and maintenance facilities, as well as other cargoes such as cocoa, salt and vehicles. The terminal is owned by the City of New York and managed by NYCEDC. The property is leased by NYCEDC to the Port Authority of New York and New Jersey (PANYNJ), which in turn leases it to American Stevedoring, Inc. The Red Hook Marine Terminal generally handles about three percent of the port's container throughput (around 60,000 annually). About 80 percent of these containers are floated to New Jersey via container barge; the other 20 percent arrive and depart by truck, using the Gowanus Expressway or local streets (principally Van Brunt Street, Hamilton Avenue, and Atlantic Avenue).
- **Brooklyn Marine Terminal.** The Port Authority of New York and New Jersey owns the Brooklyn Marine Terminal (Brooklyn Piers 6, 7 and 8), located immediately north of the Red Hook Marine Terminal. Cargo sheds on these piers are operated by American Stevedoring, Inc. and used for the storage of cocoa beans.
- **South Brooklyn Marine Terminal.** The South Brooklyn Marine Terminal (SBMT) is located north of 39th Street along the Sunset Park waterfront. Once an operational 111-acre container terminal, the facility is no longer active, and its land is being used for automobile storage, cocoa warehousing, and other functions. The NYCEDC has proposed to reactivate the facility as an auto marine terminal (Carport) in the near term, and to potentially redevelop it as a major container terminal in the long term. SBMT has a rail connection to the NYCH via 1st Avenue. The primary truck arterials serving SBMT are the Gowanus Expressway and Third Avenue (located directly under the Gowanus Expressway); two interchanges connect the Gowanus Expressway and these waterfront areas at 38th/39th Streets and 62nd/65th Streets. There is a southbound off-ramp at 39th Street and a northbound off-ramp at 38th Street, but there is no access to the Gowanus at these locations. Consequently, truck traffic leaving the area can access the regional highway system only by traveling south to the 65th interchange on the local arterials, or by traveling north to the Prospect interchange. There are a complex series of connections between the Gowanus Expressway, local streets, and the Shore Parkway between 62nd and 65th Streets, and between Third and Sixth Avenues.

NYMTC has identified a total of 376 marine cargo facilities within in the region. This includes the public marine terminals, privately-owned marine terminals, and special purpose publicly-owned facilities (sanitation piers, Navy or Coast Guard facilities, etc.). There are 55 such facilities within Kings County, including: 14 petroleum terminals; 12

general cargo (container and non-container) terminals; 8 rock/stone/sand/gravel terminals; 6 fuel oil terminals; and 15 terminals with other purposes.

As illustrated in Figure III-3, there are relatively few marine terminal facilities in the SBTIS study area, compared to northern Brooklyn and Queens. The NYMTC database identifies 13 marine cargo facilities in the SBTIS study area (see Table III-1); these are primarily involved in the handling of petroleum, construction equipment, fish, and waste products.

FIGURE III-3
LOCATION OF PUBLIC MARINE CARGO TERMINALS IN NEW YORK HARBOR

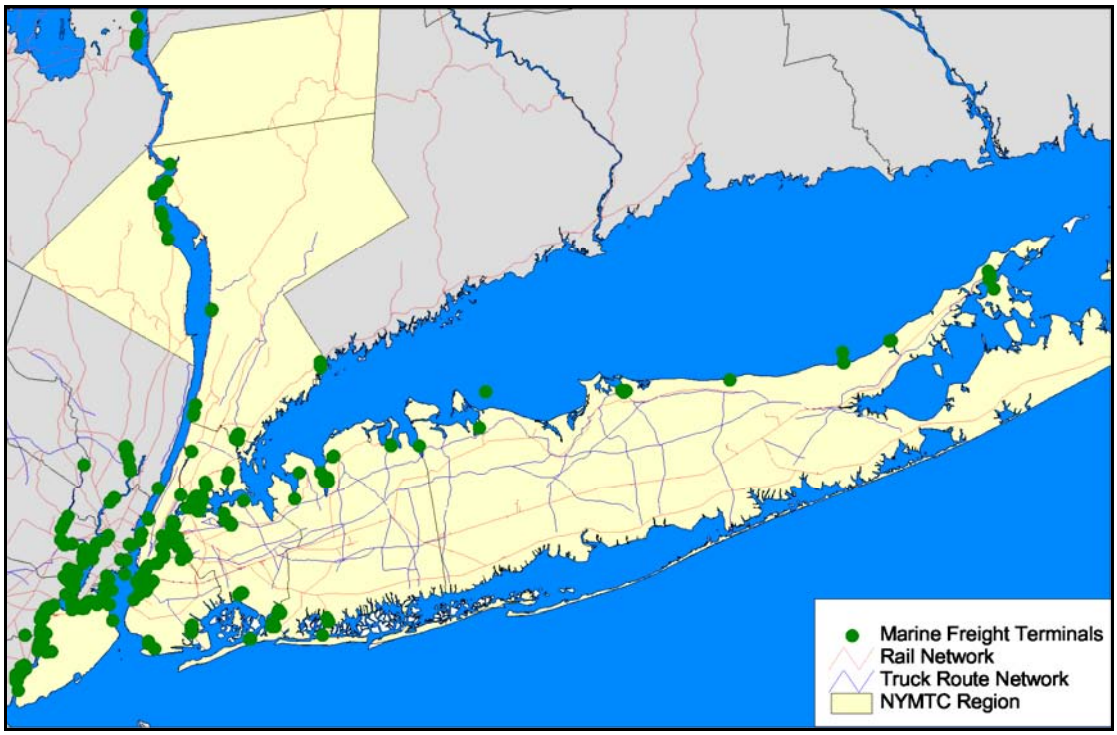
Source: PANYNJ

TABLE III-1
MARINE FACILITIES IN THE SBTIS STUDY AREA

Name	Wharf Location	PURPOSE
26th Ward Water Pollution Control Plant Pier.	Jamaica Bay	Disposal of sludge by vessel.
Jiggy Pile Driving Corp., West Wharf.	Jamaica Bay	Occasional handling of construction equipment and supplies.
Jiggy Pile Driving Corp., East Wharf.	Jamaica Bay	Occasional handling of construction supplies.
A. R. Fuels Wharf.	Jamaica Bay	Receipt of petroleum products by barge.
Ultramar Petroleum, Madison Terminal Wharf.	Jamaica Bay	Receipt of petroleum products by barge.
Hunter Fish Packing Co. Wharf.	Jamaica Bay	Receipt of fish; mooring fishing boat.
Nicholas Ross, Lobster Wharf.	Jamaica Bay	Receipt of lobsters; mooring lobster fishing boat.
Coney Island Water Pollution Control Plant, Sludge Wharf.	Sheepshead Bay	Disposal of sludge by vessel.
Greco Bros., Ready Mix Concrete Co.	Coney Island Creek	Receipt of crushed stone by barge.
Department of Sanitation Incinerator Wharf.	Gravesend Bay	Shipment of ashes and residue from incinerator by barge.
Department of Sanitation Barge Slip.	Gravesend Bay	Shipment of refuse by barge; mooring barges.
Bayside Fuel Oil Depot Corp., Bensonhurst Terminal Pier.	Gravesend Bay	Receipt of petroleum products by barge for local distribution.
Owls Head Pollution Control Plant Wharf.	Bay Ridge Channel	Disposal of sludge by vessel.

Source: NYMTC

FIGURE III-4
LOCATION OF WHARVES AND DOCKS IN THE REGION



Source: NYMTC

C. OPERATIONAL CHARACTERISTICS AND DEMAND

1. Commodity Flows

a. Commodity Flow Analysis Methodology

This analysis utilizes a commodity flow database known as Transearch, which was developed by Reebie Associates and is based on data from 2000 (the most recent dataset available at the time). Transearch provides national-level information on the movements of various types of commodities between specific origins and destinations using different modes of transportation. Information on airborne, waterborne, and rail movements is extracted from federal databases, while information on trucking activity is generated by Reebie Associates using proprietary methods.

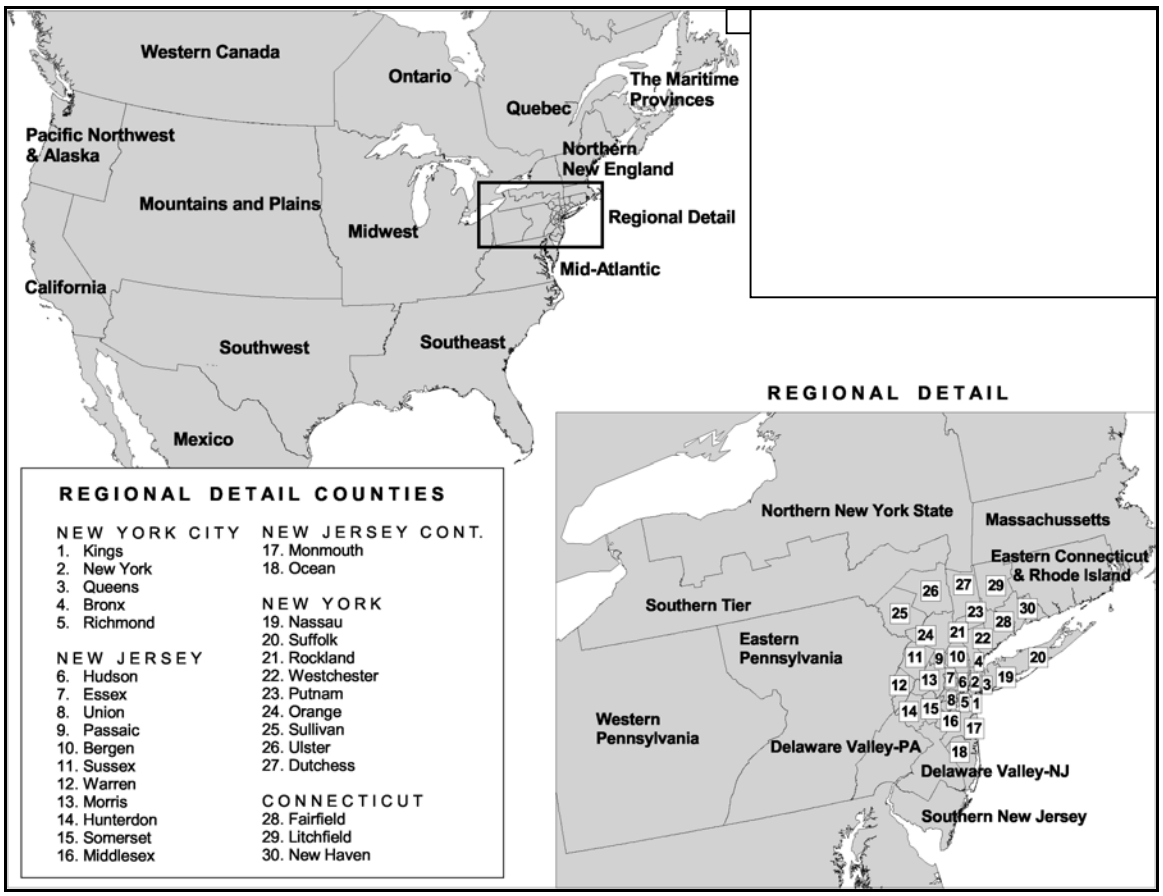
The commodity flow analysis in this study uses a geographical zone structure that divides North America into 52 zones, of which 30 represent the counties of the New York/Northern New Jersey metropolitan area. All inbound, outbound, internal, and through goods movements from these zones relative to Brooklyn (Kings County) are included in this analysis. Because the Transearch database does not divide regions into geographical units smaller than counties, this analysis considers goods movement data for the entire Borough and not for a subdivision based on the study area boundaries.

The remaining 22 zones comprise external regions of aggregated counties or states. Information about goods movements between these "external" regions and Brooklyn is also documented, including flows to and from Canada provinces and the country of Mexico. These more geographically remote regions are constructed of areas that share common freight distribution patterns and service characteristics for trade with the New York/Northern New Jersey region. Because they are aggregated at a higher level, they provide less detail than the county-level information conveyed by Brooklyn's immediate neighbors.

The following map shows the composition and location of the regions used in this analysis.

In addition to the origin-destination (o-d) information and directionality of freight flows, the Transearch database reports annual tonnage by commodity type. Commodity types are defined according to their Standard Transportation Commodity Code (STCC). Levels of STCC correspond to different levels of detail. The four-digit level makes very fine distinctions among specific commodity types, while the two-digit level aggregates similar commodity types into larger functional classes. For example, STCC 3273 (Ready-Mix Concrete) and STCC 3271 (Concrete Products) are both included in STCC 32 (Clay, Concrete, Glass, and Stone). Generally, domestic movements are captured at the four-digit level, while the international flows are typically reported at the two-digit level. Since we included the international flows in this analysis, the results will largely be portrayed at the two-digit STCC level. The relationships between the major two-level and four-level STCC codes are presented in Table III-2.

FIGURE III-5
COMMODITY FLOW DATA TRADE REGIONS



Tonnage by two-digit commodity was also expressed in value, which was based on average commodity values calculated for a regional selection of the 1993 national Commodity Flow Survey (CFS) produced by U.S. DOT. All dollar values have been inflated to FY 2000 dollars using GDP inflation factors produced by the Bureau of Economic Analysis (BEA). Values were computed by multiplying the average value per ton for a particular two-digit commodity by its reported annual tonnage, as illustrated below:

Annual Tonnage STCC 1 * Average Value $/Ton STCC1 = Total Value STCC 1

Since the values are estimated, more emphasis is placed on measurement of commodity flows by weight. It is important to note that the dollar values were derived, and not part of the original data.

TABLE III-2
STANDARD TRANSPORTATION COMMODITY CODE DESCRIPTIONS

STCC 2	Name	Commodities Included at the STCC 4 Level
1	Farm products	Grains, field crops, fruits, and vegetables
10	Metallic ores	Bauxite, aluminum ores
11	Coal	Bituminous coal
14	Nonmetallic minerals	Broken stone, gravel, sand, mineral fertilizers
19	Ordnance or accessories	Guns, ammunition
20	Food or kindred products	Meat products, poultry, dairy products, flour and sugar, liquors, soft drinks, edible oils
21	Tobacco products	Cigarettes
22	Textile mill products	Cotton fabrics, carpets, yarns
23	Apparel or related products	Clothing
24	Lumber or wood products	Primary forest materials, lumber, plywood, veneers, millwork, and cabinetwork
25	Furniture or fixtures	Furniture
26	Pulp, paper, or allied products	Pulp and pulp mill products, paper, fiber, wallpaper, paper containers, and boxes
27	Printed matter	Newspapers, periodicals, greeting cards
28	Chemicals or allied products	Potassium and sodium compounds,
29	Petroleum or coal products	Refining products, liquefied gases, asphalt
30	Rubber or misc. plastics	Tires, miscellaneous plastic products
31	Leather or leather products	Leather products
32	Clay, concrete, glass, or stone	Portland cement, clay brick or tile, concrete products, ready-mix wet cement, gypsum, processed nonmetallic minerals, kaolin clay
33	Primary metal products	Petroleum coke, primary iron and steel products, copper, aluminum and lead products, wire
34	Fabricated metal products	Heating equipment, sheet metal products, valves, pipe fittings
35	Machinery	Engines, farm machinery, construction equipment, lawn and garden equipment, machine tools
36	Electrical equipment	Transformers, motors and generators, batteries, cooking equipment, lighting fixtures
37	Transportation equipment	Car bodies, truck bodies, bus bodies, aircraft, railcars, vehicle parts and accessories
38	Instrum, photo equip, optical eq	Photographic equipment or supplies
39	Misc. manufacturing products	Furs, matches, toys, games
40	Waste or scrap materials	Metal scrap or tailings, paper waste or scrap
41	Misc. freight shipments	Miscellaneous freight shipments
42	Shipping containers	Empty shipping containers
43	Mail or contract traffic	Mail
45	Shipper association traffic	Shipper association traffic
46	Misc. mixed shipments	Freight all kinds, including loaded shipping containers not elsewhere classified
48	Chemical or allied products	Chemicals
50	Secondary traffic	Warehouse and distribution traffic for a wide variety of commodity types; intermodal drayage

b. Goods Movement Patterns

During 2000, over 143 millions of tons of freight valued at $353 billion moved inbound, outbound, through, and within Brooklyn. The following sections present the goods movement data in terms of top commodities by tonnage and value, by direction, by mode, and by specific origin and destination.

c. Top Commodities by Tonnage and Value

The first level of this data analysis identifies the highest tonnage and value classes of freight of the total movement of all modes: truck, water, and rail. This analysis finds that several classes of freight dominate goods movement in Brooklyn. The most important commodity class in terms of total tonnage is petroleum and coal products. That class accounts for nearly 30 percent of all tonnage of freight moved in the Borough. The other top commodity classes include food and kindred products with 16 percent of total tonnage; and clay, concrete, glass or stone products with 10.5 percent of total tonnage. Together, these top three classes account for 56 percent of the total tonnage of goods moved in the Borough. Other leading tonnage commodities include chemicals or allied products; secondary traffic (warehouse and distribution traffic); lumber; paper; and metal products. The following table lists the tonnage of the top twenty commodities in Brooklyn.

TABLE III-3
TOP TONNAGE COMMODITIES

STCC 2 Description	2000 Tonnage	% of total
Petroleum or coal products	42,650,010	29.8
Food and kindred products	22,873,336	16.0
Clay, concrete, glass or stone products	14,990,798	10.5
Chemicals or allied products	9,669,086	6.8
Secondary traffic	7,626,034	5.3
Lumber or wood products, ex. furniture	7,122,966	5.0
Pulp, paper, or allied products	6,125,506	4.3
Primary metal products	4,886,046	3.4
Fabricated metal products	4,286,223	3.0
Transportation equipment	2,731,130	1.9
Rubber or miscellaneous plastics products	2,411,900	1.7
Machinery, ex. Electrical	2,220,245	1.6
Printed matter	2,149,513	1.5
Furniture or fixtures	1,808,965	1.3
Apparel or other finished textile or knit products	1,768,846	1.2
Electrical machinery, equipment or supplies	1,679,581	1.2
Farm products	1,662,085	1.2
Waste or scrap materials	1,577,003	1.1
Textile mill products	1,067,353	0.7
Miscellaneous manufacturing products	940,055	0.7

Source: CSI analysis of Reebie Transearch Data 2000

The top value commodity classes differ from the top tonnage classes. The highest value commodity classes are machinery and apparel. These two classes represent 13.1 percent and 12.3 percent, respectively, of the total value of goods movement in Brooklyn. Other high-value classes include electrical equipment (10.8 percent); transportation equipment (9.6 percent); and food and kindred products (8.3 percent). The table below lists the top twenty commodity classes by value and by their respective percentage of total value.

TABLE III-4
TOP VALUE COMMODITIES

STCC 2 Description	Total Value (2000 $s)	% of total
Machinery	46,354,554,858.77	13.1
Apparel or related products	43,470,146,513.95	12.3
Electrical equipment	37,953,365,007.89	10.8
Transportation equipment	33,894,144,524.67	9.6
Food or kindred products	29,325,383,215.03	8.3
Leather or leather products	18,065,493,679.42	5.1
Instruments, photo equip., optical equip.	15,950,017,302.83	4.5
Lumber of wood products	15,339,860,125.46	4.3
Chemicals or allied products	14,311,017,970.28	4.1
Rubber or misc. plastics	13,748,383,288.69	3.9
Fabricated metal products	12,784,840,058.54	3.6
Petroleum or coal products	10,907,467,407.25	3.1
Misc. manufacturing products	10,271,447,815.31	2.9
Furniture or fixtures	9,443,443,880.85	2.7
Secondary traffic	7,810,000,796.34	2.2
Pulp, paper, or allied products	7,764,839,997.80	2.2
Textile mill products	6,490,525,546.27	1.8
Printed matter	4,855,835,123.85	1.4
Primary metal products	3,984,043,953.79	1.1
Misc. freight shipments	3,425,525,769.19	1.0

Source: CSI analysis of Reebie Transearch 2000 data

d. Commodity Directionality

The Transearch 2000 database divides goods movement data into four categories based on the direction the shipment is moving. The four types of moves are defined as follows:

- Rail, truck, and water tonnage with domestic and international (Mexico and Canada) origins that is destined for Brooklyn (***inbound movements***);
- Rail, truck, and water tonnage originating in Brooklyn and flowing to other domestic and international destinations (***outbound movements***);
- Domestic truck and water tonnage moved entirely within Brooklyn (***internal movements***); and,

- Domestic truck tonnage that passed through Brooklyn with an origin and destination outside of Brooklyn (***through movements***).[10]

With these definitions in mind, the directionality of tonnage moving inbound, outbound, internally, and through Brooklyn is described by the following figure.

FIGURE III-6
DIRECTION OF TONNAGE

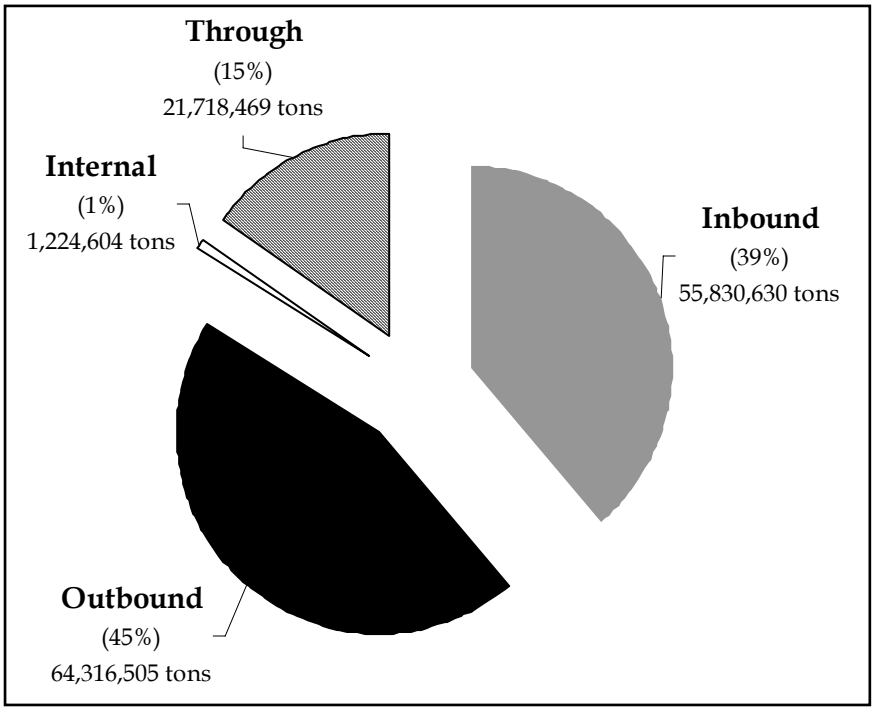


Figure III-6 shows the leading direction of goods movement is outbound, accounting for 45 percent of all tonnage. Next is inbound tonnage with a 39 percent share of all movement followed by through tonnage, which accounts for 15 percent of the total. Finally, internal tonnage represents approximately 1 percent of tonnage.

Each goods movement direction is dominated by a different set of commodities. The leading outbound commodity class for Brooklyn is petroleum and coal products representing 57 percent of the total outbound tonnage. Other important outbound commodity classes include food and kindred products (11 percent); clay, concrete, glass, or stone products (6 percent); chemicals or allied products (5 percent); and waste or scrap materials (2 percent).

[10] Through moves are based on the routing assignments of the Transearch model and are most accurate at a national level. At the regional or city level, the accuracy of routing assignments may decrease because specific and complex intra-city routing decisions may be precluded from the model. In the case of through moves with origins or destinations in Queens or other Long Island jurisdictions, the Transearch data tends to assume a higher proportion of westbound traffic travels through Brooklyn than may actually be the case.

The leading inbound commodity class to Brooklyn is food and kindred products representing 21 percent of the total inbound tonnage. Other important commodity classes include clay, concrete, glass, or stone products (15 percent); lumber or wood products excluding furniture (9 percent); chemicals or allied products (9 percent); and pulp, paper, or allied products (7 percent).

The food and kindred products class is the top through commodity class with 18 percent of the total through tonnage. Food products are followed by secondary traffic (primarily warehouse and distribution traffic) with 15 percent of the tonnage and by the class representing clay, concrete, glass, or stone products with 14 percent of the tonnage. Primary metal products; and chemical and allied products are the fourth and fifth through tonnage classes with 9 percent and 7 percent of the total through tonnage, respectively.

The petroleum and coal products class dominates internal tonnage movement with 90 percent of the total. Other internal classes include farm products (fruits, vegetables, field crops and grain); secondary traffic (warehouse and distribution traffic); and food and kindred products. The following set of tables shows the top five commodities by percentage of total tonnage for each direction.

TABLE III-5
TOP COMMODITIES BY DIRECTION

Top Inbound Commodity Classes		**Top Inbound Outbound Classes**	
STCC 2 Description	**% of Total**	**STCC 2 Description**	**% of Total**
Food and kindred products	21.0	Petroleum or coal products	57.0
Clay, concrete, glass, or stone products	14.8	Food and kindred products	11.3
Lumber or wood products ex. Furniture	9.1	Clay, concrete, glass, or stone products	5.7
Chemicals or allied products	9.1	Chemicals or allied products	4.7
Pulp, paper, or allied products	7.1	Waste or scrap materials	2.3
Top Through Commodity Classes		**Top Internal Commodity Classes**	
STCC 2 Description	**% of Total**	**STCC 2 Description**	**% of Total**
Food and kindred products	18.0	Petroleum or coal products	90.1
Secondary traffic	14.7	Farm products	6.4
Clay, concrete, glass, or stone products	13.9	Secondary traffic	3.4
Primary metal products	9.4	Food and kindred products	0.0
Chemicals or allied products	7.1		

Source: CSI analysis of Transearch 2000

e. Mode Split by Tonnage and Value

Trucks carry by far the greatest amount of freight, by tonnage and value. Trucks carry 76.6 percent of all tonnage and 94.6 percent of all value of goods entering and leaving the Borough. Water is the second greatest mode, comprising 23 percent of total tonnage and 5.2 percent of total value. Rail carries a relatively insignificant 0.4 percent of tonnage and 0.2 percent of value. It should also be noted that while there are no airports in the Borough, air cargo traveling through the Borough accounts for 0.3 percent of the total tonnage and will be discussed in further detail in a subsequent section on air cargo.

TABLE III-6
TONNAGE AND VALUE BY MODE

	Rail	Truck	Water	Total
Total Tonnage	568,686	109,542,517	32,979,004	143,090,208
Percent by Mode	0.40	76.55	23.05	100.00
Total Value*	$837,343,586	$333,921,891,345	$18,269,646,957	$353,028,881,888
Percent by Mode	0.24	94.59	5.18	100.00

Source: CSI analysis of Reebie Transearch 2000 data
** 2000 $s*

The following sections introduce commodity class trends for tonnage and value for the three modes and air cargo drayage. For each mode, the top tonnage and top value commodities are briefly presented and represent the total tonnage for all moves (inbound, outbound, internal, and through) for each mode.

f. Truck Commodities

The top commodity class for all moves (inbound, outbound, internal, and through) by truck is food and kindred products representing 20.8 percent of the total tonnage. The next most important truck commodity classes by tonnage are clay, concrete, glass or stone products; and petroleum or coal products representing 13.6 percent and 12.5 percent of the total tonnage, respectively. Following food, stone, and petroleum classes are chemicals and allied products at 7.9 percent and secondary traffic at 7.0 percent. Other high tonnage commodity classes include paper products, metal products, and machinery. The following table shows the top twenty truck commodity classes by total tonnage. The highest value truck commodity class is machinery, representing 13.3 percent of the total value of goods moved by truck. The next most valuable commodity classes are apparel and related products at 12.6 percent and electrical equipment at 11.2 percent of the total value of truck shipments. Other high value truck commodity classes include transportation equipment and food and kindred products representing 11.2 percent and 9.7 percent, respectively, of the total value of goods moved by truck.

TABLE III-7
TOP TRUCK TONNAGE COMMODITIES

STCC 2 Description	Total Tonnage	% of total
Food or kindred products	22,821,776	20.8
Clay, concrete, glass or stone products	14,858,694	13.6
Petroleum or coal products	13,682,002	12.5
Chemicals or allied products	8,688,719	7.9
Secondary traffic	7,626,084	7.0
Lumber or wood products	7,080,414	6.5
Pulp, paper, or allied products	5,842,595	5.3
Primary metal products	4,871,212	4.4
Fabricated metal products	4,285,965	3.9
Transportation equipment	2,633,835	2.4
Rubber or misc. plastics	2,400,822	2.2
Machinery	2,137,592	2.0
Printed matter	2,130,147	1.9
Furniture or fixtures	1,808,490	1.7
Apparel or related products	1,717,517	1.6
Electrical equipment	1,666,541	1.5
Farm products	1,586,133	1.4
Textile mill products	1,067,333	1.0
Misc. manufacturing products	939,885	0.9
Leather or leather products	586,760	0.5

Source: CSI analysis of Reebie Transearch 2000 data

TABLE III-8
TOP TRUCK VALUE COMMODITIES

STCC 2 Description	Total Value (2000 $s)	% of total
Machinery	44,359,867,242.65	13.3
Apparel or related products	42,019,954,116.83	12.6
Electrical equipment	37,541,135,144.35	11.2
Transportation equipment	32,408,880,614.09	9.7
Food or kindred products	29,245,655,037.87	8.8
Leather or leather products	18,065,172,462.21	5.4
Instrum., photo equip., optical equip.	15,946,113,965.30	4.8
Lumber or wood products	15,229,427,736.90	4.6
Rubber or misc. plastics	13,659,509,050.62	4.1
Fabricated metal products	12,783,705,591.90	3.8
Chemicals or allied products	12,583,235,573.44	3.8
Misc. manuf. Products	10,268,865,211.61	3.1
Furniture or fixtures	9,440,445,186.31	2.8
Secondary traffic	7,810,000,796.34	2.3
Pulp, paper or allied products	7,350,885,802.70	2.2
Textile mill products	6,490,213,615.06	1.9
Printed matter	4,790,840,747.03	1.4
Primary metal products	3,963,276,233.29	1.2
Petroleum or coal products	3,294,329,098.57	1.0
Clay, concrete, glass or stone products	2,658,872,258.93	0.8

Source: CSI analysis of Reebie Transearch 2000 data

g. Water Commodities

The commodity class petroleum or coal products accounts for most of the total tonnage of goods moved by water. This class represents 87.8 percent of all waterborne freight tonnage. Compared to the petroleum or coal class, tonnage totals from other freight categories are relatively small. Other classes (and their shares in parenthesis) that comprise the majority of total tonnage are waste or scrap metals (3.9 percent); chemicals or allied products (2.7 percent); miscellaneous freight shipments (2.0 percent); and crude petroleum, natural gas, or gasoline (1.9 percent). Thus, petroleum or coal products and the other four listed commodity classes account for more that 98 percent of the total tonnage of waterborne goods moved. The following table (Table III-9) shows the dominance of petroleum or coal products among other waterborne commodity classes.

The highest value waterborne commodity class is petroleum or coal products, representing over $7.6 billion dollars in 2000. However, despite its high share of total tonnage, the petroleum or coal products commodity class represents only 41.7 percent of the total value of 2000 waterborne freight. That class is followed by miscellaneous freight shipments (18.7 percent); machinery (10.9 percent); chemicals or allied products (8.7 percent); and apparel or related products, representing 7.9 percent of the total value. The following table shows the value ranking of waterborne commodity classes.

TABLE III-9
TOP WATER TONNAGE COMMODITIES

STCC 2 Description	Total Tonnage	% of total
Petroleum or coal products	28,964,973	87.8
Waste or scrap materials	1,285,175	3.9
Chemicals or allied products	906,283	2.7
Miscellaneous freight shipments	655,338	2.0
Crude petroleum, natural gas or gasoline	638,817	1.9
Clay, concrete, glass, or stone products	98,329	0.3
Pulp, paper, or allied products	95,984	0.3
Transportation equipment	87,037	0.3
Machinery, ex. Electrical equip.	82,388	0.2
Farm products	59,858	0.2
Apparel or related products	51,043	0.2
Printed matter	19,215	0.1
Electrical machinery, equip. or supplies	13,063	< 0.1
Rubber or misc. plastic products	10,825	< 0.1
Food or kindred products	10,157	< 0.1

Source: CSI analysis of Reebie Transearch 2000 data

TABLE III-10
TOP WATER VALUE COMMODITIES

STCC 2 Description	Total Tonnage ($)	% of total
Petroleum or coal products	7,612,332,817	41.7
Misc. freight shipments	3,425,525,769	18.7
Machinery	1,987,462,716	10.9
Chemicals or allied products	1,597,172,053	8.7
Apparel or related products	1,441,480,201	7.9
Transportation equipment	1,328,164,581	7.3
Electrical equipment	411,804,283	2.3
Pulp, paper or allied products	140,430,582	0.8
Rubber or misc. plastics	86,611,537	0.5
Farm products	75,336,574	0.4
Printed matter	64,397,489	0.4
Waste or scrap materials	36,487,983	0.2
Crude petroleum or natural gas	31,339,614	0.2
Clay, concrete, glass or stone products	22,098,439	0.1
Food or kindred products	5,873,777	< 0.1

Source: CSI analysis of Reebie Transearch 2000 data

h. Rail Commodities

The highest tonnage rail commodity class is pulp, paper or allied products, comprising 31.9 percent of the total value of goods moved inbound or outbound by rail. Following the pulp and paper class, the next highest tonnage classes are waste or scrap materials at 17.6 percent and chemicals or allied products at 12.6 percent of the total rail tonnage. Following these categories, rail is also an important transportation mode for lumber and wood products; food products; and clay, concrete, glass or stone products. The following table lists the top twenty commodity classes by tonnage for inbound and outbound rail movements in Brooklyn.

The highest value commodity class for rail freight is pulp, paper or allied products, representing 32.7 percent of the total value of goods moved by rail inbound and outbound in Brooklyn. The next most important commodity classes are transportation equipment (18.8 percent); chemicals or allied products (15.6 percent); and lumber or wood products (13.2 percent). Food products, metal products, and farm products are also important high-value commodities moved by rail in the Borough. The table below presents the top twenty commodities by value moved by rail.

TABLE III-11
TOP RAIL TONNAGE COMMODITIES

STCC 2 Description	Total Tonnage	% of total
Pulp, paper or allied products	186,953	31.9
Waste or scrap materials	103,063	17.6
Chemicals or allied products	74,112	12.6
Lumber or wood products	42,576	7.3
Food or kindred products	41,423	7.1
Crude petroleum or natural gas	38,398	6.5
Clay, concrete, glass or stone products	33,806	5.8
Farm products	16,095	2.7
Primary metal products	14,867	2.5
Transportation equipment	10,295	1.8
Petroleum or coal products	3,065	0.5
Nonmetallic minerals	1,320	0.2
Furniture or fixtures	500	0.1
Tobacco products	489	0.1
Apparel or related products	309	0.1
Machinery	300	0.1
Fabricated metal products	292	< 0.1
Rubber or misc. plastics	283	< 0.1
Misc. manufacturing products	209	< 0.1

Source: CSI analysis of Reebie Transearch 2000 data

TABLE III-12
TOP RAIL VALUE COMMODITIES

STCC 2 Description	Total Tonnage ($)	% of total
Pulp, paper or allied products	273,523,613.21	32.7
Transportation equipment	157,099,329.71	18.8
Chemicals or allied products	130,610,344.23	15.6
Lumber or wood products	110,432,388.56	13.2
Food or kindred products	64,028,189.27	7.6
Primary metal products	20,767,720.50	2.5
Farm products	20,257,103.22	2.4
Tobacco products	17,500,917.95	2.1
Apparel or related products	8,712,196.42	1.0
Clay, concrete, stone or glass products	7,597,598.44	0.9
Machinery	7,224,900.27	0.9
Instrum., photo equip., optical equip.	3,903,337.53	0.5
Furniture or fixtures	2,998,694.55	0.4
Waste or scrap materials	2,926,102.42	0.3
Misc. manufacturing products	2,582,603.70	0.3
Rubber or misc. plastics	2,262,701.39	0.3
Crude petroleum or natural gas	1,293,127.23	0.2
Fabricated metal products	1,134,466.64	0.1
Petroleum or coal products	805,491.48	0.1

Source: CSI analysis of Reebie Transearch 2000 data

i. Air Cargo Truck Drayage

An important share of through truck movement is related to the transportation of air cargo to and from JFKIA in Queens, New York through Brooklyn. While the Transearch database does not reveal the specific types of goods transported as air cargo drayage through the Borough, it does estimate the tonnage of those movements. The Transearch database for 2000 shows that air freight drayage accounts for 324,957 annual tons of through movement representing 0.58 percent of all through truck tonnage; 0.30 percent of total truck tonnage (inbound, outbound, internal, and through); and approximately 0.23 percent of all tonnage for all directions and modes. Using the average cost per ton of air freight drayage from the Transearch database, the estimated value of air cargo moving through Brooklyn by truck is $572,682,304, or 1.5 percent of the value of all goods moving through the Borough. While the Transearch database does not break down air cargo drayage into specific commodities, recent data from the PANYNJ categorizes air cargo commodities shipped through JFKIA. Some portion of these commodities moves through the Borough. The highest tonnage commodity classes are machinery, including electrical machinery; apparel; optical and medical instruments; plastic products; fish and seafood; printed matter (books, newspapers etc.); footwear; vegetables; and pharmaceutical products.[11]

j. Trade Patterns

This and following sections introduce the regional, national, and international trade patterns of goods moving inbound, outbound, and through Brooklyn using the pre-defined regions presented in section C.1.a on commodity flow methodology. This portion of the analysis first presents Brooklyn's top trading partner regions, or those regions with the highest total tonnage of freight moving both inbound and outbound to and from the Borough. Next, the individual inbound and outbound patterns are discussed. A subsequent section presents the top through trip generating pairs of regions.

The data show that Brooklyn's top trading partner, in terms of total trade tonnage (inbound and outbound) is Northern New York State. Tonnage between Brooklyn and Northern New York State represents 16.3 percent of all trade tonnage. The next most important trading region with Brooklyn is the U.S. Midwest, with 7.5 percent of all trade tonnage. Other important trading partners include the Southern Tier of New York State; New York County (Manhattan); Eastern Connecticut and Rhode Island; and the Southeastern United States. International trade with North American Free Trade Agreement (NAFTA) partners Canada and Mexico accounts for approximately 2.8 percent of the total inbound and outbound tonnage linked to Brooklyn. The Borough's most important international trade partner region is Ontario, Canada, representing over half (54 percent) of Brooklyn's international trade. Other important international partners are Quebec, Canada, and Mexico, representing approximately 29 percent and 7 percent, respectively of international trade with Brooklyn.

---

11 *International Air Cargo Statistics Review: New York Customs District, January – August 2002.* Prepared by The Aviation Department of the Port Authority of New York & New Jersey. September 2002.

TABLE III-13
TOP 25 TRADING PARTNERS

Trading Partner	Tonnage	% of Total	Rail Share	Truck Share	Water Share
Northern New York State	19,537,136	16.3	0	15,124,213	4,412,923
Midwest	9,035,930	7.5	89,789	8,930,995	15,146
Southern Tier	7,704,246	6.4	9,916	7,693,404	926
New York County	7,169,162	6.0	0	1,821,265	5,347,897
Eastern Connecticut and Rhode Island	5,258,906	4.4	0	3,609,254	1,649,652
Southeast	5,171,592	4.3	0	4,892,290	279,302
Massachusetts	5,076,589	4.2	0	2,521,157	2,555,432
Delaware Valley - NJ	4,659,908	3.9	0	2,686,080	1,973,828
Mid Atlantic	4,386,396	3.7	22,374	3,679,097	684,925
Hudson County	4,278,100	3.6	0	650,538	3,627,562
Bergen County	3,733,157	3.1	0	3,733,157	0
Northern New England	3,474,422	2.9	0	2,096,786	1,377,636
Essex County	3,456,016	2.9	3,958	478,122	2,973,936
New Haven County	3,448,521	2.9	0	232,816	3,215,705
Delaware Valley - PA	2,942,578	2.4	0	2,343,869	598,709
Suffolk County	2,661,957	2.2	0	2,253,703	408,254
Queens County	2,529,981	2.1	0	2,186,258	343,723
Eastern Pennsylvania	2,391,868	2.0	18,129	2,373,739	0
California	2,211,577	1.8	2,954	2,198,868	9,755
Nassau County	2,031,140	1.7	0	1,810,185	220,955
Western Pennsylvania	2,010,672	1.7	13,422	1,936,451	60,799
Middlesex County	1,981,562	1.6	0	705,996	1,275,566
Westchester County	1,936,143	1.6	0	1,853,708	82,435
Ontario	1,827,555	1.5	157,078	1,670,477	0
Southwest	1,673,181	1.4	9,955	1,366,311	296,915

Source: CSI analysis of Reebie Transearch 2000 data

It should be acknowledged that because geographies (population and land area) of these regions are not uniform, it is difficult to discern the relative importance of some smaller regions when compared to all national regions. Many national regions, like the Midwest, encompass many states with much more land area and larger markets than other regions, including the individual county regions of the New York City metropolitan area. To help clarify how smaller regions, such as the individual metropolitan counties, interact with Brooklyn as trading partners, the following table shows regional counties ranked according to total tonnage traded with Brooklyn. The following table is different from the previous table showing trading partners in that it excludes regions outside the NYMTC region and the percentage of total tonnage (percent of region) is calculated using a regional total of all tonnage with an inbound or outbound linkage to Brooklyn instead of the national/international total. Some analysis of local trading partners is important because collectively, regional counties account for 33.1 percent of the total inbound and outbound tonnage to and from Brooklyn and therefore represent a single trading block larger than any other multi-county or multi-state region in the analysis.

TABLE III-14
TOP 15 REGIONAL TRADING PARTNERS

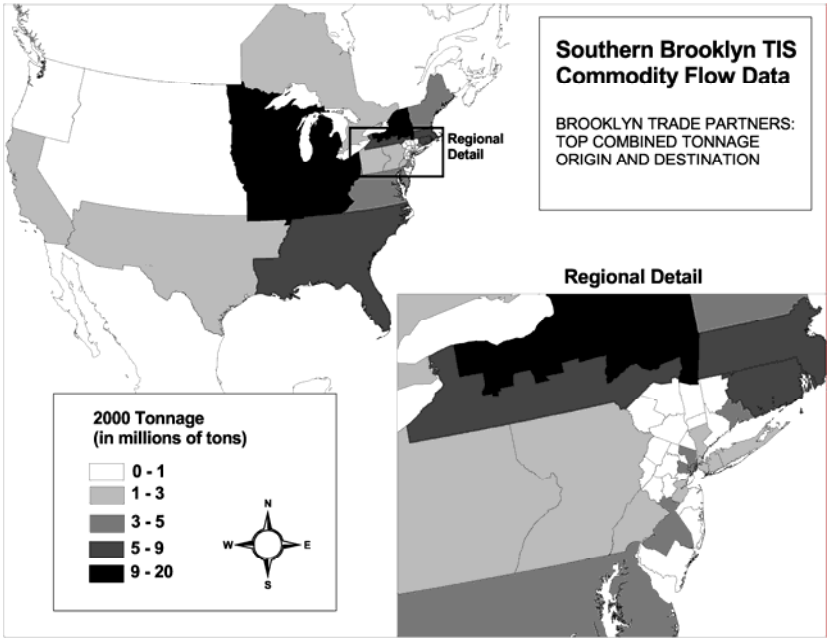
Trading Partner	Tonnage	% of Region	Rail Share	Truck Share	Water Share
New York County (NY)	7,169,162	18.2	-	1,821,265	5,347,897
Hudson County (NJ)	4,278,100	10.9	-	650,538	3,627,562
Bergen County (NJ)	3,733,157	9.5	-	3,733,157	-
Essex County (NJ)	3,456,016	8.8	3,958	478,122	2,973,936
New Haven County (CT)	3,448,521	8.8	-	232,816	3,215,705
Suffolk County (NY)	2,661,957	6.8	-	2,253,703	408,254
Queens County (NY)	2,529,981	6.4	-	2,186,258	343,723
Nassau County (NY)	2,031,140	5.2	-	1,810,185	220,955
Middlesex County (NJ)	1,981,562	5.0	-	705,996	1,275,566
Westchester County (NY)	1,936,143	4.9	-	1,853,708	82,435
Bronx County (NY)	1,405,945	3.6	-	1,223,859	182,086
Rockland County (NY)	927,548	2.4	-	927,548	-
Union County (NJ)	616,524	1.6	-	616,524	-
Fairfield County (CT)	558,405	1.4	-	378,407	179,998

Source: CSI analysis of Reebie Transearch 2000 data

The table shows that Manhattan (New York County) is the single greatest local trading partner with Brooklyn. Goods exchange between the two counties represents 18 percent of the regional inbound and outbound tonnage. The New Jersey Counties of Hudson, Bergen, and Essex are the next three largest trading partners with Brooklyn.

Finally, the following map graphically illustrates the top trade partner regions in North America and in the greater New York City region.

FIGURE III-7
BROOKLYN TRADE PARTNERS: TOP COMBINED TONNAGE ORIGIN AND DESTINATION



k. Origin and Destination Regions

When examined individually, origin and destination data reveal trends similar to those revealed from the analysis of overall trade partners. In the case of inbound freight, the top origin region for inbound freight to Brooklyn is Northern New York State, accounting for over 17 percent of the total inbound tonnage. The next most important origin regions are the Midwest U.S. and the Southern Tier of New York State representing 12 percent and 10 percent, respectively, of the total inbound tonnage. Other important origin regions are the Southeast states, the Mid Atlantic states and Eastern Pennsylvania. Regional counties, while individually less significant than the aforementioned larger geographic regions, collectively account for over 23 percent of the total inbound tonnage. The greatest single county origins of inbound tonnage are Hudson County, New Jersey with 3 percent of the total inbound tonnage, and Queens, Westchester, and Suffolk counties with 2 percent each of the total inbound tonnage. The following table organizes trade regions by inbound and outbound tonnage totals.

TABLE III-15
TOP ORIGINS AND DESTINATION REGIONS

Rank	Origin Region	% of Inbound	Rank	Destination Region	% of Outbound
1	Northern New York State	17	1	Northern New York State	15.3
2	Midwest	12	2	New York County	9.9
3	Southern Tier	10	3	Eastern Connecticut and Rhode Island	7.6
4	Southeast	7	4	Massachusetts	6.9
5	Mid Atlantic	6	5	Delaware Valley - NJ	5.4
6	Eastern Pennsylvania	4	6	New Haven County	5.2
7	Hudson County	3	7	Essex County	4.8
8	California	3	8	Bergen County	4.5
9	Western Pennsylvania	2	9	Hudson County	4.3
10	Southwest	2	10	Southern Tier	3.7
11	Queens County	2	11	Midwest	3.6
12	Westchester County	2	12	Northern New England	3.6
13	Suffolk County	2	13	Delaware Valley - PA	2.8
14	Delaware Valley - NJ	2	14	Suffolk County	2.2
15	Northern New England	2	15	Queens County	2.0
16	Delaware Valley - PA	2	16	Middlesex County	1.9
17	Ontario	2	17	Mid Atlantic	1.8
18	Nassau County	2	18	Nassau County	1.7
19	New York County	1	19	Southeast	1.7
20	Bergen County	1	20	Bronx County	1.4
21	Quebec	1	21	California	1.2
22	Middlesex County	1	22	Ontario	1.2
23	Rockland County	1	23	Westchester County	1.0
24	Massachusetts	1	24	Western Pennsylvania	1.0
25	Bronx County	1	25	Eastern Pennsylvania	0.6

Source: CSI analysis of Reebie Transearch 2000 data

For outbound freight originating in Brooklyn, Northern New York State is the single greatest destination region, attracting 15.3 percent of total outbound tonnage. Manhattan (New York County) is the second greatest recipient of Brooklyn freight, drawing 9.9

percent of the total tonnage. The Eastern Connecticut and Rhode Island region follows with 7.6 percent of the total outbound tonnage. Other leading destinations of Brooklyn freight are Massachusetts and the Delaware Valley region of New Jersey, drawing 6.9 percent and 5.4 percent of the total outbound tonnage, respectively. The single greatest county origin is New Haven County, Connecticut representing 5.2 percent of outbound freight tonnage. Regional counties tend to receive a larger share of outbound tonnage from Brooklyn than they send into the Borough. Taken collectively, regional counties receive 42 percent of the total outbound tonnage. Thus, on a regional level, Brooklyn sends more freight to local counties than it receives from local counties.

I. Through Trip Origin and Destination Pairs

Through tonnage for Brooklyn from the Transearch database is limited only to truck traffic. The following table shows the top 25 pairs of origins and destinations that generate truck traffic through the Borough. Through moves are based on the routing assignments of the Transearch model and are most accurate at a national level. At the regional or city level, the accuracy of routing assignments may decrease because specific and complex intra-city routing decisions may be precluded from the model. In the case of through moves with origins or destinations in Queens or other Long Island jurisdictions, the Transearch data tends to assume that a higher proportion of westbound traffic travels through Brooklyn than may actually be the case. Thus, the following table might be interpreted in light of potential routing deficiencies. With this in mind, the highest tonnage pair of regions is Queens County and the Southern Tier of New York State, with 6.6 percent of the total tonnage. Other important through trip pairs include Queens County and the Southern Tier (4.8 percent); the Southeast U.S. and Suffolk County (4.8 percent); Northern New York State and Queens (4.5 percent); and the Mid Atlantic U.S and Suffolk County (4.3 percent). In light of the potential routing deficiencies, the most important through trip pairs may be those where there is a high probability that trucks will travel over the Verrazano-Narrows Bridge en route to/from an origin or destination region to the west or southwest of Long Island. Conversely, less weight might be given to those trip pairs where there is a high probability that a truck would travel from Long Island (including Brooklyn and Queens) to/from an origin or destination to the north or northeast.

TABLE III-16
TOP 25 THROUGH TRUCK ORIGIN/DESTINATION PAIRS

Origin Region	Destination Region	Truck Tonnage	% of Through
Southern Tier	Queens County	1,432,350	6.6
Queens County	Southern Tier	1,047,168	4.8
Southeast	Suffolk County	1,033,678	4.8
Northern New York State	Queens County	974,760	4.5
Mid Atlantic	Suffolk County	932,556	4.3
Queens County	Northern New York State	895,994	4.1
Southeast	Nassau County	751,524	3.5
Mid Atlantic	Nassau County	669,298	3.1
Midwest	Queens County	624,751	2.9
Southeast	Queens County	622,885	2.9
Mid Atlantic	Queens County	619,811	2.9

TABLE III-16 (CONTINUED)
TOP 25 THROUGH TRUCK ORIGIN/DESTINATION PAIRS

Origin Region	Destination Region	Truck Tonnage	% of Through
Queens County	Midwest	563,410	2.6
Suffolk County	Southeast	467,677	2.2
Nassau County	Southeast	371,252	1.7
Queens County	Southeast	341,138	1.6
Suffolk County	Delaware Valley - PA	320,262	1.5
Southwest	Suffolk County	310,022	1.4
Queens County	Delaware Valley - PA	305,490	1.4
Eastern Pennsylvania	Queens County	292,190	1.3
Suffolk County	Mid Atlantic	283,479	1.3
Southwest	Nassau County	283,410	1.3
Nassau County	Midwest	275,987	1.3
Delaware Valley - NJ	Suffolk County	273,236	1.3
Midwest	Suffolk County	270,660	1.2
Suffolk County	Midwest	262,424	1.2

Source: CSI analysis of Reebie Transearch data 2000.

2. NYMTC Best Practices Model Data for Trucks

In order to describe truck movements in greater detail than that permitted by the Transearch commodity regions, this study created a truck trip and tonnage table for Southern Brooklyn from the NYMTC Best Practices Model. Specifically, the trip table contains several fields of data for 250 traffic analysis zones (TAZ) that fall within the study area boundaries. The data fields include daily estimates from the model for the number of truck and auto trips originating and terminating in each TAZ and the tonnage originating and terminating in each TAZ. Additional fields have been calculated to show the percentage of truck trips for each TAZ and the total tonnage (combined origin and destination) for each TAZ. The data have been linked to a GIS map showing the TAZs in the study area to depict the locations of freight activity within Southern Brooklyn. The following two maps show the percentage of truck trips by TAZ and the total tonnage by TAZ. Both maps show truck routes in relation to freight activity.

Figure III-8 shows the TAZs within the study area with the highest percentage of truck trips. The TAZ with the highest percentage of trucks is the zone containing the Brooklyn Developmental Center near the intersection of Fountain Avenue and Flatlands Avenue. The Best Practices Model estimates that over fifteen percent of all trips to and from that TAZ are by truck. Other TAZs with a high percentage of trucks include the TAZ encompassing the Brooklyn Terminal Market (12 percent truck traffic) and the TAZ surrounding the intersection of Cropsey Avenue and Neptune Avenue containing the MTA Coney Island Subway Shops and Yard (11 percent truck traffic).

Figure III-9 shows the TAZs with the highest total tonnage (incoming and outgoing). The TAZ with the single highest tonnage encompasses the Floyd Bennett Field U.S. Coast Guard facility and the Kings Plaza Shopping Center in the vicinity of Flatbush Avenue and the Belt Parkway. The total estimated daily tonnage for that TAZ is over 1,500 tons. Other high-tonnage TAZs include the zone north of the Pennsylvania

Avenue/Belt Parkway interchange and the zone containing Fort Hamilton near the Verrazano-Narrows Bridge with approximately 1,050 and 550 daily tons, respectively.

FIGURE III-8
PERCENT TRUCK TRIPS COMBINED ORIGIN AND DESTINATION

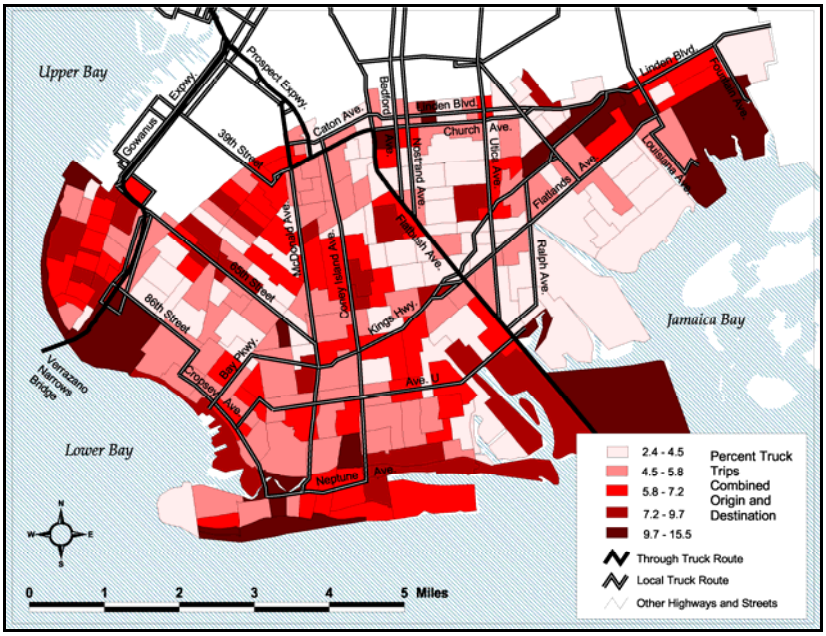


FIGURE III-9
TOTAL TONNAGE BY TAZ COMBINED ORIGIN AND DESTINATION

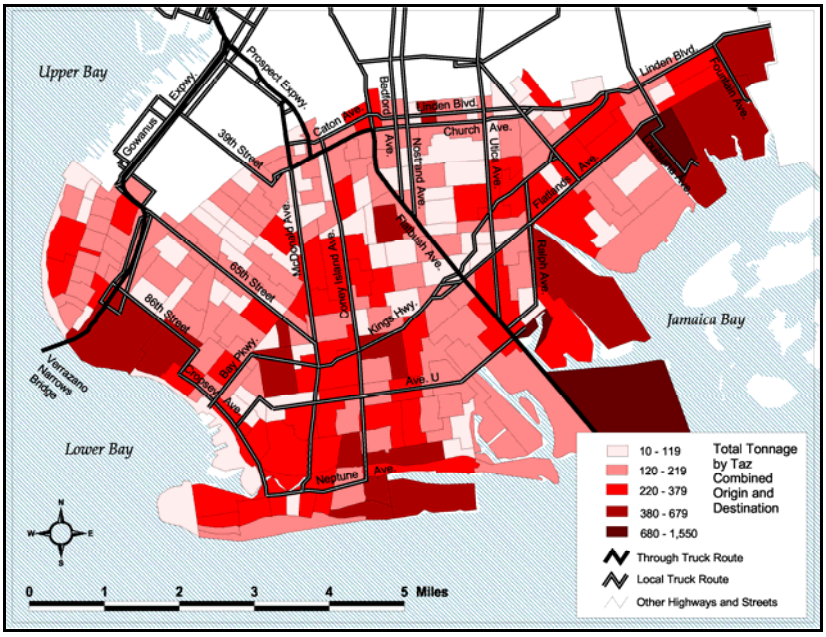
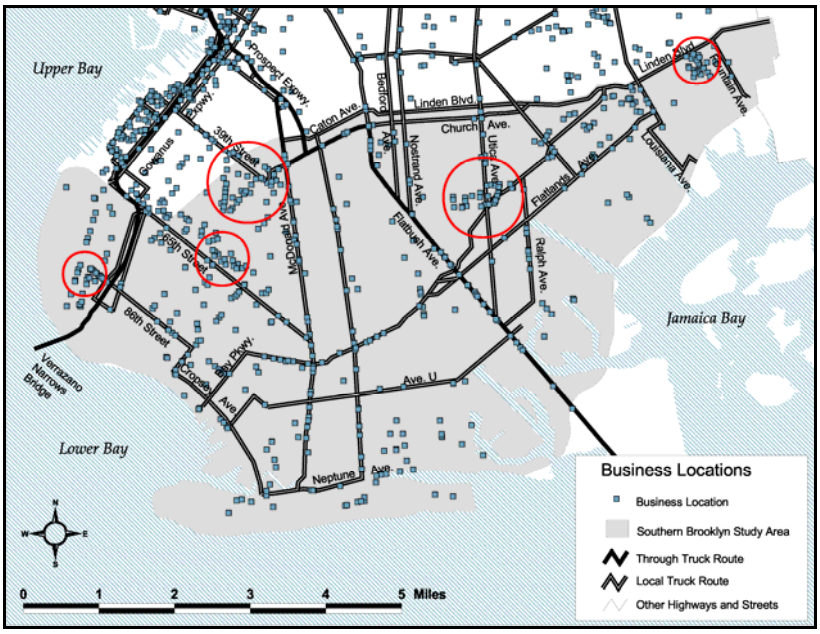


FIGURE III-10
BUSINESS LOCATIONS



3. Freight Generators

In order to identify the locations of freight users and generate a list of potential interviewees, the study team utilized a business directory database called InfoUSA to assemble local business names and industry information. The national InfoUSA database contains nearly 12 million businesses and is one of the most comprehensive sets of current business data available. For this study, InfoUSA queried its database for retail, manufacturing, transportation, and warehousing businesses in Brooklyn with 20 or more employees. The search criteria were designed with the intent of capturing freight-generating businesses in the Borough. The search resulted in 1,881 business listings for Brooklyn. Figure III-10 shows the locations of those businesses in relation to the study area. Important clusters of businesses are circled.

From a demand perspective, the spatial pattern of businesses in the study area shows the potential level of freight activity through Southern Brooklyn. Some locations where there is a clustering pattern of freight-related businesses might be considered freight 'hot spots' or high activity centers.

D. SYSTEM ASSESSMENT

This section summarizes issues and constraints identified by users of the transportation system in the study area. The issues, constraints, and problems listed herein relate specifically to the movement of freight within and through the study area and represent a summary of subjective data collected for the goods movement component of the study. Sources of information and observations in this section include public outreach meetings,

surveys, focus meeting, interviews and field observations conducted for this and other related studies.

1. Summary of Public Outreach Findings Related to Goods Movement

Public outreach efforts for the study have included a series of public meetings and focus groups during 2002 at various locations in the study area. From these meetings and from the study's website, hundreds of comments have been collected from public participants. These included important comments made concerning freight movement in the study area. Concerns with freight movement were both general—such as policy recommendations affecting the entire borough—and specific, such as a problem with excessive truck traffic on a particular street.

a. Truck Access Issues

Public participants identified several system deficiencies related to truck access. For example, one participant said that there is a lack of direct routes to major markets in the study area, like Brooklyn Terminal Market. Another participant said that there is poor truck access to the Red Hook Terminal.

b. Truck Clearance Signage Issues

One participant identified a lack of truck clearance signage on the east-west streets approaching the Brighton Beach (Q) elevated MTA Line along East 15th Street. Other locations where truck clearance signage is lacking are at the intersections of Rockaway and Livonia Avenues and Kings Highway and Ocean Avenues.

c. Truck Rules Enforcement Issues

Several participants identified deficiencies in truck rules enforcement. Complaints include lack of enforcement of overnight truck parking, trucks on non-truck routes, double-parking, and speeding.

d. Environmental and Safety Issues

Participants commented that trucks are negatively impacting air quality and quality of life where truck traffic is concentrated. Another participant commented that trucks are endangering children and senior pedestrians in their neighborhood.

e. Traffic Congestion Issues

In various locations in the study area, participants identified traffic congestion problems caused by ingress, egress, and queuing of commercial vehicles. Participants said that double and triple parking of personal vehicles and trucks has become "unbearable in commercial areas" and makes it difficult for traffic to move through the streets. Avenue J was mentioned as a problem location for truck double-parking. Trucks were also cited as the source of significant new congestion in Southern Brooklyn, especially as trucks travel through residential areas.

f. Improvement Suggestions

Suggestions for improvement ranged from changes in signage and truck routes to construction of freight tunnels. Recommendations included using the Bay Ridge Branch to carry trucks on rail cars; construction of rail tunnels from Brooklyn to New Jersey;

using MTA rail lines to deliver freight between Brooklyn and Manhattan at night; rebuilding the Gowanus Expressway below grade; increasing the capacity of the Belt Parkway; adding turn lanes on Coney Island Avenue; and improving/expanding the maritime freight infrastructure.

2. Summary of Findings from Other Studies

The following subsections present findings from other studies that relate to the SBTIS. The emphasis of the following subsections is to present findings from outreach activities of other studies. However, some non-outreach findings are presented.

a. Brooklyn Input from NYMTC's Truck Terminals and Warehouse Survey Results

In February of 2001, the New York Metropolitan Council completed its *Truck Terminals and Warehouse Survey Results* document for the metropolitan region. The final document contains an inventory of trucking and warehousing facilities and results from a survey of transportation and warehousing businesses to determine, among other things, highway and regulatory problems that limit goods movement. During the course of the study, 14 Brooklyn-based transportation and warehousing businesses were surveyed.

Transportation and warehousing business participants identified several types of issues affecting freight movement in the Borough. All but one of the respondents cited traffic congestion as a primary transportation problem in the Borough, especially on the Gowanus Expressway and the Brooklyn-Queens Expressway. Half of those businesses surveyed said construction and road repairs caused transportation problems for their businesses. Six cited road conditions, including cobblestones, potholes, and a general lack of maintenance as problematic. Several other respondents cited physical size constraints, including narrow streets and insufficient clearance (especially in the Midtown, Lincoln and Holland Tunnels). Other respondents cited regulatory constraints as problematic, including weight restrictions on the bridges (Williamsburg, Manhattan, and 59th Street). Others cited traffic lights, too many lane merges and forks. Others cited problems of safety and enforcement as transportation problems, including traffic accidents; excessive police ticketing during delivery stops; lack of enforcement of parking (especially double-parking); stopping truckers on major highways; and the "unnecessary" requirement that legal counsel represent corporations for minor summons and the excessive fees associated with the attorneys. Also, one company complained that tolls were too high in New York City.

The survey respondents were also asked to provide improvement suggestions for transportation of goods. Those suggestions included the need for larger receiving (unloading) zones and for better enforcement to keep cars clear of loading/unloading areas. Another respondent suggested that an information system should be employed to allow trucks to find alternate routes for deliveries in case of a local blockage. A participant recommended measures to reduce delay due to construction and accidents. Another respondent said the DOT regulations on truck size and weight need to be updated and that when trucks are stopped by DOT and pass inspection they should be given a sticker valid for four to six months to prevent being stopped the following day. Another participant recommended construction projects be completed in a faster time

period and at night (especially on main thoroughfares); not during rush hour. Another respondent said the geometry of street intersections should be improved to facilitate truck turning and one respondent suggested widening major highways. Economic suggestions included the use of congestion pricing programs to induce travel with reduced tolls for off-peak hours. Other suggestions urge police to help keep delivery areas clean and accessible (not blocked by other cars) and for police to ticket cars that are disregarding traffic rules (double-parking and blocking). Another respondent suggested creating a truck route (freightway) in Brooklyn where passenger cars are not allowed at certain hours. Another respondent said the police attitude against truck drivers should be improved. Also, the law should be changed so that corporations can represent themselves for minor summons.

b. NYMTC Regional Freight Plan

The Regional Freight Plan (RFP) also lists a number of issues related to the Gowanus Expressway through Brooklyn that are worthy of mention in the context of Southern Brooklyn. Some issues originate from outreach activities. Those issues include:

- Chronic congestion and poor levels of service;
- There is discontinuity in the number of lanes at interchanges with the Shore Parkway, Prospect Expressway, and Brooklyn-Queens Expressway;
- Numerous heavy weaving sections: westbound from Brooklyn-Queens Expressway to Gowanus Expressway versus from Brooklyn-Battery Tunnel to the Prospect Expressway; westbound from Gowanus mainline to westbound Shore Parkway versus continuing Gowanus mainline; westbound from Shore Parkway to 38th Street exit versus westbound from Gowanus to Gowanus mainline;
- There are non-standard acceleration and deceleration lanes;
- The lack of usable shoulders contributes to excess delays when an incident occurs;
- The expressway has 4.0” mountable curbs adjacent to the travel way, which do not meet current NYSDOT and Interstate standards;
- There is no westbound entrance ramp from the South Brooklyn Marine Terminal area, causing trucks to use local roadways and to use the same ramps [to gain access to the entire waterfront];
- There are only a few exit points off the Gowanus Expressway, leading to traffic congestion at these critical points;
- The City regulations on truck dimensions impact the types of trucks that access the Brooklyn ports;
- A survey of trucking companies has found that 87 percent of trucks using the Gowanus Expressway are arriving between 5:00 a.m. and 3:00 p.m., with just over half of that amount arriving between 10:00 a.m. and 3:00 p.m.; and,
- The survey also concluded that trucking companies are considering relocating out the Brooklyn region to New Jersey if the congestion problem on the Gowanus Expressway is not alleviated.

c. Brooklyn and Goods Movement Input from NYMTC Regional Freight Plan Focus Group

As part of its continuing public outreach effort for the Regional Freight Plan, NYMTC organized a small, professionally moderated focus group of three freight stakeholders.

Three individuals participated in the focus group representing 3 businesses operating in the New York City region. The first individual is the owner of a Brooklyn-based moving company specializing in residential moves and other for-hire moves using 24 and 32-foot trucks. The second participant is president of an importing business specializing in fresh fruit from South America, Israel, Spain, Italy, and Australia. The third individual is the freight manager for a large automobile dealer specializing in European imports.

The focus group participants described several important issues regarding goods movement in the region. First, they related concerns with delay by U.S. Customs in clearing freight and police checkpoints into Manhattan. All three participants said there is no viable alternative to trucking in the New York City area. Rail is troubled by poor infrastructure, inconvenient scheduling, and slow delivery. In terms of regional transportation deficiencies, the group cited I-95 from the George Washington Bridge to the Connecticut State line as the worst facility. The group also emphasized that signage is poor in the New York area for directing trucks through the city. They also said there are poor alternate routes for trucks. Finally, trucks have to travel faster to make up for time lost in congestion and consequently may cause safety problems.

The group, especially the participant from Brooklyn, also related issues specific to the Borough. The group said the greatest problem in Brooklyn is the Brooklyn Queens Expressway because of its high volume of trucks. The participant from Brooklyn said that his business experienced problems because the Prospect Expressway is closed in the morning. This morning closure forces his trucks to use 86th Street to get to Flatbush Avenue. This detour costs his business one hour of delay.

The group also offered a set of suggestions for improving goods movement in the region. One participant suggested building dedicated lanes for trucks and improving the signage in the area. All three said they would be willing to pay double tolls to save time. One participant suggested building a private highway to accommodate traffic in the long-term; in the short-term special arrangements should be made for trucks. Another participants suggested ITS and signage improvements, including CCTV monitoring and that all cleaning and repairs should be scheduled for off-peak hours. Finally, a participant suggested that all shippers and receivers in the region should meet to discuss transportation solutions.

d. PANYNJ Action Plan for Cargo Access to JFK

PANYNJ has provided the study with a "PANYNJ Action Plan for Cargo Access to JFK." While most of the action items in this plan address congestion problems on the Van Wyck Expressway, several of the action items concern Brooklyn and the study area. Those problems related to the study area or Brooklyn are presented in the following table:

TABLE III-17
PANYNJ ACTION PLAN FOR CARGO ACCESS TO JFK

Problem	Project	Benefits
In NYC 53-foot trailers, regardless of the total length of the vehicle, are restricted to only I-95 to the Throggs Neck Bridge to the Clearview Expressway to the Long Island Expressway Eastbound.	Amend current regulation in order to allow 53-foot by 102-inch trailers to access JFK via the Van Wyck.	Allow access to the region's largest air cargo gateway and reduce the need for smaller trucks in greater numbers operating the routes.
Small vehicles such as courier vans with commercial plates are not allowed on the Belt Parkway.	Provide access to the Belt Parkway and the Cross Island Parkway for commercial vans.	Reduce the amount of truck traffic on Van Wyck. Incentive to use smaller trucks. Reduce emissions due to traffic congestion. Provide alternate to Verrazano Bridge and New Jersey.
Atlantic Avenue is an alternative for some trucks transiting Brooklyn however there is a problem with enforcement of the no parking rules on that roadway.	Enforce peak period no parking rules on Atlantic Avenue.	Provide alternate access to LIE and Brooklyn. Reduce emissions due to traffic congestion.
Presently there is no practical access from JFK to the Verrazano Bridge for trucks going south.	Work with regional planning associations to develop an alternative route to access the Verrazano Bridge taking advantage of the work they are doing.	Improve the movement of goods within and through Southern Brooklyn and reduce impacts of through trucks in neighborhoods.

e. New York City Arterial Freight Study

This project, lead by New York State Department of Transportation's Region 11, examines freight activity on the City's major arterials to guide strategic investments in capacity, geometric design, ITS (Intelligent Transportation Systems), and regulations affecting truck freight traffic. To accomplish this, the study team met with several groups of freight stakeholders to obtain comments and suggestions for improvements in mobility and access. The following paragraphs summarize the comments of those groups related to freight arterial needs in the Southern Brooklyn study area.

JFKIA Stakeholders. In April 2000, the Arterial Freight Study team met with freight stakeholders from JFKIA including integrated carriers, freight facility representatives, and facility operators. They reported that getting to and from the airport is their primary transportation problem and that future growth potential in cargo at the airport would not

be realized unless changes are made to the surface transportation infrastructure. The following infrastructure needs and suggestions relate directly to Brooklyn:

- Better accessibility to places in the metropolitan area and beyond (as far away as Chicago and Miami);
- Direct access to the airport from the Verrazano-Narrows Bridge (e.g., across Brooklyn) possibly by using the LIRR right-of-way from Bay Ridge to Linden Boulevard and then onto the Belt Parkway;
- Open the Belt Parkway and other parkways to commercial vans; and,
- Eliminate parking on major city truck routes such as Linden Boulevard.

United Parcel Service. The Arterial Freight study team also met with representatives of the United Parcel Service (UPS) in November 2000. UPS did not provide any specific comments related to Brooklyn infrastructure but gave many operational suggestions related to freight movement in the City. Those suggestions include:

- Increase use of parking lots to remove cars from the streets;
- Issue special permits to freight vehicles to minimize towing and ticketing;
- Develop "special use" arrangements for certain facilities, including the ability for UPS trucks to use the Southern State Parkway to access JFKIA;
- Explore high-speed ferries for goods movement;
- Implement ITS on the arterials to give UPS real-time information about the condition of the roadways and help them make better routing decisions;
- Improve incident management by implementing an advanced incident management system to clear accidents away quickly; and,
- Provide reserved parking locations during high freight activity periods such as Christmas season in front of FAO Schwarz, instead of running multiple trucks throughout the day.

The Arterial Freight Study also summarizes the recommendations from over 42 past studies related to freight in New York City. The following operational recommendations and suggestions related specifically to Brooklyn are taken directly from the study summary. The first set of recommendations is general and operational in nature; the second set is related specifically to infrastructure improvements in Brooklyn.

General operational recommendations from past studies:

- Improve the city's local truck route network to facilitate freight movement and patterns in neighborhoods with easier access to the main truck routes and bridges;
- Provide special, wider EZ-pass toll lanes at the sides of the toll plazas, where physically feasible;
- Provide signage for the truck routes and directions to the through routes so that trucks do not use the local streets;

- Improve the signal timing and traffic controls on all roadways that lead to the entrances of major traffic generators;
- Use ITS technology to manage (by appointment or pricing) commercial parking spaces in the highly congested New York central business district;
- Review and revise the City's parking policies to take advantage of today's metering and enforcement technology;
- Have trucks operate off-peak (e.g., at night);
- Ensure better coordination between the port and land-side improvement projects;
- Review curb regulations in areas of heavy truck activity with a view towards expanding truck loading zones, and creating additional on-street parking for trucks;
- Issue E-Z Passes at the tolled crossings to all commercial vehicles that regularly conduct business in the metropolitan area;
- Use ITS technology to provide drivers with up-to-date information on traffic conditions;
- Increase the use of rail to move freight across the Hudson River;
- Reduce rail freight traffic conflict with busy commuter rail lines; and,
- Provide information systems that facilitate the handling of intermodal traffic.

Specific recommendations for Brooklyn infrastructure or operations improvements:

- Provide a new rail freight yard (65^{th} Street Rail Yard) in Brooklyn, give it access to the Long Island Rail Road and car float connections in New Jersey;
- Allow small commercial vehicles to use the Belt, Cross Island, and Grand Central Parkways during the off-peak periods (10AM – 4PM and 7PM –7AM, Monday – Friday) where feasible;
- Create a new truck route in Brooklyn;
- Use the existing trolley tunnel under the intersection under Ocean Parkway, Prospect Expressway, and NY Route 27, for through traffic;
- Improve the interchanges at Cross Bay Boulevard, Linden Boulevard, Belt Parkway, Conduit Avenue, and Nassau Expressway, including sign and guide rail replacements; and,
- Remove curb parking along sections of Linden Boulevard to facilitate truck movement to and from warehouses adjacent to JFKIA.

Finally, the Arterial Freight Study makes a set of recommendations based on past studies, outreach, and modeling outputs using several alternatives in the NYMTC Best Practices Model. The recommendations from the study are listed below and are divided into two categories: non-capital measures and capital measures.

Non-capital measures:

- The relaxation of restrictions on 53-foot long, 102-inch wide tractor-trailers in New York City on certain routes should be seriously considered to prevent adverse economic impacts at JFKIA and other nationally competitive freight generators in the City;
- A central information clearinghouse should be established to fully inform those wishing to bring a truck into the City, including route, toll, clearance, and other safety and operations information;
- The City should seriously consider allowing commercial vans on the parkways, including the Belt Parkway, to transport high value, low weight goods to and from JFKIA and LaGuardia Airport and to reduce congestion on expressways in Brooklyn and Queens;
- Adding truck ways or special use freight lanes in Brooklyn, Queens, and the lower end of the Bronx should be seriously considered because the results of the modeling show truck ways having a major potential to divert commercial traffic from congested expressways;
- NYSDOT Region 11 should initiate the long planned special use lanes study;
- Additional planning studies that related to truck ways (e.g., in Brooklyn and Queens) should be added to the TIP for funding;
- Extensive diversion of cross-Hudson truck trips to rail should be encouraged along with the use of intermodal facilities;
- Dedicated connections to major freight complexes from the expressway network should be constructed so that trucks do not have to use local city streets;
- Large-scale freight activities should be concentrated in strategic locations like Hunts Point, Maspeth, Harlem River Yard, Fresh Pond, and the Pilgrim (Long Island) site so that high-quality highway facilities can be provided economically to support these operations;
- Regulatory policies regarding truck size and curbside access restrictions should be reviewed and revised;
- Redevelopment plans for lower Manhattan should include goods movement accessibility features and office support services; and,
- The list of truck geometric restrictions in the City should be updated and a program to eliminate or mitigate these restrictions should be initiated.

3. Interview Findings

In order to gain a greater understanding of goods movement issues, especially related to physical and regulatory constraints in the study area, twenty public and private organizations directly involved in freight movement were contacted. The following paragraphs summarize the interviews with these organizations.

a. Port Authority of New York and New Jersey, Aviation Department and the JFK Air Cargo Association

Potential improvements to enhance ground access to the JFKIA area:

- **Highway Improvements.** From the perspective of JFKIA, the optimal outcome [of the study and improvement program] would be a southern corridor roadway that would give JFKIA access to the Verrazano-Narrows Bridge. One possibility that must be considered is use of the Bay Ridge right-of-way, consistent with buffer requirements from FHWA concerning multi-modal uses. Use of the Bay Ridge for trucks could be examined using the NYMTC Best Practices Model. Increased use of Linden Boulevard may be difficult due to neighborhood impact issues. The other possibility that would greatly enhance JFKIA access is the completion of the Clearview Expressway.
- **Rail Improvements.** Standard rail freight is too slow and/or infrequent for the time-sensitive air cargo market, but it may be possible to use high-speed passenger rail to collect and distribute air cargo, particularly in Amtrak's northeast corridor. PANYNY had discussed this possibility with Amtrak but no action was taken. It may be possible to use Amtrak to move cargo to Washington, D.C., Baltimore, Philadelphia, and Boston. Cargo would be trucked to Sunnyside Yard and loaded onto cars in air cargo containers that could easily be loaded and unloaded from baggage cars, without having to detach a rail car at each location.
- **Ferry System Improvements.** The demand exists to move cargo between Newark International Airport and JFKIA because JFKIA is preferred by freight forwarders and offers better Customs clearance time. Thus, some carriers, including Continental, move a lot of cargo between the two airports to take advantage of JFKIA's Customs clearance efficiency. Much of this cargo is international and is arriving or departing from Newark International Airport. Continental, for example, runs 27 truck trips each day between the two airports. Thus, there is possibly demand for a fast freight ferry between New Jersey and JFKIA. UPS and FEDEX could also supply numbers of trips between the two airports to begin to estimate demand. This is becoming increasingly important as the last air cargo facility is being built at JFKIA, and since there is no room for any more air freight facilities. The key to using ferries for cargo transportation is to have ships that are easily convertible from passenger to cargo and vice versa.
- **Near-term Improvements.** Atlantic Avenue was identified as a potentially useful truck route, is already an industrial corridor, and would likely involve fewer community impacts than other options.

General issues relating to current ground access and operations:

- **Peaking Characteristics.** Freight forwarders have to deliver cargo to the carrier at the airport at least three hours before scheduled departure to allow sufficient security clearance and loading time. There are two peaks during a normal business day. The first peak is from 10:00 a.m. to 1:00 p.m. as cargo is delivered and leaves the airport to meet the demands of Asian carriers. These carriers have larger planes and experience fewer problems than the second peak group, the European carriers. The

peak for European carriers occurs between 2:00 p.m. and 8:00 p.m. and is the busiest time for cargo at the airport. Most European flights land and depart during this time period. The European market is the larger of the two markets, with the United Kingdom being the leading transatlantic cargo partner, followed by Germany, France, Italy, and other EU countries.

- **Truck Access Study.** PANYNJ provided the recently completed *JFK Cargo Truck Access Study* and gave the SBTIS team permission to use the study and its underlying data. Results and data from that study are presented in Section C. of this technical memorandum on operational characteristics and demand. As shown in the *JFK Cargo Truck Access Study*, the principal routes for inbound/outbound trucks include a combination of Van Wyck Expressway and the following bridges:

  — To/From New England and points north: Van Wyck Expressway to Throggs Neck Bridge

  — To/From points west: Van Wyck Expressway to Whitestone Expressway to George Washington Bridge

  — To/From points south (I-95 corridor): Van Wyck to BQE to VNB

  The truck access study was not able to account for chained trips. For example, when the survey was conducted, many drivers indicated their destination was a nearby community, such as South Ozone. But in reality, the drivers were merely taking their cargo to an adjacent community to break it down and deliver it to another distant location. Thus, the results showing a share of the cargo with destination or origin in the local airport communities is incomplete.

- **Truck Route Signage.** There are directions for truck drivers to the airport on the official PANYNJ facilities map that take trucks through the center of Brooklyn on a combination of truck routes. The use of these routes by many trucks is unlikely, however, because of congestion and tight turns. There is also a link to the NYCDOT Truck Routes map on the JFK Air Cargo Association website.

- **Increases in Trucking of International Cargo.** International airlines use larger airplanes than domestic airlines and the disparity continues to increase. As the international airplanes grow larger, the domestics are increasingly smaller and therefore cannot accommodate all the international cargo, even when broken down. Thus, the overflow went to trucks and continues to go to trucks because of the size differential and also because trucks do not have to adhere to the security standards domestic airlines do when taking international cargo to a domestic location. For example, when air cargo from an international airline arrives at JFKIA and some of that cargo needs to go to another domestic location there may be little reason to send that cargo by a domestic airline because 1) there may not be capacity for the cargo on the increasingly smaller domestic craft; 2) there may be a limited number of flights or carriers available; and 3) that cargo would have to pass again through security screening after clearing customs. Thus, transloading the cargo from the international flight after customs clearance directly to a truck where there are no capacity, scheduling, or security constraints often becomes the most efficient option.

- **Cargo Composition.** The current outbound to inbound ratio (import to export ratio) is imports = 100 and exports = 65. The primary tonnage commodities are machinery, apparel, optics, and medical instruments. Other commodities, including jewelry and precious stones, are high in value but not tonnage. PANYNJ will make this data on commodities available to the team.
- **Warehousing and Free Trade Zones**. Long-term warehousing and value-added processing is less significant for air cargo because most air cargo is comprised of finished goods being moved on a just-in-time basis. There are some warehouses in local areas, such as Ozone Park, for less-than–truckload[12] (LTL) breakdown.
- **Critical Bottlenecks.** The Kew Gardens Interchange (northbound) is a notorious bottleneck according to truck drivers. The truck drivers have come to accept driving in heavy stop-and-go traffic to access JFKIA. Freight forwarders and brokers believe that ground access to the airport is the number one air cargo problem, but have not offered solutions – their general sense is that they must deal with current conditions, or move.
- **Market Share.** JFKIA is losing market share to other airports, especially as extended range technology allows airlines to fly further inland. JFKIA used to handle (in 1989) 30 percent of all international inbound cargo to the United States; today it handles roughly 21 percent. There are job losses associated with this shift in market share. In 1994 there were 85,000 jobs and $3 billion in wages associated with the movement of air cargo in the greater New York area. Dulles Airport and O'Hare Airport are JFKIA's two leading competitors although the airport has the advantage of being the first major stop on the Great Circle air route over the Atlantic Ocean.

b. New York and Atlantic Railway (NYA)

Potential improvements to enhance NYA's operations in Brooklyn include:

- **Additional Yards.** The NYA would benefit from additional yards in the area. For example, the improvement of Pilgrim and Phelps Dodge would greatly enhance NYA operations and business. These yard improvement projects will, in NYA's view, work independently of any other improvement, including the proposed Cross Harbor tunnel, to improve their business operations by adding capacity. An additional transload facility in Brooklyn would also benefit NYA.
- **Fencing.** Fencing along the Bay Ridge Branch is also needed, as is funding to remove trash from the cut. Trains frequently have to stop to clean up burned out cars, tires, and other trash.
- **Increase Tonnage Limits.** LIRR should allow NYA to increase to 286-ton rail cars under favorable rates similar to those granted by Metro North to freight railways.
- **Eliminate Intermediate Carrier and Increase Float Bridge Frequency.** Eliminating the intermediary carrier, NYCHRR, would improve rail operations in

[12] The NYMTC *Freight Facilities and System Inventory (2000)* defines less-than-truckload as a trailer loaded with consignments of cargo for more than one consignee or for more than one shipper. The cargo usually weighs less than 10,000 pounds and requires the sue of terminal facilities to break or consolidate the shipment.

Brooklyn. By dissolving NYCHRR and having only to make a connection to a mainline railway in New Jersey, the operations would be simplified and more efficient. Currently it takes too long for all commodities except scrap to cross the harbor. A minimal investment in new floats could triple NYA's business.

The NYCEDC has yet to reach an operating agreement with NYCHRR for the 65th Street float bridge. Currently NYCHRR is operating the 51st Street float bridge.

New York City's Economic Development Corporation filed for adverse abandonment against the New York Cross Harbor (NYCHRR) through the Surface Transportation Board (STB). However, if NYCHRR leaves the South Brooklyn waterfront, the City would have to find a replacement operator. NYCHRR and its clients have protested. The City has approached NYA to assume NYCHRR's operating role on the waterfront. However, NYA is hesitant to assume that role because it would inherit the problems of that yard, including pollution and infrastructure problems.

- **Increase Clearance.** Currently there is insufficient clearance for double-stack containers. Increasing overhead clearances would make double-stack transport possible. However, there are challenges, including the underground Buckeye oil pipeline, that make deepening the cut expensive and complicated.
- **Maintain Lease Rates.** Currently NYA is facing a rate increase from LIRR, the lesser of its trackage. NYA currently runs 263-ton rail cars on its LIRR tracks but wants to increase to 286-ton cars. The problem is that LIRR wants to charge 100 percent more for the weight increase. NYA points out that the AAR (American Association of Railroads) claims that wear and tear for 286-ton cars instead of 263-ton cars is only 20 percent higher. Metro North (another branch of MTA) only charges 20 percent more for 286-ton cars, and that rate only applies when 25 percent of their cars are 286 tons. From NYA's point of view, there is no infrastructure impediment to increasing the weight to 286 tons; all bridges and track would continue to perform under increased weight.
- **Haul Additional Waste Material.** NYA also hauls containerized municipal solid waste that originates in Brooklyn and travels to NYA's Maspeth Yard. There is potential to haul additional solid waste from Brooklyn directly by train if there were a transload facility in Brooklyn. The primary benefit for trash haulage by train is diversion of trucks off the streets of the City. NYA estimates that it diverts 124,000 trucks per year by hauling waste by rail in sealed containers.

4. Field Observations

In order to observe and document some of the issues facing goods movement in the study area, the consultant conducted a field scan of most through and local truck routes and major freight facilities in the Borough on March 21 and 22, 2002. Observations fall into several categories, including through truck routes, local truck routes, and other freight facilities.

a. Through Truck Routes

There are two types of through truck routes in Brooklyn. The first type consists of limited access expressways and freeways, such as the Gowanus/Brooklyn-Queens Expressway (I-278) and Prospect Expressway (NY-27). The second type consists of principal and secondary arterials that have been designated through truck routes and offer alternatives to the freeway through truck routes. During two days of field observations, the consultant drove all of the limited access truck routes in the Borough and most of the arterial routes.

The first type of through truck routes, freeways and expressways, carries the majority of through traffic. Generally, traffic congestion on all sections of I-278 (Gowanus and Brooklyn-Queens Expressway) is heavy and slows freight delivery vehicles through the entire Borough, from the Verrazano-Narrows Bridge to the Long Island Expressway (I-495) in Queens. In contrast, the Prospect Expressway is not congested. On the Gowanus Expressway, traffic congestion is especially heavy between 4th Avenue merge with the Shore Parkway to the Manhattan Bridge and Downtown Brooklyn. However, northbound backups onto the Verrazano-Narrows Bridge caused by the Gowanus congestion are not uncommon. Another observation of this route is the tight turning radii for trucks exiting the Gowanus Expressway northbound and southbound to 39th Street.

TRUCK TRAFFIC NORTHBOUND ON THE VERRAZANO-NARROWS BRIDGE

The second type of through truck routes, principal and secondary arterials, carries a small percentage of through truck traffic. Atlantic Avenue is an important east-west truck route through the borough. While Atlantic Avenue does not traverse the Southern Brooklyn study area, it currently serves as the southernmost facility directly connecting the Van Wyck Expressway (I-678) in Queens with Downtown Brooklyn and the Gowanus Expressway (I-278). Currently Atlantic Avenue traffic moves well from its intersection with Conduit Avenue and east to the vicinity of Nostrand Avenue where the Long Island Rail Road is no longer elevated in the median of the avenue. The western section of Atlantic Avenue, from Nostrand Avenue to the Gowanus Expressway, is heavily

congested and will be subject to increased automobile traffic due to the opening of the Atlantic Center at the intersection with Flatbush Avenue. Nonetheless, the eastern portion of Atlantic Avenue (east of Nostrand Avenue) maintains a relatively good traffic flow for through trucks, in part because street-side traffic lanes are not subject to frequent double-parking for loading and unloading. Despite the attractiveness of this section of Atlantic Avenue for through movements, few five-axle trucks were observed.

Similarly, Conduit Avenue, from its intersection with Atlantic Avenue east to its convergence with Linden Boulevard and the Nassau Expressway, is an excellent thoroughfare for through trucks. Through this section, Conduit is a six-lane divided highway with relatively few freight-related land uses that might encumber street-side lanes with double-parked trucks. However, like the Atlantic Avenue section to the west, Conduit does not appear to carry many trucks.

The designated through route for north-south traffic crossing the Borough and the study area consists of a combination of Prospect Expressway, MacDonald Avenue, Church Avenue, and Flatbush Avenue south to Rockaway Beach, Queens. This route links the Gowanus Expressway (via the Prospect Expressway) to destinations in southern Queens and Southern Nassau Counties. In general, this route is congested from its northern origin to the intersection of Flatbush and Nostrand Avenues, which is consequently the end of the Nos. 2 and 5 subway line. Church Avenue, and Flatbush Avenue from Church Avenue to Nostrand Avenue is a congested commercial corridor with many double-parked delivery trucks impeding traffic flow. The intersection of Flatbush and Nostrand Avenues is especially congested. Traffic flow south of Nostrand Avenue on Flatbush Avenue, with the exception of congestion around the Kings Plaza Shopping Center (Flatbush Avenue and Avenue U), is light and capable of handling additional through truck trips. The decreased traffic on this route south of the subway terminus may largely be related to less intense land uses that exist south of the subway route. Overall, this "through" route does not carry many through trucks. Most commercial vehicles using this route are local, single-unit trucks. It does not appear that through trucks use this route.

b. Local Truck Routes

Local truck routes throughout the study area and borough are generally congested. The congested state of the local truck network is largely due to the routing of local deliveries through densely developed commercial corridors. One of the most important and well-used local truck routes is Linden Boulevard. Like most local truck routes, Linden Boulevard is congested in sections where the roadway is narrow and where commercial land uses line the street. In the case of Linden Boulevard, traffic flows well between Conduit Avenue and Remsen Avenue where the roadway is a six-lane divided highway with separated collectors lanes on both sides. Truck traffic moves well on this section of Linden Boulevard but west of Remsen Avenue traffic is congested as the route narrows, commercial and residential density increases, and vehicle flow is encumbered by double-parked delivery trucks.

LOCAL TRUCK TRAFFIC ON LINDEN BOULEVARD

East of the Linden Boulevard corridor, local truck traffic moves slowly along Caton Avenue and Church Street (a through route), both congested with double-parked delivery trucks and vans. East of Caton Avenue and Church Street, 39th Street carries local traffic to and from the Gowanus Expressway and Sunset Industrial Park. Like other local routes described in these observations, 39th Street is a narrow two-lane street through dense residential and commercial areas. 39th Street in particular is subject to heavy truck traffic of combination and local delivery trucks.

39TH STREET IS A HEAVILY USED LOCAL TRUCK ROUTE INTO THE STUDY AREA

Further into the study area, 65th Street is the primary east-west local truck route between the Gowanus Expressway and Southern Brooklyn. Like 39th Street, it is a narrow two-lane street; unlike 39th Street, 65th Street is not burdened by truck traffic. Through the center of the study area, Kings Highway is another local truck route burdened by

congestion and double-parking, especially between McDonald Avenue and 22nd Street. Further east, from 22nd Street to Foster Avenue, Kings Highway becomes more accommodating for commercial vehicles, with 4 lanes, median turn lanes, and collector lanes on both sides.

McDonald Avenue and Coney Island Avenue are primary north-south local truck routes through the study area. McDonald Avenue is heavily congested with double-parked trucks at commercial establishments and warehouses as it passes beneath MTA's elevated F Line. McDonald Avenue is an especially bad facility for local truck movements because of the high level of congestion and the columns for the overhead subway line. In contrast, Coney Island Avenue, which parallels McDonald Avenue, is mostly 4 lanes with a median for turns. Consequently, Coney Island Avenue is a good local truck route.

MCDONALD AVENUE IS A CONGESTED LOCAL TRUCK ROUTE

c. Freight Facilities

The Brooklyn Terminal Market is a major generator of freight trips by trucks delivering fresh goods and other freight. The market serves as an offloading and break-bulk facility where loads are redistributed to smaller vehicles for local delivery. Most trucks arrive and depart the market via Avenue D or other north-south streets to Linden Boulevard, Conduit Avenue, and then to the Van Wyck Expressway (I-678). There is only one obvious truck constraint near the market; there is a low clearance bridge where the elevated subway crosses Linden Boulevard at Avenue D on the heavily used truck route in and out of the market area.

TRUCKS ENTERING AND EXITING BROOKLYN TERMINAL MARKET

Another concentration of freight facilities exists north of the Brooklyn Terminal Market where a number of warehouses along Avenue D generate freight traffic to the Linden Boulevard/Conduit Boulevard/Van Wyck Expressway (I-678) route.

The next most important freight generating facility in the study area, from field observations, is the Kings Plaza Shopping Center at the intersection of Flatbush Avenue and Avenue U. This large enclosed mall is home to Macy's, Sears, and numerous national retailers. Immediately to the east of the mall on Avenue U is a new Home Depot store.

There are numerous freight facilities near the study area that affect freight movement through Southern Brooklyn. The Sunset Industrial Park and South Brooklyn Terminal areas along Upper New York Bay are directly linked to the study area by the 39th Street local truck route. The warehouse concentration between Owl's Head Park and Gowanus Bay is a major generator of truck trips, some of which impact the study area.

On the opposite side of the Borough, in East New York is the East Brooklyn Industrial Park in the vicinity of Pennsylvania Avenue. There is a relatively significant concentration of warehouses that generate truck activity in this area.

Just east of the study area, JFKIA is another important freight-generating facility. Data from the *JFK Cargo Truck Access Study* (presented in Section C of this technical memorandum) show that very few trucks travel through the study area en route to JFKIA. Those trucks that pass through the study area generally use a combination of the Verrazano-Narrows Bridge to the Gowanus Expressway/Brooklyn-Queens Expressway (I-278) to the Long Island Expressway (I-495) to the Van Wyck Expressway (I-678) with the only segment in the study area being a section of the Gowanus Expressway between 65th Street and the Verrazano-Narrows Bridge. This route choice clearly demonstrates the difficulties of driving through the study area or other portions of the Borough en route to the Verrazano-Narrows Bridge. The route is congested with trucks and automobiles,

especially on the Van Wyck Expressway, but is likely faster than crossing on through Southern Brooklyn via the Rockaway Beach peninsula to Flatbush Avenue.

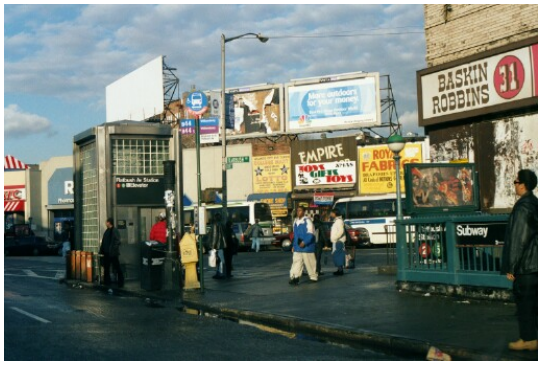
Finally, rail freight movement plays a minor role in the study area. The Bay Ridge Branch, owned by the Long Island Rail Road and operated by the New York and Atlantic Railway, links New Jersey and the Sunnyside Yard (Queens) via rail float bridges in Sunset Park near the Brooklyn Army Terminal. The line is of strategic importance because it is the only transportation right-of-way that crosses the Borough grade-separated from surface streets both in a cut and on viaduct.

THE BAY RIDGE LINE NEAR BROOKLYN TERMINAL MARKET

Chapter IV: Socioeconomic Conditions

A. OVERVIEW OF STUDY AREA

The primary study area (see Figure I-1, Study Area) is comprised of most of three Community Districts (Community Districts 10, 11 and 18) and portions of seven Community Districts (Community Districts 5, 12, 13, 14, 15, 16 and 17). Some of the major neighborhoods within or partly within this area include Bath Beach, Bay Ridge, Bensonhurst, Bergen Beach, Borough Park, Brighton Beach, Canarsie, Coney Island, Ditmas Park, Dyker Heights, East Flatbush, Flatbush, Flatlands, Fort Hamilton, Georgetown, Gerritsen Beach, Gravesend, Homecrest, Kensington, Manhattan Beach, Manhattan Terrace, Marine Park, Midwood, Mill Island, Ocean Parkway, Old Mill Creek, Paerdegat Basin, Plum Beach, Prospect Park South, Sea Gate, Sheepshead Bay, Spring Creek and Starrett City.[1]



THE SBTIS STUDY AREA IS CHARACTERIZED BY ITS DIVERSE NEIGHBORHOODS, HOUSING STOCK, AND COMMERCIAL AND CULTURAL ATTRACTIONS

The character of much of the study area is defined by its historic low- and mid-rise neighborhoods focused around mixed-use corridors that serve as local retail and service spines; the maritime history and natural character of some of its waterfront areas; its diverse housing stock ranging from single-family homes to the high-rise towers of

1 New York City Department of City Planning, 2002.

Starrett City; its world-class recreational attractions; and the role that the area has played in the development of the city. It serves as a gateway to New York Harbor, as an international gateway with its proximity to JFKIA, and as home to communities of immigrants and working class neighborhoods. The area's distribution and transportation-related facilities, such as the Brooklyn Terminal Market, have fueled the city's engine of commerce. It is an area with a rich history of settlement, including landmarks related to the Dutch Colonial period and the Revolutionary War; one of the city's oldest thoroughfares, Kings Highway; and, one of the city's remaining local centers of fishing industry in Sheepshead Bay.

Most recently, the area has seen growth and increasing diversity in its population, although several census tracts in the vicinity of Coney Island – which has an older population on average – have experienced a decrease in total population between 1990 and 2000. New development, such as Gateway Estates, Keyspan Stadium and big box retail, is bringing more of a regional focus to the area's retail, entertainment and recreational offerings, and additional housing for the elderly and for moderate-income households are expanding the area's range of housing opportunities. Tying together the existing and emerging activity centers within the study area are a range of transportation facilities, including the Belt Parkway that forms part of the study area's southern boundary, numerous thoroughfares that serve as both retail hubs and traffic arteries, pedestrian corridors such as the multi-use paths running alongside Shore Parkway and Ocean Parkway, elevated subway lines extending as far south as Bensonhurst, Coney Island, Fort Hamilton and Spring Creek, a network of surface transit lines, and expanding ferry service, including high speed ferries, that have increased commuting options.

Socioeconomic conditions are summarized in this chapter; demographic tables are presented in Appendix D.

B. POPULATION TRENDS 1990-2000

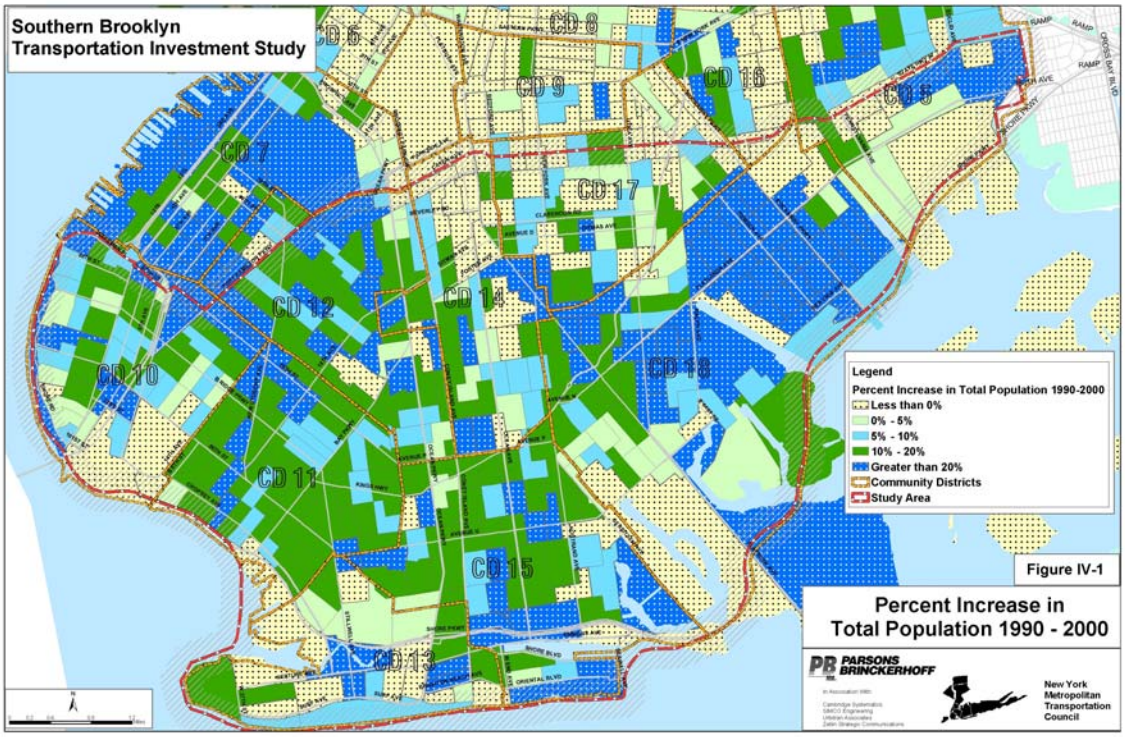
According to the 2000 US Census, the total population of the TIS primary study area of 1,232,510 persons comprises nearly half the total population of the Borough of Brooklyn. The 11 percent increase in total population within the study area during the 1990s was significantly higher than the rate of increase for the borough, suggesting that transportation improvements may be needed to serve the area's growing population. Table IV-1 compares population trends between the study area, Brooklyn and the city between 1990 and 2000. (See Figure IV-1, Percent Increase in Total Population.)

TABLE IV-1
TOTAL POPULATION 1990 – 2000
STUDY AREA COMPARED TO BROOKLYN AND NEW YORK CITY

Place	1990 Total Population	2000 Total Population	1990 – 2000 Change in Population	Percentage Change
NYC	7,322,564	8,008,278	685,714	9.36 percent
Brooklyn	2,304,914	2,465,326	160,412	6.96 percent
Study Area	1,109,183	1,232,510	123,327	11.12 percent

Source: US Census Bureau, 2000.

FIGURE IV-1
PERCENT INCREASE IN TOTAL POPULATION



1. 2000 Age Characteristics of the Population

The population of the study area is slightly older on average than both the Borough of Brooklyn and the city as a whole, with a 2000 median age of 36.2, versus 33.1 for Brooklyn and 34.2 for New York City. Several neighborhoods within the study area stand out in terms of their age characteristics. For example, census tracts within the neighborhoods of Sheepshead Bay, Bath Beach, Dyker Heights and Bay Ridge generally have median ages ranging in the 40's, indicating the presence of relatively older populations in these areas. The Sheepshead Bay, Coney Island and Gerritsen Beach neighborhoods in particular also have concentrations of census tracts with relatively high percentages of persons above the age of 65. (See Figure IV-2, Percent of Population Above the Age of 65.) In the western portion of the study area, the Borough Park neighborhood has a concentration of census tracts showing median ages that generally ranged in the 20's, indicating the presence of a relatively younger population on average, although concentrations of persons above age 65 are also present in this diverse community that contains a large population of Orthodox Jewish residents. Census tracts with high percentages of school age children (persons age 16 and under) are present in the Midwood and Spring Creek neighborhoods in particular.

Concentrations of elderly and younger populations suggest a potential need for transportation services tailored to these groups who typically rely heavily on public transportation and have special needs in terms of accessing senior services and educational facilities.

2. 2000 Racial Characteristics of the Population

The study area contains a lower percentage of minority residents compared to the Borough of Brooklyn as a whole, although it has increased in its diversity over the last ten years. Approximately half of the study area's population was White non-Hispanic in 2000, higher than both the Borough of Brooklyn and New York City, which are both approximately one third White non-Hispanic. African American non-Hispanic residents comprised 27 percent of the population – slightly higher than the percentage for New York City (25 percent) – while Hispanic residents comprised 10 percent of the population. A slightly higher number of Asians resided within the study area (10 percent) than in Brooklyn and the city as a whole. Concentrations of minority residents are generally located in neighborhoods in the eastern portion of the study area and in Coney Island, with the highest concentrations found in the easternmost census tracts of Community District #5 (Spring Creek). Table IV-2 shows the racial composition of the study area population as revealed in the 2000 Census.

FIGURE IV-2
PERCENTAGE OF POPULATION ABOVE THE AGE OF 65

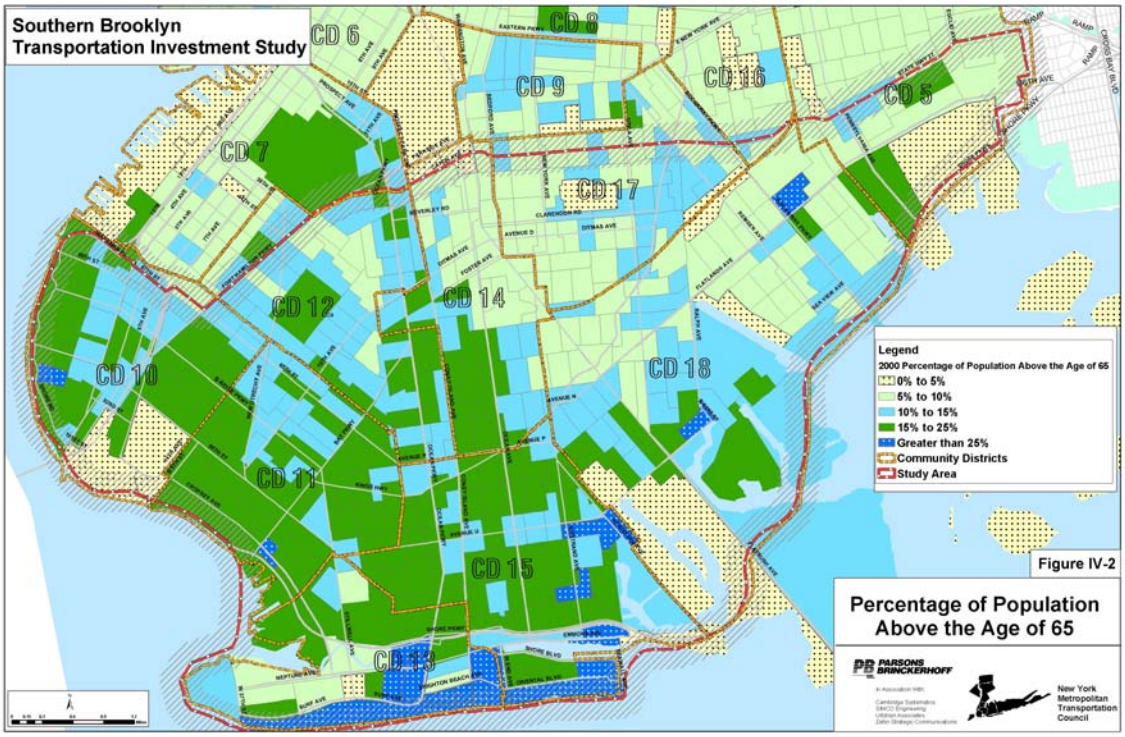


TABLE IV-2
RACIAL CHARACTERISTICS OF THE POPULATION (2000)
STUDY AREA COMPARED TO BROOKLYN AND NEW YORK CITY
(PERCENT OF POPULATION)

Place	White Non-Hispanic	African American Non-Hispanic	Hispanic	Asian	Other Groups	2 Races	3 or More Races
NYC	34.98%	24.50%	26.98%	9.74%	0.99%	2.68%	0.13%
Brooklyn	34.66%	34.42%	19.79%	7.48%	0.87%	2.67%	0.12%
Study Area	50.30%	26.59%	9.87%	9.96%	0.60%	2.85%	0.10%

Source: US Census Bureau, 2000.

3. 2000 Income, Poverty and Employment Status

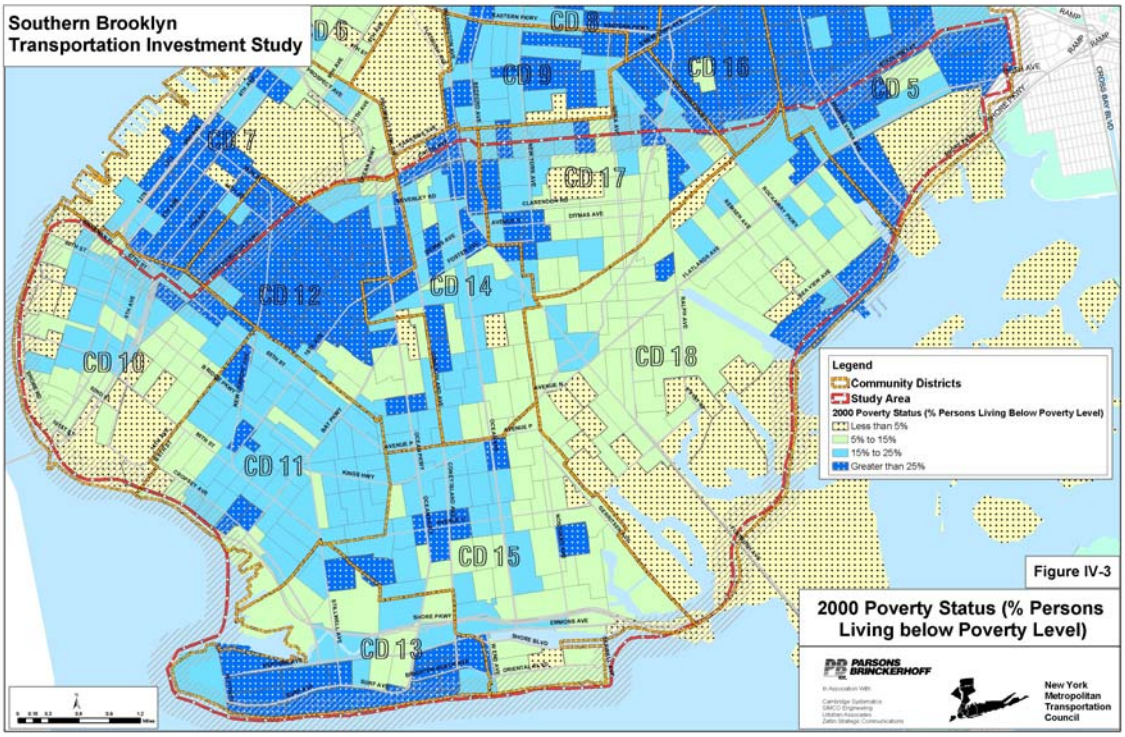
The study area's population is, on average, more affluent than that of the Borough of Brooklyn and slightly more affluent compared to New York City as a whole. Its 2000 median household income of $38,447 is 16 percent greater than that of the Borough of Brooklyn ($33,056) and about the same as that of New York City ($38,293). The study area's labor force has an unemployment rate that is slightly lower than that of the Borough of Brooklyn and New York City (nine percent for study area versus 10 percent for New York City and 11 percent for Brooklyn). Table IV-3 compares these rates. (See Figure IV-3, Poverty Status.)

TABLE IV-3
POVERTY STATUS AND UNEMPLOYMENT RATE (2000)
STUDY AREA COMPARED TO BROOKLYN AND NEW YORK CITY

Place	Total Population	Population Below Poverty Level	Percent of Total Population Below Poverty Level	Labor Force	Percent of Labor Force Unemployed
NYC	8,008,278	1,668,938	20.84%	3,626,865	9.56%
Brooklyn	2,465,326	610,476	24.76%	1,039,512	10.73%
Study Area	1,232,510	244,900	19.87%	520,002	8.55%

Source: US Census Bureau, 2000.

FIGURE IV-3
POVERTY STATUS



Within the study area, concentrations of census tracts with greater than 20 percent of their population living below the poverty level were present in the Borough Park, Prospect Park South, Coney Island and Spring Creek neighborhoods. According to data from the New York City Human Resources Administration, in 1999 the Community Districts that encompass these neighborhoods also had the highest percentages of population relying on income support (29.4 percent for Community District 12; 23.6 percent for Community District 14; and 35.7 percent for Community District 5).[2]

C. HOUSING CHARACTERISTICS

The study area contains a diverse mix of housing types, including low density single-family homes, rowhouses, mid-rise apartment buildings, and high rise housing. Population densities generally range from 25 to 50 persons per acre in areas such as Marine Park, Bergen Beach and Georgetown, to 100 to 150 persons per acre in areas such as Borough Park and Kensington, and over 150 persons per acre in portions of Prospect Park South (source: US Census Bureau, 2000; New York City Department of City Planning Population Division). The 2000 Census showed a relatively high value of homes within the study area ($243,650) in comparison to the Borough of Brooklyn ($219,300) and the city as a whole ($221,200). The median rent level in the study area ($735) was similarly higher than that of Brooklyn ($703) and New York City ($705).

While the study area's median household size (2.8 persons per household) is consistent with that of the rest of the borough and the city, considerable variation in household size exists between different neighborhoods. For instance, households within the Bay Ridge neighborhood had generally smaller sizes of under two persons per household in 2000, while neighborhoods such as Borough Park, Flatbush, East Flatbush, Flatlands, and Canarsie had concentrations of census tracts with median household sizes ranging between 3 and 4 persons per household.

D. COMMUTATION PATTERNS

According to the 2000 Census, a higher percentage of workers within the study area commuted to work via automobile (40 percent) than in Brooklyn (32 percent) and New York City as a whole (36 percent). The most popular mode of commutation of workers in the study area was by transit (52 percent), while seven percent of the workforce commuted by either walking or cycling. Commuter rail comprised a relatively smaller percentage of commuters, since there are no LIRR stations within the study area. Table IV-4 and Table IV-5 compare the 1990 and 2000 Journey to Work characteristics of the study area, the Borough of Brooklyn and New York City. Although small in number, the most notable percentage increases within the study area during the 1990's were for workers commuting via ferry (29 percent increase) and workers commuting via bicycle (82 percent increase).

[2] New York City Department of City Planning, 2002

TABLE IV-4
COMMUTATION/JOURNEY TO WORK PATTERNS (1990)
STUDY AREA COMPARED TO BROOKLYN AND NEW YORK CITY

Place	By Car	By Subway	By Bus	By Train	By Streetcar	By Ferry	By Taxi	By Bicycle	By Walking
NYC	1,036,654	1,168,346	403,477	54,716	7,938	16,619	50,096	9,643	340,077
Brooklyn	283,765	399,067	104,298	13,775	3,045	446	5,672	2,264	75,664
Study Area	175,768	177,383	54,305	5,720	1,287	192	2,496	947	31,679

Source: US Census Bureau, 1990.

TABLE IV-5
COMMUTATION/JOURNEY TO WORK PATTERNS (2000)
STUDY AREA COMPARED TO BROOKLYN AND NEW YORK CITY

Place	By Car	By Subway	By Bus	By Train	By Streetcar	By Ferry	By Taxi	By Bicycle	By Walking
NYC	1,049,396	1,199,266	364,408	51,141	5,101	11,193	53,781	15,024	332,264
Brooklyn	274,301	403,327	93,767	12,169	1,799	424	6,149	4,846	78,993
Study Area	176,140	175,570	54,934	5,610	829	248	2,994	1,726	33,941

Source: US Census Bureau, 2000.

As Figure IV-4 and Figure IV-5 illustrate, neighborhoods within the study area exhibited different Journey to Work characteristics in 1990. For instance, workers residing in Community District 18, located in the southeast corner of the study area, used transit to a lesser extent than other areas, while the East Flatbush, Prospect Park South and Coney Island neighborhoods had relatively higher percentages of workers commuting by transit. Conversely, the Community District 18 neighborhoods of Paerdegat Basin, Georgetown, Bergen Beach and Mill Island had the highest rates (generally 50 percent to 70 percent) of automobile commuters in the study area. Marine Park, Midwood, Gravesend and Dyker Heights also showed higher percentages of workers commuting by automobile. Borough Park had markedly higher rates of commuters traveling by bicycle or walking than other areas, with the exception of the Stillwell Avenue area of Coney Island, which also had over 25 percent of its labor force commuting via non-motorized means. The western portions of the study area exhibit generally higher rates of commutation by walking or bicycle than the eastern portions, including portions of Bay Ridge, Gravesend, Brighton Beach, Coney Island, Manhattan Terrace and Kensington where rates ranged between 5 percent and 15 percent or greater.

On average, more households in the study area (52 percent) have more than one vehicle than in both the City (44 percent) and Brooklyn (43 percent). The Bay Ridge and Midwood sections have the highest rates of multiple-vehicle households.

FIGURE IV-4
LABOR FORCE COMMUTATION BY TRANSIT

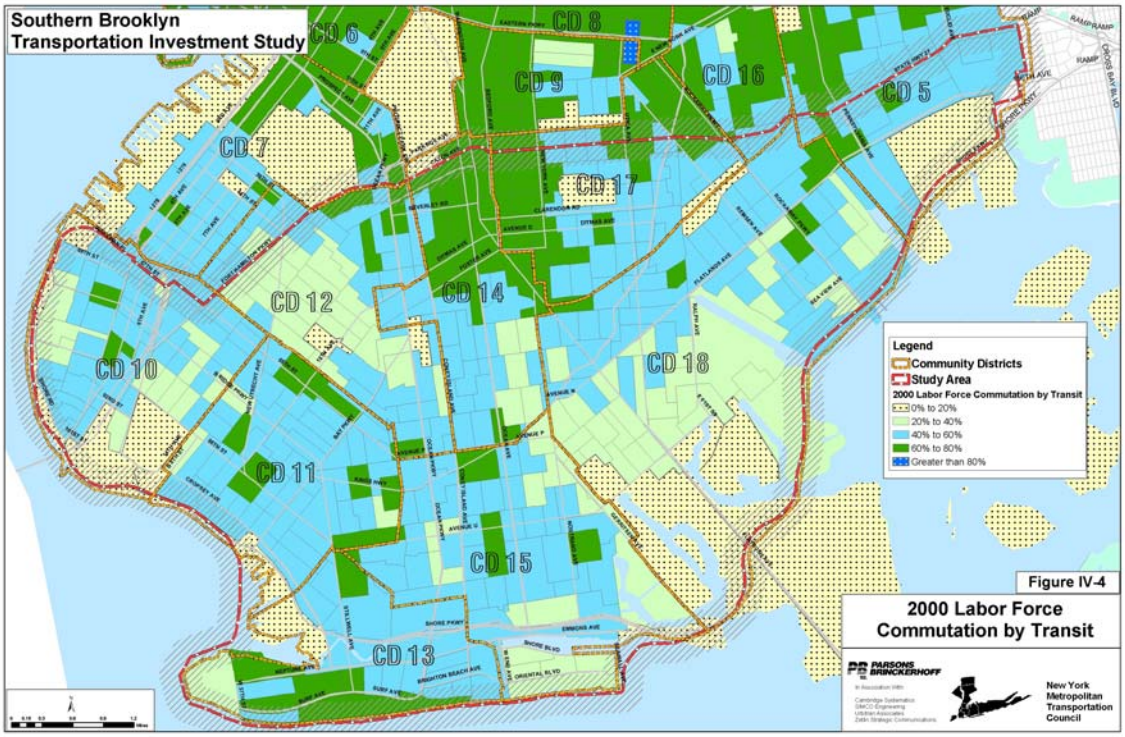
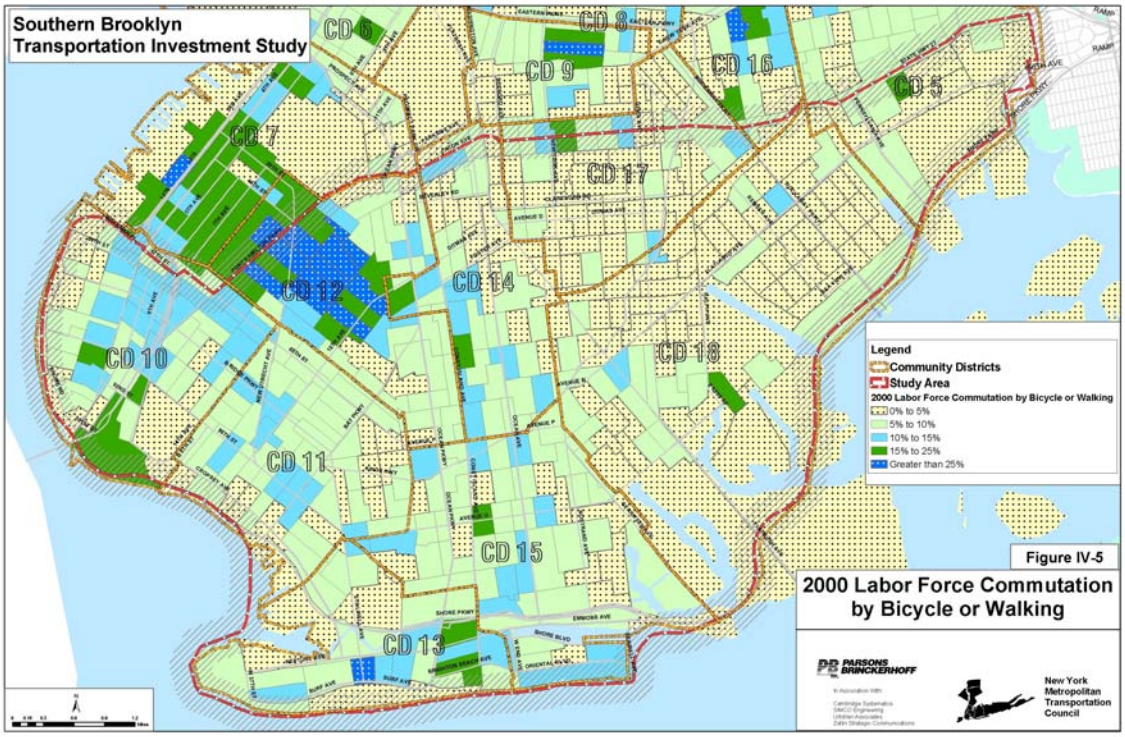


FIGURE IV-5
LABOR FORCE COMMUTATION BY BICYCLE OR WALKING



E. POPULATION FORECASTS

Population forecasts prepared for NYMTC in 1995 (*Demographic and Socioeconomic Forecasting Technical Memorandum,* Urbanomics, December 2000*)* suggest that the New York Metropolitan region will generally see a slow rate of growth through the year 2025 (12.5 percent between 2000 and 2025) with New York City forecast to see an increase of only 5.9 percent. The Borough of Brooklyn was forecast to see an increase of only 2.8 percent in its total population between 2000 and 2025, the lowest forecast rate of growth of the five boroughs and the third lowest forecast rate of growth of the 31 counties in the region. Slight-to-moderate growth of 3.5 percent was forecast to occur in Brooklyn in the period 2010-2025, with a slight drop in population of 0.6 percent forecast for Brooklyn in the ten-year period between 2000 and 2010 (the only county forecast to see a decrease during this period).

The actual population count from the 2000 Census indicated a total population for New York City of 8,008,278 persons, higher than NYMTC's 1995 forecast of 7,449,464. For the Borough of Brooklyn, the forecast year 2000 population of 2,267,300 persons was also lower than the actual 2000 total population recorded by the 2000 Census (2,465,326 persons). The greater than expected increase in population citywide is a result of both a real increase in the city's population as well as improved census coverage compared to 1990. It should be noted that NYMTC's population forecasts provide a long-term outlook, and short-term variations may not necessarily be indicative of long-term trends.

According to NYMTC's 1995 population forecast, between 2000 and 2025, New York City is expected to become increasingly diverse in its demographic composition, with a 24 percent decrease in the White population and 8.7 decrease in the Black population. Projected increases were forecast among the Asian (91 percent) and Hispanic (29 percent) populations. Significant increases were also forecast in the city's senior population (65 years of age and above). These trends are particularly relevant for the Southern Brooklyn study area, which has a diverse population that is also generally older than that of the borough and the city.

F. LABOR AND EMPLOYMENT

Overall, the city's economy declined in 2001, with job losses continuing into 2002, partly as a result of the economic impacts of the September 11th tragedy. As of November 2001, the Borough of Brooklyn had an unemployment rate of 7.6 percent, which was the fourth highest rate of counties in New York State.[3] The major trend in employment in the Borough of Brooklyn, like the city and the nation as a whole, has been a shift away from manufacturing to service sector employment. This trend is evident in the study area, with non-residential development now planned consisting of retail and service related uses. Figure IV-6 indicates the breakdown of employment by industry in the zip codes found in the study area, with Table IV-6 showing borough-wide trends in employment by industry between 1987 and 2000.

[3] New York State Department of Labor, Division of Research and Statistics, "Employment in New York," January 2002.

TABLE IV-6
BROOKLYN EMPLOYMENT TRENDS BY INDUSTRY: 1987-2000

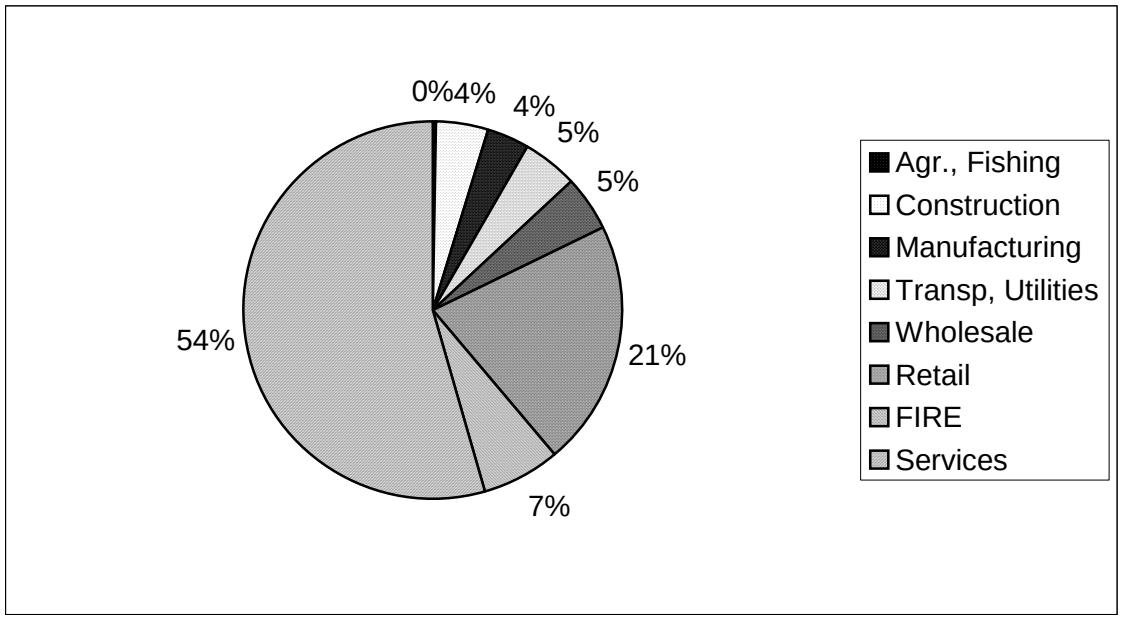
Industry	1987	% of Workforce	1995	% of Workforce	1999	% of Workforce	2000	% of Workforce	% Change 1999-2000	% Change 1987-2000
Manufacturing	73,336	18%	52,011	12.60%	44,876	10.40%	41,732	9.43%	-7%	-43.09%
Durable Goods					13,546	3.14%	12,757	2.88%	-5.80%	
Non-Durable Goods					31,329	7.26%	28,975	6.54%	-7.50%	
Agriculture & Mining					831	0.19%	799	0.18%	-3.90%	
Construction	20,230	5%	17,951	4.30%	22,545	5.22%	23,883	5.39%	5.90%	18.06%
T.P.U.	22,970	5.60%	23,837	5.80%	24,825	5.75%	25,860	5.84%	1.60%	12.58%
Wholesale Trade					27,969	6.48%	28,008	6.33%	0.10%	
Retail Trade					65,369	15.14%	66,792	15.09%	4.20%	
Total Trade	96,791	23.70%	87,070	21%	93,338	21.62%	94,800	21.41%	2.20%	-2.06%
F.I.R.E.	22,099	5.40%	26,458	6.40%	27,490	6.37%	27,005	6.10%	-1.80%	22.20%
Services	133,392	32.70%	167,975	40.60%	184,161	42.66%	191,427	43.23%	3.90%	43.51%
Government	36,679	9%	35,720	8.60%	32,241	7.47%	33,808	7.64%	4.90%	-7.83%

Source: New York State Dept of Labor

Decisions over business relocations following the September 11th tragedy may also play a factor in employment trends in the Borough of Brooklyn, with examples of existing firms previously located in downtown Manhattan that have moved to downtown Brooklyn. This regional subcenter is expected to see major office and institutional development over the long term, partly as a result of the City's Downtown Brooklyn rezoning initiative, and potentially contributing to increases in employment.

Employment in the primary study area is dominated by service sector employment, health related firms and institutions, educational services, social services, wholesale and retail establishments; and industrial, transportation and utility related firms. New York State Department of Labor employment data from 2001 indicates that zip codes within or overlapping with the primary study area contain a total of 171,005 jobs within 19,855 firms. The greatest number of employees work within service related businesses (91,958 employees), including the health industry, with a total of 41,230 jobs, social services (18,941 jobs) and educational services (11,221 jobs). Retail trade establishments employ 35,476 workers within this area. Figure IV-6 shows the percentage of total employment by industry within these 17 zip code areas. Figure IV-7 shows the distribution and concentration of households and employment in the study area.

FIGURE IV-6
EMPLOYMENT BY INDUSTRY WITHIN SOUTHERN BROOKLYN AREA ZIP CODES



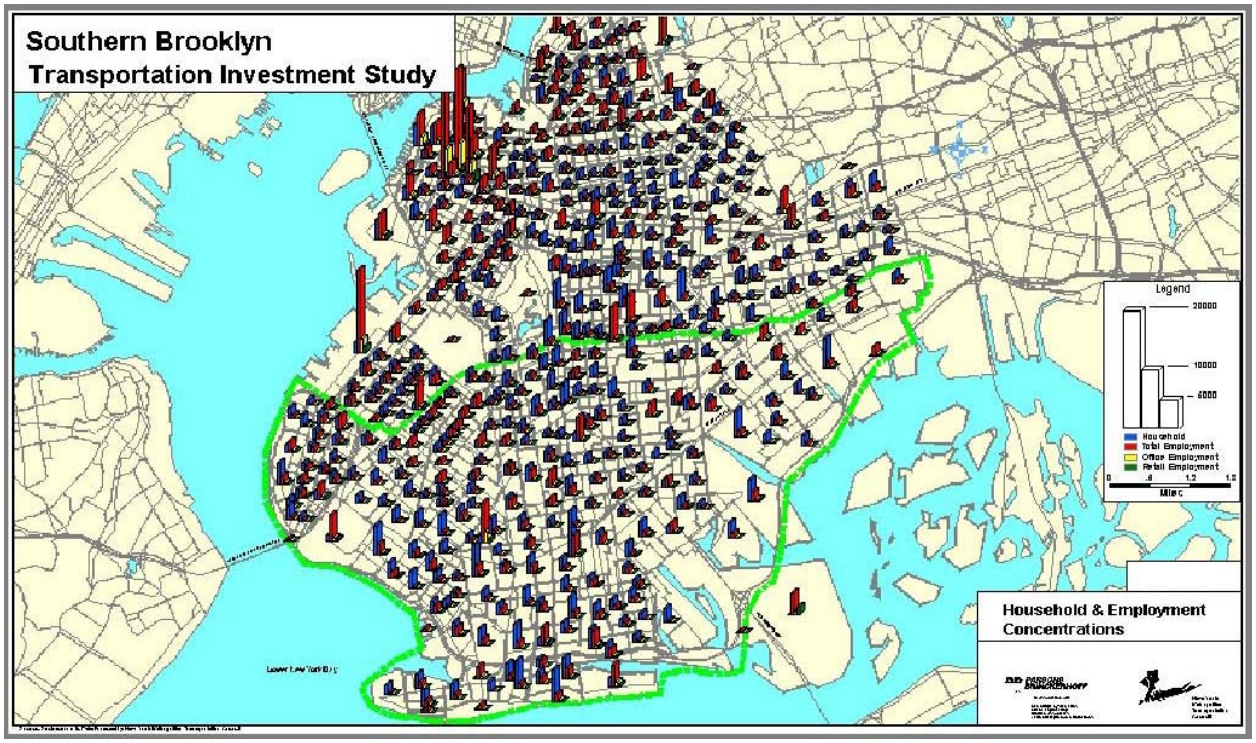
Source: New York State Department of Labor, ES202 File, 1st Q 2001

Transportation, communications and utility firms employ 8,345 workers within the zip code areas in the vicinity of the primary study area.[4] The greatest concentrations of employees of freight-related firms can be found in the Bath Beach, Canarsie, and Flatlands areas. These include industrial distribution and transportation-related firms located on corridors such as Foster Avenue, Cropsey Avenue, New Utrecht Avenue, Utica Avenue, Avenue U, Ditmas Avenue, and McDonald Avenue, among others, and food distribution firms within the Brooklyn Terminal Market.

Retail-related employment centers include Kings Plaza shopping center, which is home to large retailers such as Sears and Macy's, as well as Lowes Cineplex theater. Commercial activity is also concentrated along retail and service-related corridors such as Rockaway Parkway, Bay Parkway, 86th Street, 18th Avenue, Ralph Avenue, Flatbush Avenue, Kings Highway, Neptune Avenue and Nostrand Avenue. These retail corridors generally contain both small shops as well as larger commercial establishments such as Key Food Supermarket, CVS Pharmacy, Waldbaum's Supermarket, Genovese Drug Store; PC Richard & Sons and Century 21 Department Stores. Auto sales establishments can be found along stretches of 4th Avenue, Nostrand Avenue, 86th Street, Glenwood Road and Flatbush Avenue, among others.

4 New York State Department of Labor, Division of Research and Statistics, ES202 File, 1st Q 2001.

FIGURE IV-7
HOUSEHOLDS AND EMPLOYMENT CONCENTRATIONS



Other large employers within the study area include Brooklyn College and other educational facilities, post offices, and fuel and chemical-related industries such as Bayside Fuel, Manhattan and Queens Fuel, Glissen Chemical, Coastal-Empire State Fuel, and Favorite Plastics. Although in some cases their workers are widely dispersed during working hours, transportation-related businesses comprise some of the largest employers within the study area, many with more than 100 employees. These include Brighton Bus & Coach, Avenue J Car Service, Daily Truck Rental, Geri Transportation, Able Bus, Always Available Private Car, Church Avenue Car Service, and Cloverdale Car. Other transportation-related employment centers include NYC Transit's facility at 6201 New Utrecht Avenue, which employs 100 workers.

The largest employers of freight-related firms within the study area and Borough of Brooklyn are shown in Table IV-7 (firms with 500 employees or more). There are a total of 32,643 employees of freight-related firms (from trucking firms to grocery stores) with more than 20 employees located within zip code areas in the vicinity of the study area.[5]

Economic Development incentives and assistance are available to study area businesses through the agencies including the New York City Department of Business Services, the New York City Economic Development Corporation, the New York State Empire State Development Corporation, and the Brooklyn Economic Development Corporation. The Brooklyn Economic Development Corporation has provided training, technical assistance and counseling to over 20,000 established or potential business owners in Brooklyn.

Business improvement districts (BIDs) have been established along a number of major commercial corridors in the study area. These include Church Avenue, Kings Highway and Bay Ridge's 86th Street. New BID's are currently being formed for Flatbush Avenue and Nostrand Avenue.[6] These organizations provide services such as sanitation, security and beautification. Just outside of the study area, in Sunset Park, the Southwest Brooklyn Empire Zone program encourages business development through targeted incentives and benefits to new and expanding commercial and industrial firms. The Sunset Park waterfront is home to the South Brooklyn Marine Terminal, a meat cooperative market, and the Brooklyn Army Terminal, which are major generators of employment and potential business relocation sites, including a technology-oriented business incubator, the Sunset Park Technology District, sponsored by the Southwest Brooklyn Industrial Development Corporation. Approximately 3,000 jobs are located along Sunset Park's working waterfront.[7]

5 InfoUSA, 2001.
6 Crain's New York Business, *City Turnaround Means Winning BIDs*, 9/2/02, p 16.
7 Southwest Brooklyn Industrial Development Corporation.

TABLE IV-7
LARGE EMPLOYERS WITHIN BROOKLYN AND SOUTHERN BROOKLYN STUDY AREA
(Companies within Study Area* in Bold)

Company	Address	Number of Employees	Description
Manhattan & Bronx Surface	370 Jay St	41,997	Transit lines
Rainbow Apparel CO*	**1000 Pennsylvania Ave**	**8,000**	**Women's apparel-retail**
Source-Displays Brand Div*	**744 Berriman St**	**8,000**	**Display fixtures & materials (wholesale)**
Strober Brothers Inc	3 Furman St	8,000	Building materials
Key Span Corp	1 Metrotech Ctr	7,000	Natural gas transmission & distribution
Approved Moving & Storage Inc	360 Kosciusko St	2,100	Movers
Brumar Sheet Metal Inc	498 Leonard St	1,999	Sheet metal fabricators
Tate & Lyle Domino Sugar Corp	266 Kent Ave	1,600	Beet sugar (manufacturers)
Peerless Importers	16 Bridgewater St	1,200	Wines-wholesale
Victory Memorial Hospital*	**699 92nd St**	**1,200**	**Nursing & convalescent home**
Bayside Fuel Oil Corp*	**1820 Cropsey Ave**	**900**	**Oils-fuel (wholesale)**
Macy's	422 Fulton St	800	Department store
Official Moving Systems	231 Norman Ave	800	Movers
Waste Management Inc	101 Varick Ave	800	Garbage collection
Mc Govern Ebb Florist	750 5th Ave	768	Florists-retail
Pfizer Inc	630 Flushing Ave	700	Pharmaceutical preparation
Young World Stores	1 Hoyt St Fl 8	650	Children & infants wear-retail
Macy's*	**5400 Avenue U**	**600**	**Department store**
Arthur Matney CO Inc	4014 1st Ave	500	Perfumes cosmetics/toilet preps (mfrs)
Blue Ridge Farms Inc	3301 Atlantic Ave	500	Salads (wholesale)
Century 21*	**472 86th St**	**500**	**Department store**
Key Food Coop*	**8925 Avenue D**	**500**	**Grocers-wholesale**

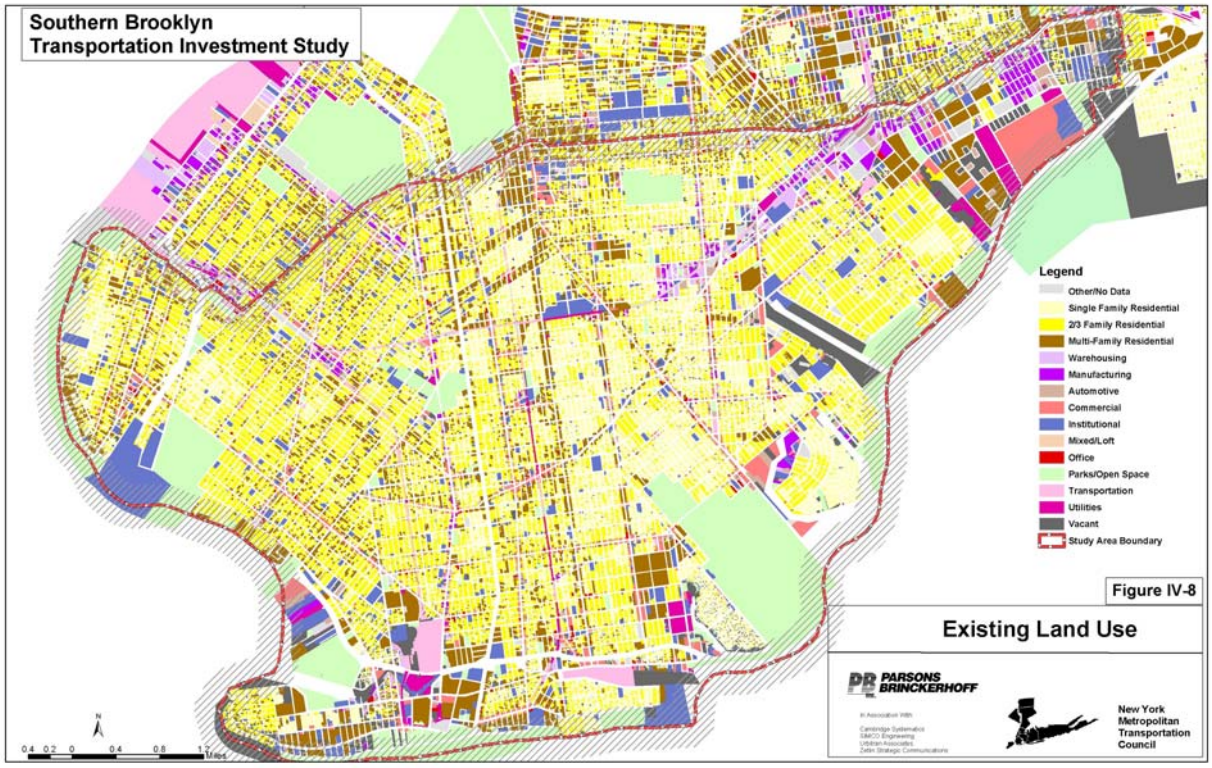
Source: InfoUSA

G. LAND USE

As indicated in Figure IV-8, Existing Land Use, residential is the largest category of land use in the primary study area, with single- and two-family homes predominating. Compared to the rest of the borough, population densities are relatively low. Single- and two-family homes comprise between approximately 40 percent and 50 percent of the total lot area of community districts 10, 11, 12, 14, 15 and 17 with multi-family residential development comprising between approximately 10 percent and 30 percent of these districts. Community Districts 5 and 18 have relatively lower amounts of residential uses as a percentage of their total lot areas due to the concentration of public facility/utility uses in Community District 18 (34 percent of lot area) and open space and outdoor recreation uses in Community District 5 (19 percent).[8]

8 New York City Department of City Planning, Community District Needs Statement, 2001.

FIGURE IV-8
EXISTING LAND USE



Some of the largest housing complexes within the study area include Starrett City, a high-rise apartment community centered on Pennsylvania Avenue west of Spring Creek Basin, Glenwood Housing, located at Farragut Avenue and Ralph Avenue, Bay View Houses, located at Rockaway Parkway and Seaview Avenue, Sheepshead Houses and Nostrand Houses, located at Batchelder Street and Avenue V, and Marlboro Houses, located at West 11th Street and Avenue V.

Commercial and office uses occupy between 3 percent and 5 percent of the lot area of the study area's community districts and are primarily concentrated along mixed use thoroughfares that are the focal points of their surrounding neighborhoods. These include thoroughfares such as 86th Street in Bath Beach, New Utrecht Avenue in Bensonhurst and Borough Park, 3rd Avenue and 5th Avenue in Bay Ridge and Fort Hamilton, 13th Avenue in Dyker Heights and Borough Park, McDonald Avenue in Gravesend, Borough Park and Kensington, Avenue U running from Gravesend to Marine Park, Coney Island Avenue and Nostrand Avenue (both running north-south through the center of the study area), Church Avenue in East Flatbush, Ralph Avenue (located between Georgetown and Flatlands), Flatbush Avenue (traversing Marine Park and Flatbush) and Rockaway Parkway in Canarsie and East Flatbush. Concentrations of employment and retail activity can also generally be found at nodes around subway stations. Some of the largest retail concentrations is the Kings Plaza Shopping Center and the newly opened retail component of Gateway Estates. Commercial uses are also interspersed in mixed-use areas of Borough Park, Sheepshead Bay, Bay Ridge, Canarsie and Flatbush. Several large retail uses are planned near the Gravesend Bay waterfront south of the Shore Parkway, strengthening this portion of the borough as a retail destination. The introduction of big box retail stores such as Costco and Home Depot will likely draw shoppers from other parts of the borough and region.

Concentrations of industrial uses can be found north of the Canarsie neighborhood and in Spring Creek, in an area between approximately 59th and 64th Streets, between approximately 5th Avenue and 16th Avenue. An approximately 40-block industrial corridor several blocks wide separates the Sunset Park and Dyker Heights/Bay Ridge neighborhoods. Another large concentration of industrial uses that includes the Brooklyn Terminal Market is spread across a corridor that extends between approximately Kings Highway and East 108th Street, and between Stanley Avenue on the south and Avenue B on the north. Other industrial uses, heavy commercial and automotive uses, including a marine transfer station, are located in an industrial district located on the waterfront to the east of Bay Parkway.

Institutional uses comprise some of the largest employers in the study area, as well as some of the major destinations for travelers within the study area. Large hospitals within the study area include the Brooklyn Development Center on Fountain Avenue, an approximately 400-bed Intermediate Care facility; Coney Island Hospital on Ocean Parkway, a 472-bed hospital; the Veterans Administration Hospital at Poly Place, an 859-bed hospital; Kings Highway Hospital – BIMC, located at 3201 Kings Highway with 212 beds; and Victory Memorial Hospital, a 260-bed hospital located at 9036 Seventh Avenue.

Educational facilities, including public schools, private and parochial schools and colleges, also comprise major destinations within the study area. Public schools in the study area with enrollments of more than 2,500 students include the following:

TABLE IV-8
LARGE PUBLIC SCHOOLS (OVER 2,500 ENROLLMENT) WITHIN THE STUDY AREA

School	Address	Enrollment
Fort Hamilton High School	8301 Shore Road	4,105
New Utrecht High School	1601 80th Street	2,734
Midwood High School	2502 Glenwood Road	3,982
Sheepshead Bay High School	3000 Avenue X	3,033
James Madison High School	3787 Bedford Avenue	3,741
South Shore High School	6565 Flatlands Avenue	3,155
Franklin D. Roosevelt High School	5800 20th Avenue	3,952
Edward R. Murrows High School	1600 Avenue L	4,060
Samuel J. Tilden High School	5800 Tilden Avenue	2,212
Canarsie High School	1600 Rockaway Parkway	2,835

Source: New York City Department of City Planning, 2001

Colleges within the study area include Brooklyn College (CUNY), located at 2900 Bedford Avenue, with an enrollment of 12,364 students, and Kingsborough Community College, located on Coney Island.

The largest parks within the study area are located on or near waterfront areas, including Jamaica Bay, Rockaway Inlet, Gravesend Bay, The Narrows, and several inlets and basins including Paerdegat Basin, Fresh Creek Basin, Hendrix Creek, East Mill Basin, and Gerritsen Creek. Although access to these waterfront parks has been an issue for some inland areas, passive and active recreational facilities can be found at Dyker Beach Park, a waterfront park flanking the Shore Parkway, Dreier-Offerman Park, a waterfront park facing Coney Island Creek, Marine Park, a waterfront park located at Avenue U, Owl's Head Park, located in Bay Ridge, and a string of waterfront parks facing Gateway National Recreation Area such as Bergen Beach, Canarsie Beach Park and Spring Creek Park. Further inland, parkland consists mostly of smaller athletic fields and playgrounds, although just north of the study area is Prospect Park, a major recreation destination for residents of the entire borough. Coney Island Beach and Brighton Beach, with their world famous boardwalks and proximity to the Coney Island Amusement Park, New York Aquarium and Keyspan Stadium, are major recreational destinations in New York City. Coney Island was considered to be the world's largest amusement area in the first half of the 20th Century, and several of its rides are designated New York City historic landmarks (Parachute Jump, Cyclone Roller Coaster, Wonder Wheel).

H. LOCAL AND COMMUNITY PLANS

1. 197-a Community Plans

New York City Charter Section 197-a allows New York City Community Boards to propose plans for the development, growth and improvement of their districts. Once

approved by the City Planning Commission and adopted by the City Council, 197-a plans serve as policy guides for subsequent actions by city agencies. No community 197-a Plans have been or are in the process of being prepared for community boards within the study area. Adjacent but outside of the primary study area, Community Board 7 is preparing a 197-a community plan for the Sunset Park area that is currently in the outreach phase. The plan addresses future park sites and other community proposals. Submittal of the draft plan is expected in early 2003.

2. 1969 Plan for the City of New York

Descriptions of, and recommendations for, Community Planning Districts within the study area had been prepared as part of the 1969 *Plan for the City of New York* (boundaries of these Community Planning Districts differ from current Community District boundaries). Transportation issues identified in the 1969 plan included:

- the lack of transit access for residents living north of Dyker Park, traffic congestion on the Shore Parkway, and the presence of truck traffic on local streets in Community Planning District 10;
- the need for safety improvements under the elevated subway and the need to alleviate traffic congestion and add public parking along the 86th Street corridor, Bay Parkway and 18th Avenue in Community Planning District 11;
- access to Prospect Expressway from local streets and Ocean Parkway, visual/safety/noise problems associated with elevated subway lines on the BMT and IND lines on New Utrecht and MacDonald Avenues, and complicated/unsafe traffic patterns due to the diagonally running New Utrecht Avenue in Community Planning District 12;
- intermodal connections and access to and parking for beach visitors in Community Planning District 13;
- the need for extension of the Nostrand Avenue subway down Flatbush Avenue to Avenue W and the need for off-street parking for commercial areas in Community Planning District 14;
- bus service improvements to Kingsborough Community College in Community Planning District 15; and,
- the need for then-planned subway extensions in Community Planning District 18, including the above-mentioned Nostrand Avenue Line extension, and a new spur off the IRT New Lots Line extending down Utica Avenue to Flatbush Avenue and Avenue U.

3. Community District Needs Statements

The Community District Needs Statements for Brooklyn Community Boards (Fiscal Year 2001, New York City Department of City Planning) highlights concerns and proposed transportation projects of local community boards. Issues and proposals for the study area include the following:

- **Community District 10.** Community Board 10 recommends addressing neglected maintenance of roadways; the need for off-street parking (and the study of angled parking), the need to control the proliferation of curb cuts and increased abuses of valet parking in commercial areas; the need for coordination of roadway construction activities; the continued restoration of the 69th Street Pier (including beautification); the replacement of old street signs, school crossing signs and truck route signs; the need for comprehensive surveys of traffic and management systems to alleviate congestion and improve roadway safety; reconstruction of the 5th Avenue corridor; and provision of traffic control agents during roadway construction projects.
- **Community District 11.** Community Board 11 recommends street surveys and capital improvements; creation of access for approximately six houses on the westbound service road of the Belt Parkway and Bay Parkway; provision of a milling machine to eliminate ponding and flooding conditions; and the need for additional personnel in the Arterial Highway division to address weeds and litter alongside area highways.
- **Community District 12.** Community Board 12 recommends street resurfacing, reconstruction of curbs, mall rehabilitation and state-of-the-art traffic controls along Ocean Parkway; the need for the reconstruction, redesign, new street lighting, trees and modernization of Thirteenth Avenue and MacDonald Avenue (with removal of obsolete trolley tracks); the addition of a parking facility; replacement of traffic control signs and street signs; and better management of highway contractor performance.
- **Community District 13.** Community Board 13 recommends a comprehensive study of traffic impacts and pedestrian-vehicular conflicts; addressing illegal parking on Cropsey Avenue, Neptune Avenue and Stillwell Avenue; the need for a traffic signal at the dangerous intersection of West Avenue and West 5th Street; and the need to rebuild the West 8th Street overpass/bridge (linking West 8th Street, F Train and New York Aquarium).
- **Community District 14.** Community Board 14 recommends better coordination of capital projects; restoration of Highways and Traffic Operations Bureau staff and equipment; better management of traffic and transportation systems in commercial districts; continuation of sidewalk façade improvement programs for commercial streets; sidewalk/curb repairs to enhance access for seniors, children and the disabled; provision of additional off-street parking in commercial areas such as Avenue J and Coney Island Avenue; control of illegal curb cuts; improved maintenance of subway stations; restoration of protective fences along the Brighton Line right-of-way; and addressing sanitation and security concerns with re-fencing and erosion repairs along the New York and Atlantic Railway (LIRR) cut.
- **Community District 15.** Community Board 15 recommends redevelopment of Sheepshead Bay by providing additional parking, including multi-level parking; reconstruction of Dooley Street, East 23rd Street, and East 29th Street; reconstruction of Emmons Avenue; the need for curb replacement and maintenance and repairs of arterial highways, including periphery fencing.

- **Community District 17.** Community Board 17 recommends street reconstruction; truck enforcement on local streets; addressing traffic congestion on Church Avenue, Bedford Avenue, Nostrand Avenue, Flatbush Avenue, Utica Avenue, Glenwood Road, Linden Boulevard, Remsen Avenue; the need for a comprehensive study of traffic at intersections, which leads to air quality problems; reconstruction of curb cuts to meet the needs of the disabled and physically challenged; the need for paving of Ditmas Avenue; and addressing double parking problems, such as near Ralph Avenue between Remsen Avenue and Church Avenue.
- **Community District 18.** Community Board 18 recommends street resurfacing, reconstruction and repairs, particularly in southern portions of the district; street and sewer reconstruction in Canarsie; and having the City assume jurisdiction over private unmapped streets so that they can be improved (e.g., Varkens Hook Road, Preston Court and a portion of East 100th Street).

4. Waterfront Plans

The New York City Department of City Planning's 1994 Plan for the Brooklyn Waterfront includes detailed descriptions of three "Reaches," or waterfront portions of the borough, that fall within the Southern Brooklyn study area. For these areas, the plan describes actions to achieve goals related to the City's Comprehensive Waterfront Plan of 1992.

The Brooklyn Lower Bay (Reach 15) covers the western half of the Southern Brooklyn TIS study area waterfront and runs along the edge of the Bay Ridge, Bensonhurst and Gravesend neighborhoods. It contains concentrations of parkland and public uses, although these waterfront portions are generally separated from their upland communities by the Belt Parkway. The Reach 15 recommendations include upgrading the 69th Street Pier, providing additional access points to the Shore Road Esplanade, developing the Denyse Wharf as a recreational node at the foot of the Verrazano-Narrows Bridge, extending the Shore Road bicycle path to improved recreational facilities at Dreier-Offerman Park, providing additional upland connections, such as at Bay Parkway and at Bay 44th Street, improving ferry service from the 69th Street Pier with improved bus connections, retaining manufacturing zoning in most of Gravesend Bay to retain and attract industrial uses and low-traffic generating commercial uses, improving the safety and efficiency of traffic movement in the Gravesend Bay area, and fostering mixed use and residential development north and south of Dreier-Offerman Park.

Reach 16 covers the Southern Brooklyn waterfront from Sea Gate to Gerritsen Beach. While it includes much of Coney Island – portions of which are covered by the Coney Island – Gravesend Sustainable Development Transportation Study – the plan for Reach 16 includes recommendations for Sheepshead Bay including redevelopment of vacant sites, improving access to parking, esplanade improvements and revisions to special purpose district zoning to enhance the fishing piers of Sheepshead Bay and strengthen the area's traditional waterfront functions. Specific recommendations call for increased bicycle access, developing an entryway and parking area for the Plum Beach section of Gateway National Recreation Area, improving street and visual access in Gerritsen

Beach, improving parking in Sheepshead Bay, integrating a proposed ferry landing at Knapp Street with public access improvements, amending the Special Sheepshead Bay District zoning text to enhance urban design elements, and redeveloping the Dooley Street/East 21st Street site in Sheepshead Bay with a mix of uses including restaurants, retail and parking.

Reach 17 covers the Jamaica Bay and Rockaway portions of the Brooklyn waterfront with their intact natural ecosystem complexes and extensive parkland. Within the Southern Brooklyn study area, it includes the Marine Park, Mill Basin, Paerdegat Basin, Canarsie, Fresh Creek and Spring Creek waterfronts. The focus of the plan's recommendations for Jamaica Bay is balancing protection of this area's natural resources with economic opportunities and redevelopment, and mitigating pollution from non-point sources such as roads that surround the Bay. Specific recommendations relevant to the TIS study area include designating Jamaica Bay as a Special Natural Waterfront Area, limiting dredging to maintenance of existing channels, protecting wetland areas from illegal dumping, creating a Paerdegat Basin Natural Area Preserve to protect habitat and provide continuous public access, mapping as parkland and undertaking the de-mapping of unbuilt streets in the area of Spring Creek containing Old Mill Creek, and identifying areas of Jamaica Bay for additional boat launch sites, including at Paerdegat Basin.

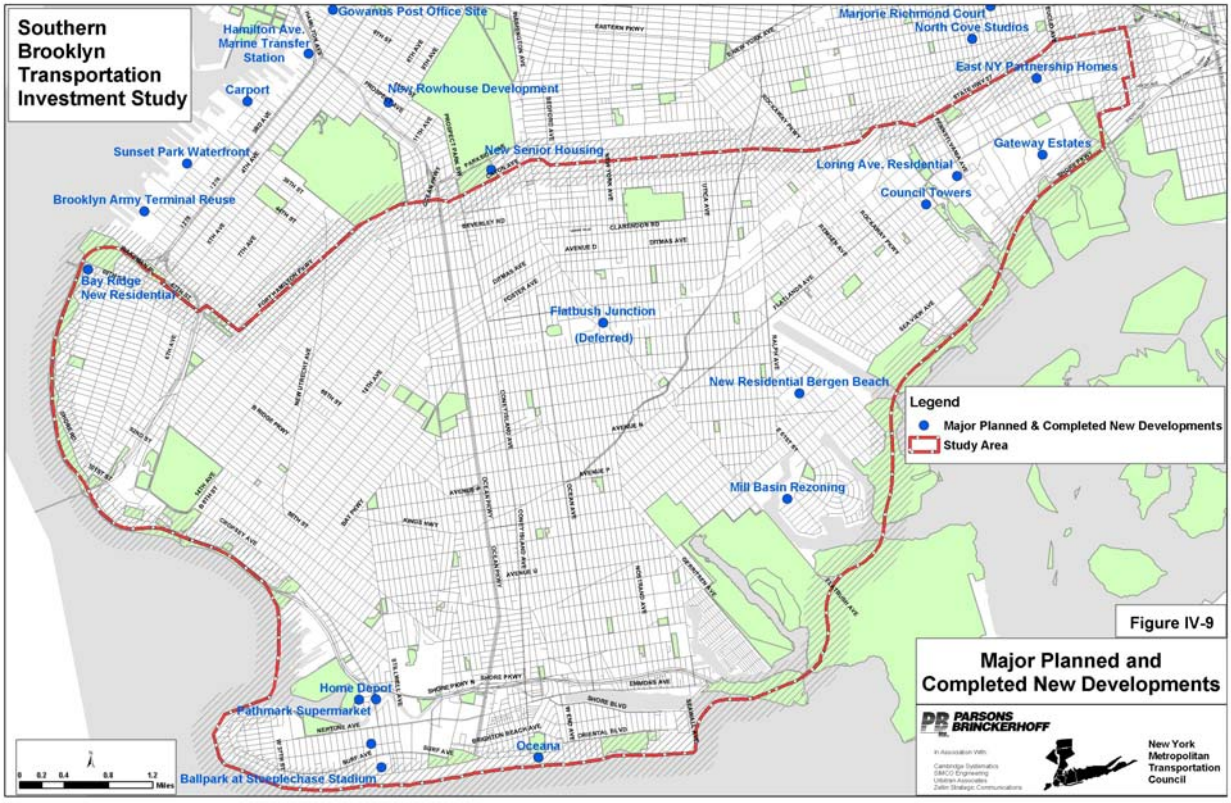
5. Other Plans

The New York City Department of Transportation is currently conducting a study of the Coney Island and Gravesend areas to address growing traffic problems in these communities and address development issues. The Coney Island-Gravesend Sustainable Development Transportation Study, which is being coordinated with the TIS, is intended to increase multimodal connectivity, mass transit usage and other transportation alternatives while encouraging sustainable growth and enhancing quality of life. The study area is bounded by Coney Island Avenue to the east, Riegelmann Boardwalk to the south, Kings Highway to the north and Bay Parkway/37th Street to the west. While the study area overlaps with that of the TIS, the Coney Island-Gravesend Sustainable Development Transportation Study focuses primarily on short term transportation improvements in conjunction with land use, whereas the TIS is concerned primarily with medium and long term transportation issues.

I. DEVELOPMENT ACTIVITY

The Southern Brooklyn waterfront is also the focus of much of the development activity recently completed, currently planned or underway in the primary study area. (See Figure IV-9, Major Planned and Completed New Developments.) This includes a mix of large-scale retail, sports and entertainment related uses, and residential uses. The focus on waterfront areas reflects the availability of both large sites and residential amenities. According to the New York City Department of City Planning and other agencies involved with housing and economic development, nearly 5,000 units of new housing are planned or currently in construction throughout the study area, along with approximately 1.97 million square feet of retail use.

FIGURE IV-9
MAJOR PLANNED AND COMPLETED NEW DEVELOPMENTS



Recently completed, planned or ongoing retail development in or near the study area includes three major developments. Home Deport has completed a 170,000 square-foot hardware/home supplies store at Bay 53rd Street, Bay 56th Street and West 22nd Street. The retail component of Gateway Estates, a phased, mixed-use development with 457,000 square feet of retail, was opened in October 2002. The project includes a new interchange at the Shore Parkway in East New York. Flatbush Junction, a shopping center proposed for a site near the terminus of the No. 2 and No. 5 IRT Line, is on hold, although it has received approvals and is anticipated in the future. Other non-residential projects include a newly completed 650-seat public school (PS 69), located at 9th Avenue between 63rd and 64th Streets. Coney Island's Keyspan Stadium, home of the Brooklyn Cyclones, is a 6,500-seat Minor League Baseball Stadium completed in 2001. The 1999 Environmental Impact Statement for the project indicated the potential for traffic impacts at W. 19th, W. 20th, W. 21st and W. 22nd Streets on Coney Island. The inducement of secondary development was expected to include increased numbers of patrons for area restaurants, retail and entertainment attractions. This project, and the recent opening of the Gateway Estates Shopping Center, one of Brooklyn's largest retail developments, with a total of 1,700 employees, are indications of an upswing in investment in the southern portions of the TIS study area.

Planned residential developments in the TIS primary study area include a mix of townhomes, condominiums and large-scale apartment complexes. The largest is the 2,385-unit residential component of Gateway Estates, located north of the Shore Parkway in the eastern portion of the study area in Community District 5. Six hundred small homes for low-moderate income households are to be constructed starting in 2004 through New York City Department of Housing Preservation and Development's Nehemiah Homes program, with the remaining 1,700 units to be built over the long term, though the type of housing for the remaining units is yet to be determined.[9] The second largest residential development in the area is Oceana, an 850-unit condominium development located on Coney Island. Three hundred and fifty units are expected to be completed at Oceana by the end of 2002, with an additional 500 also planned. A total of 368 units of Federally subsidized senior housing have recently been built in Community District 5 under the Section 202 housing program (Council Towers II, III, and IV). In Mill Basin, a 40-unit townhome complex and a 98-unit senior assisted living complex are also planned. The eastern end of the study area is expected to see a number of townhouse and moderate-income homeownership developments over the next five years, and others are planned just north of the primary study area.[10]

Table IV-9 lists the major recently completed, planned or ongoing developments within the Southern Brooklyn study area.

9 New York City Department of Housing Preservation and Development, Telephone Interview, Marshall Smith, 2002.

10 New York City Department of City Planning, 2002.

TABLE IV-9
RECENT AND PLANNED DEVELOPMENT ACTIVITY
WITHIN THE VICINITY OF THE SOUTHERN BROOKLYN STUDY AREA

PROJECT	LOCATION	TYPE	BUILD YEAR	UNITS	SIZE (Sq. Ft.)
RETAIL					
Home Depot	Bay, 53rd St., Cropsey Ave.	Big Box Retail	2001		170,000
Flatbush Junction	Ave. H, Flatbush, Nostrand Ave.	Shopping Center	NA		457,000 (may be scaled back)
Gateway Estates	Flatlands, Fountain, Shore Pkwy	Mixed Use (see residential below)	2002		640,000
Kings Plaza Expansion	Avenue U and 55th St.	Lowe's Hardware, Restaurant, Movie, Theater	2004		117,000 518 parking spaces
Sun Oil Site	Avenue U and Pearson St.	Lowe's Hardware Expansion	NA		50-100,000
Venice Marina Redevelopment Project	Sheepshead Bay, Knapp Street, Emmons Ave., Shell Bank Ave.	Retail/Marina with Waterfront promenade	2006		400,000+
Kings Highway Development	East 14th Street and East 15th Street, north of Kings Highway	Retail and Parking Garage	2006		87,000
Sheepshead Bay United Artists Theaters	Sheepshead Bay	Movie Theater	2003		NA
RESIDENTIAL					
New Construction	1426C Loring Street	2-3 Family Townhouse	2002	63	
New Construction	1426 Loring Ave.	2-3 Family Townhouse	2002	65	
Oceana	Brighton Beach Ave.	Condominiums	2002 – 2006	850	
Council Towers II, III, IV	99 Vandalia, Penn., Louisiana	Senior 202	2000	366	
Mill Basin	Flatbush, U, 64th, Mill, Strickland	Senior 202 Assisted Living	2001 – 2002	98	
Gateway Estates	Flatlands, Fountain, Shore Pkwy	UDAAP Mixed Use Nehemiah Homes	2009	2,385	

PROJECT	LOCATION	TYPE	BUILD YEAR	UNITS	SIZE (Sq. Ft.)
East New York New Foundations	Various CD 5 Sites	Moderate, Middle Income	2005	327	
Partnership or New Foundations	South of New Lots Avenue	Townhouse Homeownership	2006	162	
Partnership Housing	Various CD5 Sites	Homeownership	NA	52	
Bergen Beach/ Georgetown New Residential	Bergen Beach/Georgetown	2-Family	2004	300	
Ocean Dreams	Surf Ave. W. 35th-W. 37th St.	Residential Rezoning	2005	273	
OTHER					
Keyspan Stadium & Park	Surf Ave., W17 & W19 St.	7500 Seat Stadium 1200 parking spaces	2001		
P.S. 69	9th Ave., 63rd - 64th St.	650-Seat Public School	2002		
Yeshiva	McDonald Avenue, Avenue Y	1,000-Seat Religious School	NA		
Southwest Brooklyn Marine Transfer Station	Shore Parkway at Bay 41st St.	NYC Department of Sanitation Marine Transfer Station	2006		

Source: Brooklyn Office New York City Department of City Planning, New York City Economic Development Corporation, New York City Department of Housing Preservation & Development, Brooklyn Borough President's Office, September 2003.

Parks now planned in the study area include future greenways, and reuse of former landfill sites abutting Fresh Creek, Hendrix Creek and Old Mill Creek (Pennsylvania Avenue Landfill and Fountain Avenue Landfill). These projects are now in the planning stage while remediation of hazardous wastes at these sites is being completed. Some community members have called for increased access to these sites from inland areas.

Development activity anticipated elsewhere in the borough that may potentially affect through traffic patterns in the study area includes major new office development expected in Downtown Brooklyn, located several miles north of the Southern Brooklyn study area. The 9 MetroTech Center South is expected to be completed in 2003 and will have 670,000 square feet of office space. Over the long term, Downtown Brooklyn – already a major civic hub and office center – is expected to become a major sub-regional Central Business District and cultural center. Although not yet planned, approximately nine million square feet of commercial development and three million square feet of residential development could potentially be facilitated in the long term by rezoning

actions associated with the Downtown Brooklyn Redevelopment project. Within the next ten years, it is projected that over 3.5 million square feet of commercial development, and nearly 1.25 million square feet of residential development may be developed through this initiative in the vicinity of the MetroTech complex, which already contains over six million square feet of Class A office space. Such growth could potentially increase demand on major arterials in and near the Southern Brooklyn study area, such as Flatbush Avenue, McDonald Avenue, and the Gowanus Expressway, with workers expected to come primarily from the surrounding region rather than from the immediate vicinity of MetroTech. The project will also result in increased transit demand and increased truck deliveries. Other areas of Brooklyn that are expected to see growth include the district around the Brooklyn Academy of Music, where cultural uses such as theaters, as well as residential development, are planned. Separately, a 400,000 square-foot retail mall and over 400 units of housing are planned to be completed in 2004 as part of the Atlantic Terminal project. The Arverne Urban Renewal Project, located between Beach 84th Street to Beach 32nd in Rockaway Queens, is expected to result in 3,900 units of housing and 770,000 square feet of commercial development by the year 2009.

TABLE IV-10
MAJOR PLANNED AND ANTICIPATED DEVELOPMENT ACTIVITY
ELSEWHERE IN BROOKLYN*

PROJECT	LOCATION	TYPE	BUILD YEAR	UNITS	SIZE (Sq. Ft.)
OFFICE					
9 MetroTech Center South[3]	Downtown Brooklyn (Flatbush Ave. and Myrtle Ave.)	Office	2003		670,000 272 space garage
Downtown Brooklyn Rezoning	Bounded by Tillary St., Ashland Ave. & Atlantic Ave.	Commercial, Residential & Community Facility	2014		4,700,000 (See resid. below)
Empire State Dev. Corp.	Schermerhorn between Hoyt & Smith St.	Mixed Use/Mixed Income Residential	2004		40,000 Office or community facility or hotel (See below)
New State Courthouse	Tillary Street and Cadman Plaza East (330 Jay St.)	Family and Supreme Court (6,000 daily users)	2005		170,000 (See other components below)
Atlantic Court	Atlantic Avenue and Court Street	Mixed Use: Office, Retail, Community Facility (CF)	2004	327	509,000 office 22,000 retail 43,000 CF
Atlantic Terminal Mall	Atlantic Ave., Fourth Ave. and Flatbush Ave.	Bank of New York Office	2004		500,000 LIRR station rehab.
RETAIL					
Atlantic Terminal Mall	Atlantic Ave., Fourth Ave. and Flatbush Ave.	Retail	2004		470,000 LIRR station rehab.
Empire State Dev. Corp.	Schermerhorn between Hoyt & Smith St.	Mixed Use/Mixed Income Residential	2004		65,000 retail (See resid. Component below)
IKEA	Columbia and Halleck Streets	Retail	2006		346,000 Retail furniture store; 25,000 retail & 1,440 parking spaces

PROJECT	LOCATION	TYPE	BUILD YEAR	UNITS	SIZE (Sq. Ft.)
Greenpoint Williamsburg Rezoning	Newtown Creek (n), Williamsburg Bridge (s) McGuiness Blvd. (e) East River (w)	Residential/Commercial	2014	See resid. above	200,000 commercial
BAM/LDC North	Ashland and Rockwell Place and Lafayette and Fulton Streets	Residential/Other	2013		10,000 retail and 451 space garage
Brooklyn Bridge Park	Piers 1-5 Brooklyn Heights	Mixed Use (Overall 1,500,000 Sq. Ft.)	2010		NA (hotel restaurant, marketplace) See other components below
Lowe's Gowanus Post Office Site	2nd Avenue between 10th and 12th St.	Hardware Store	2004		157,000 as-of-right hardware store
Renaissance Plaza	Jay Street	Office/282-room Hotel Expansion	2004		200,000 commercial and 282 rooms
Arverne URA (Queens)	Beach 84th Street to Beach 32nd Street, from Rockaway Freeway to Boardwalk	Mixed-Use Residential with Retail and Hotel	2009	3,900	770,000 Commercial (mostly retail) 200,000 Hotel
RESIDENTIAL					
Atlantic Terminal	Atlantic Ave., Fourth Ave. and Flatbush Ave.	Affordable Housing	1997-2004	417	
Downtown Brooklyn Rezoning	Bounded by Tillary St., Ashland Ave. & Atlantic Ave.	Commercial, Residential & Community Facility	2014	1,000	
Greenpoint Williamsburg Rezoning	Newtown Creek (n), Williamsburg Bridge (s) McGuiness Blvd. (e) East River (w)	Residential/Commercial	2014	7,000	
Empire State Dev. Corp.	Schermerhorn between Hoyt & Smith St.	Mixed Use/Mixed Income Residential	2004	440	See above for commercial and retail components
110 Livingston Street	Downtown Brooklyn	Market-rate Residential	2005	245	

PROJECT	LOCATION	TYPE	BUILD YEAR	UNITS	SIZE (Sq. Ft.)
Flushing Bedford Rezoning	Rutledge, Lynch, Middleton Lorimer, Marcy, Spencer, Flushing, Myrtle, Wallabout, Franklin & Kent	Residential/Mixed-use rezoning	2010	1,224	
West Bushwick URA	Flushing Ave., Evergreen Ave., Jefferson St., Bushwick Ave. and Beaver St.	Townhouses and Mid-rise Affordable Housing	2007	460	
Kedem Winery Rezoning	Kent Ave. & S.8th St.	Residential rezoning	NA	410	
Pacific Street Rezoning	Carlton, Bergin, Vanderbilt & Pacific St.	Residential rezoning		400	
Kent Avenue Rezoning	Kent & Wythe Ave bet. South 8th & 11th St.	Residential rezoning		540	
CD 6 Rezoning/Park Slope	Warren, Union Sts, 3rd, 4th Aves., Prospect Park W.	Residential rezoning	2012	1,135	
Edgemere URA	Beach 35th Street to Beach 51st Street, from Rockaway Freeway to Jamaica Bay	Townhouses	2009	700	
OTHER					
Downtown Brooklyn Rezoning	Bounded by Tillary St., Ashland Ave. & Atlantic Ave.	Commercial, Residential & Community Facility	2014		300,000 Community facility
New Federal Courthouses	Tillary Street and Cadman Plaza East (25 Cadman Plaza East)	Courthouse	2003		700,000
New State Courthouse	Tillary Street and Cadman Plaza East (330 Jay Street)	Family and Supreme Court (6,000 daily users)	2005		780,000 with 150-space garage
New Brooklyn Polytech Dormitory	Downtown Brooklyn	400-bed Dormitory	2002		
Brooklyn Law School Dormitory	Downtown Brooklyn State St. & Boerum Place	371-bed Dormitory	2004		With 212 space garage
New York Marriott Expansion	Adams St, north of Willoughby St.	Hotel rooms	2005	280	Hotel and additional 8,500 retail

PROJECT	LOCATION	TYPE	BUILD YEAR	UNITS	SIZE (Sq. Ft.)
Brooklyn Bridge Park	Piers 1-5 Brooklyn Hts.	Mixed Use	2010		70-acre park including 1,500,000 of cultural & educational facilities, hotel, marketplace, restaurant, open and recreational spaces.
BAM/LDC North	Ashland and Rockwell Place and Lafayette and Fulton Streets	Residential/Other	2013		160,000 museum and gallery; 50,000 theater; 43,000 dance center
Navy Yard	East River waterfront, Williamsburg/Fort Greene/Vinegar Hill	Movie Production Studio with office space	2004		275,000 with later undetermined phases
Brooklyn Army Terminal	58th St. and 1st Ave.	Back Office/Light Industrial reuse	NA		1,000,000
Greenpoint Marine Transfer Station (NYCDOS)	N. Henry and Kingsland Ave.	NYCDOS Marine Transfer Station	2006		
Hamilton Avenue Marine Transfer Station (NYCDOS)	Second Ave./Gowanus Canal	NYCDOS Marine Transfer Station	2006		

Source: Brooklyn Office New York City Department of City Planning, New York City Economic Development Corporation, New York City Department of Housing Preservation & Development, Brooklyn Borough President's Office, September 2003.

Chapter V: Environmental Conditions

A review of existing environmental impact statements prepared for recent projects in the TIS study area was conducted, along with a review of various agency data in order to assess environmental conditions within the TIS study area. Environmental issues for consideration in the development and evaluation of alternative transportation improvements include types and locations of community facilities, sensitive land uses, cultural resources, visual resources, air quality, noise, vibration, natural resources, hazardous materials and the locations of minority, low income and disabled populations for environmental justice considerations. The following sections inventory existing conditions and future anticipated conditions related to these issues.

A. SENSITIVE LAND USES

Environmental impacts affect different types of land uses to differing degrees. For instance, visual conditions are more of a concern for residential areas, parks, historic districts and other areas where quality of life is a critical concern, as opposed to business or industrial areas. Air quality impacts, on the other hand, are typically measured at receptor locations where the general public (or any significant segment thereof) is likely to have access. The Existing Land Use Map shows the locations of residential concentrations within the study area, as well as other sensitive land uses such as parks and community facilities. Future transportation improvements and operations will need to be designed in ways that minimize potentially adverse environmental impacts on these uses.

1. Residential Areas

With the exception of portions of its surrounding waterfront areas, the TIS study area is mostly developed. The majority of the study area consists of residential neighborhoods built at generally lower densities than the rest of the Borough of Brooklyn. Only in the vicinity of the Brooklyn Terminal Market are uses solidly non-residential, although some corridors, such as Cropsey Avenue, have concentrations of industrial uses. Some parts of the study area are relatively homogenous in their distribution of land uses. For instance, Gerritsen Beach and some of its surrounding neighborhoods have a consistent low-density residential character, whereas areas such as Borough Park and Spring Creek are much more mixed. Spring Creek contains a mix of industrial and residential uses, and has the highest degree of vacant lots in the study area.

While the majority of the study area's housing stock is comprised of low-scale single-, two- and three-family homes, multi-family housing is interspersed throughout the study area and is concentrated along corridors such as Ocean Avenue, Nostrand Avenue, 4th Avenue, and Coney Island Avenue. The area south of Prospect Park, portions of Coney Island west of Ocean Parkway, and Starrett City also contain multi-family housing, both in mid-rise, high coverage apartment complexes, and in apartment towers such as Starrett City. New York City Housing Authority housing complexes contain some of the highest residential densities in the study area.

FIGURE V-1
MAJOR HOUSING DEVELOPMENTS

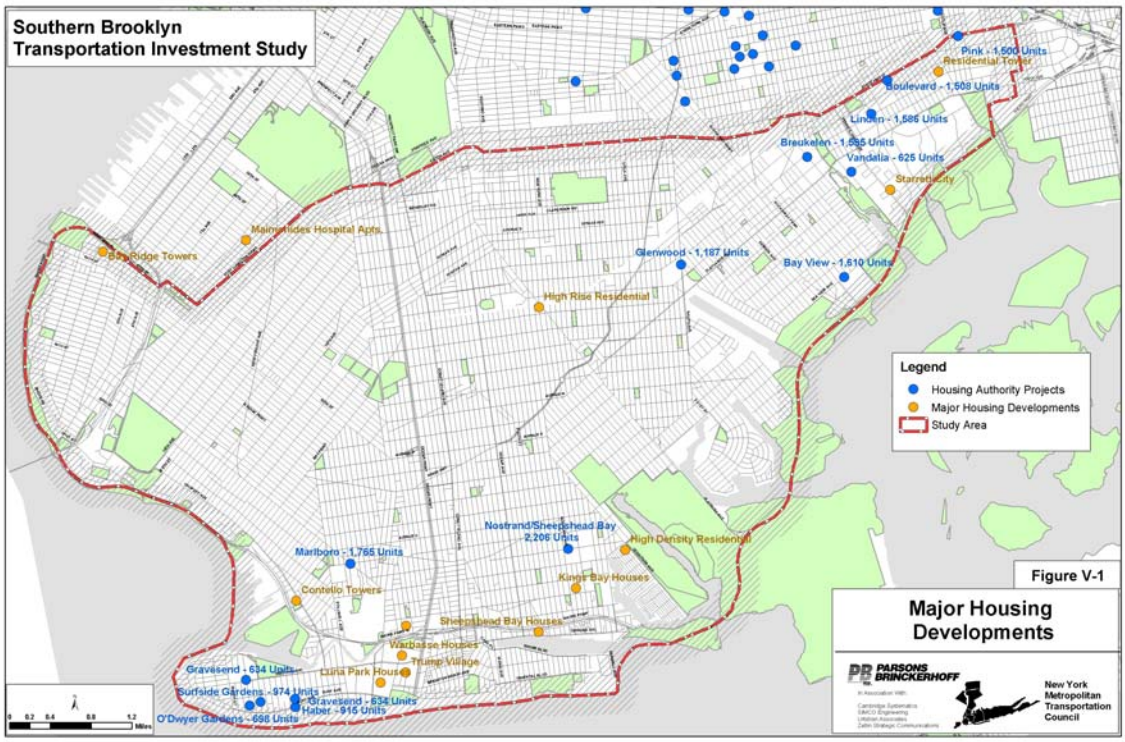


Table V-1 lists the Housing Authority complexes in the study area, their management office address and their number of units. (See Figure V-1, Major Housing Developments.)

TABLE V-1
NEW YORK CITY HOUSING AUTHORITY DEVELOPMENTS IN STUDY AREA

Development	Address	Units
Bay View	9820 Seaview Avenue	1,610
Belmont-Sutter Area	812 Ashford Street	72
Boulevard	812 Ashford Street	1,436
Breukelen	618 East 108th Street	1,595
Carey Gardens	2955 West 24th Street	674
Coney Island	2410 Surf Avenue	535
Coney Island Carey gardens	2955 West 24th Street	193
Coney Island O'Dwyer Gardens	2959 West 33rd Street	125
Coney Island Surfside Gardens	2940 West 31st Street	377
Cypress Hills	600 Euclid Avenue	1,442
East New York City Line	600 Euclid Avenue	63
Glenwood	1660 Ralph Avenue	1,187
Gravesend	2793 West 33rd Street	634
Haber	2410 Surfside Avenue	380
Linden	914 Van Siclen Avenue	1,586
Marlboro	2740 86th Street	1,765
Nostrand	2955 Avenue W	1,148
O'Dwyer Gardens	2959 West 33rd Street	573
Pennsylvania Avenue-Wortman Avenue	17 Vandalia Avenue	336
Pink	2632 Linden Boulevard	1,500
Ralph Avenue Rehab	728 New York Avenue	118
Sheepshead Bay	2955 Avenue W	1,058
Surfside Gardens	2940 West 31st Street	597
Vandalia Avenue	17 Vandalia Street	289

Source: New York City Housing Authority

Recent changes to area land use patterns have included the development of remaining waterfront sites for both residential and retail development. Commercial areas such as 86th Street have seen a transition from smaller mom-and-pop-type retailers to large chain store type retailers. Big box retail is also increasing in the area, with stores such as Home Depot, and mall-type retailers within Gateway Estates. Some residential areas have seen additional development at higher densities, affecting the availability of on-street parking and increasing demand on transportation and certain community services and facilities. New condominium type residences have emerged along waterfront areas.

2. Community Facilities

Figure V-2, Community Facilities, shows the locations of community facilities including schools (public and private), colleges, libraries, police stations, fire houses, correctional/court facilities, hospital and heath-related facilities, group homes, day care centers, adult/family homes, shelters and temporary housing, soup kitchens and centers,

and senior centers. Day care centers and other social service providers are of concern from the perspective of how transportation-related projects and initiatives could potentially impacts these sites and the clients that they serve. Others identified also represent major activity centers and traffic generators, such as hospitals and colleges. Kings County Hospital, SUNY Downstate Medical Center, Maimonides Medical Center, Victory Memorial Hospital, Brookdale Hospital and the Brooklyn Developmental Center are some of the largest health related facilities within the study area, all of which are heavily accessed by transit dependant populations. Colleges in the study area, which are also transit dependant, include Kingsborough Community College in Manhattan Beach on Coney Island and Brooklyn College. The Community Facilities map also shows concentration of certain facilities, including day care centers grouped along Church Avenue, for example, and high numbers of private (religious) schools in the Borough Park section.

3. Major Activity Generators

Major activity generators are listed Figure V-3, Table V-2 and Table V-3 (the first including those within the TIS study area, and the second including those major sites located elsewhere in Brooklyn). These sites include hospitals, colleges, major recreation, employment, retail and entertainment facilities, residential towers and other sites that generate or attract significant amounts of visitors. (See Figure V-3.)

B. CULTURAL RESOURCES

The portion of Brooklyn covered by the TIS primary study area contains a number of historic communities, some of which developed starting in the 17th century. Initial settlement of the area included villages of Lanape Native American Indians, including Canarsie, which derives its name from this earliest settlement period. Figure V-4, Archeological Sensitive Sites, shows generalized locations in the Borough of Brooklyn documented by the Historic Preservation Field Services Bureau of the New York State Office of Parks, Recreation and Historic Preservation. Archeologically sensitive sites are concentrated along the Bay Ridge and Dyker Heights waterfronts, and along waterfront areas and inlets facing Jamaica Bay.

The FGEIS for the Belt Parkway Bridges Rehabilitation Projects (1998) identified archeological resources within the vicinity of 10 bridges along the Belt Parkway. The Nostrand Avenue Bridge over the Belt Parkway is considered to be highly sensitive for prehistoric resources. The Paerdegat Bridge is considered to be moderately sensitive for prehistoric resources. The Stage 1A report done for the Bridges Rehabilitation GEIS indicates that the earliest evidence of prehistoric occupation in the area was found at the inventoried site at the head of Gerritsen Beach, where artifacts dating to the Transitional Archaic period (4,000 to 3,000 years before present) have been recovered.[1]

[1] *Stage 1A Cultural Resources Assessment, Belt Parkway Bridges Project*, Historical Resources, Inc., June 1997.

FIGURE V-2
COMMUNITY FACILITIES

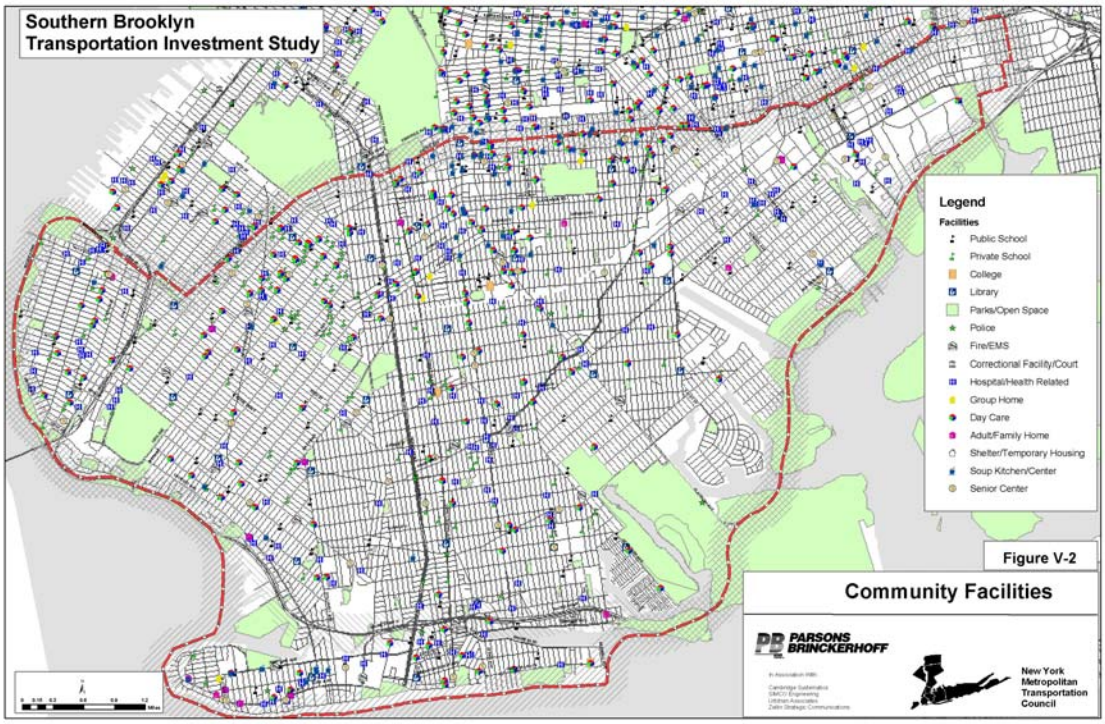


FIGURE V-3
MAJOR ACTIVITY GENERATORS

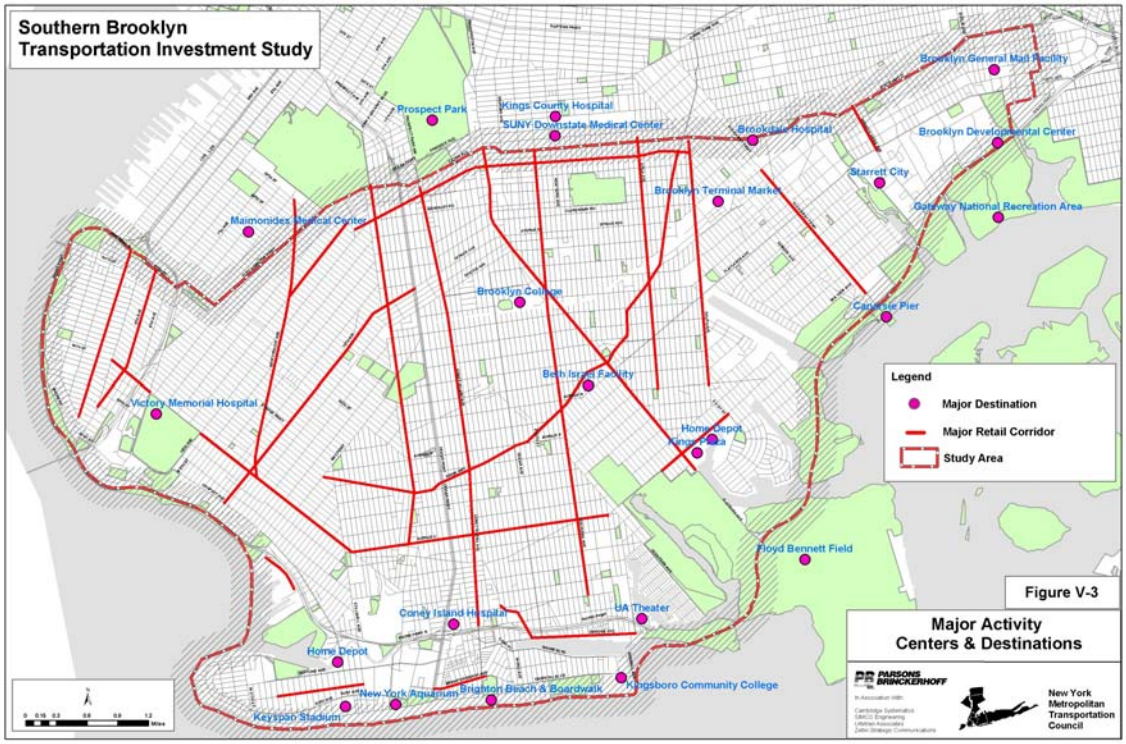


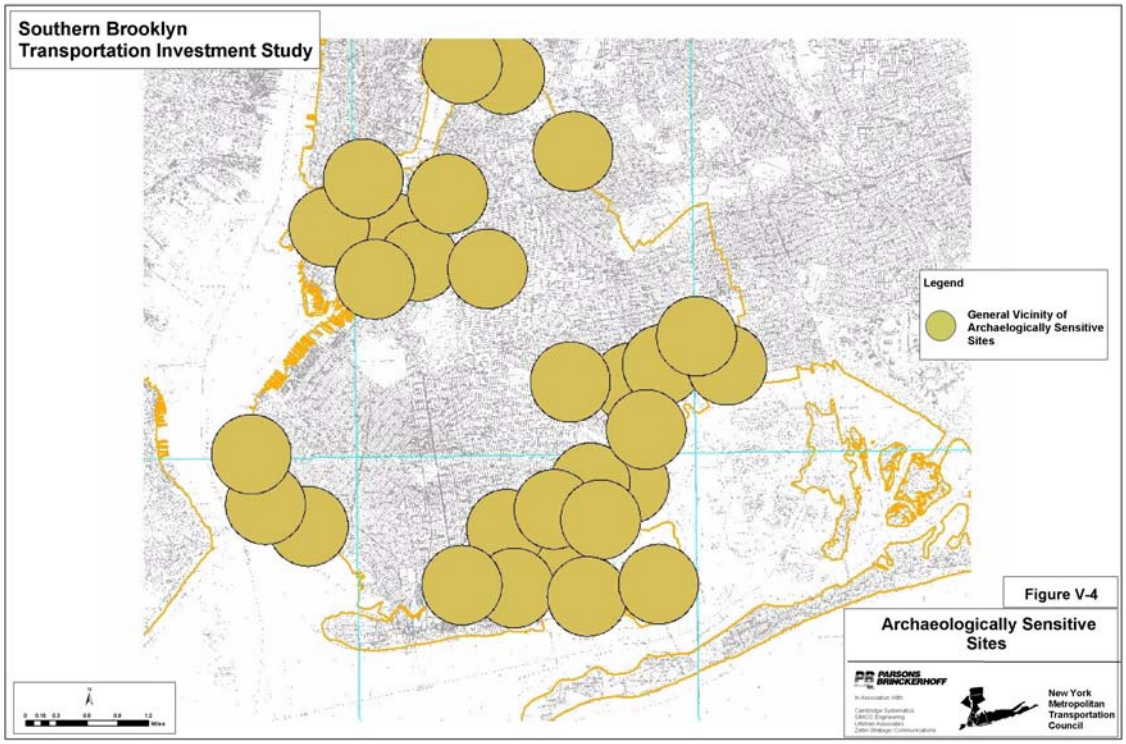
TABLE V-2
MAJOR ACTIVITY GENERATORS AND ATTRACTORS IN SOUTHERN BROOKLYN STUDY AREA

Site	Location
GOVERNMENT	
Brooklyn Central Mail Facility	
CULTURAL/ENTERTAINMENT	
New York Aquarium	Surf Avenue/W. 8th Street
Keyspan Stadium & Park	Surf Ave., W. 17 & W. 19 Streets
Brighton Beach & Boardwalk	Coney Island
Gateway National Recreation Area	Jamaica Bay
Canarsie Pier	Jamaica Bay
COLLEGES/UNIVERSITIES	
Brooklyn College	Flatbush
Kingsborough Community College	Coney Island
HOSPITALS/HEALTH-RELATED	
Coney Island Hospital	Coney Island
Brookdale Hospital	Remsen Village
Kings County Hospital	East Flatbush
SUNY Downstate Medical Center	East Flatbush
Maimonides Medical Center	Sunset Park
Victory Memorial Hospital	Dyker Heights
Brooklyn Developmental Center	Spring Creek
Beth Israel Facility	Flatlands Ave./Ave. N
PARK	
Floyd Bennett Field	Jamaica Bay
OTHER	
Brooklyn Terminal Market	Remsen Village
Kings Plaza	Avenue U/Flatbush Avenue
Residential	
Starrett City	Pennsylvania Avenue
Peter Warbasse Houses/Tower	Coney Island
High Density Housing	Ave. U/Gerritsen Ave.
High Density 6-story housing	Shore Parkway/Gravesend
High Density Housing/Towers	Kings Highway/Ave. H
High Density Housing/Towers	Fountain Ave./Stanley Ave.
High Density Housing/Towers	4th/5th Ave.'s/9th Street

TABLE V-3
MAJOR ACTIVITY GENERATORS AND ATTRACTORS IN OTHER PARTS OF BROOKLYN

Site	Location
GOVERNMENT	
Borough Hall	Court Street/Joralemon Street
NYS Supreme Court	Downtown Brooklyn
NYS Criminal Court	Downtown Brooklyn
Family Court	Downtown Brooklyn
Federal Building	Downtown Brooklyn
CULTURAL/ENTERTAINMENT	
Brooklyn Botanical Gardens	Prospect Park
Lefferts Homestead	Prospect Park
Brooklyn Academy of Music	Lafayette Street
Brooklyn Public Library	Grand Army Plaza
Brooklyn Museum	Prospect Park
Brooklyn Children's Museum	145 Brooklyn Avenue
Transit Museum	Boerum Place
Arts of St. Ann's	Montague Street
Prospect Park Zoo/Wildlife Center	Prospect Park
Fort Hamilton/Harbor Defense Museum	Ft. Hamilton Parkway
COLLEGES/UNIVERSITIES	
Pratt Institute	215 Ryerson Street
Polytechnic University	333 Jay Street
NYC Technical College	300 Jay Street
Brooklyn Law School	250 Joralemon Street
St. Francis College	180 Remsen Street
Medgar Evers College	1150 Carroll Street
Long Island University	385 Flatbush Avenue
St. Josephs College	245 Clinton Avenue
HOSPITALS	
Methodist Hospital	Park Slope
PARKS	
Riis Park	Rockaway
LI College Hospital	Cobble Hill
Wyckoff Hospital	Bushwick
Woodhull Hospital	Bedford-Stuyvesant
Lutheran Hospital	Sunset Park
OTHER	
Brooklyn Army Terminal	1st Avenue/Sunset Park
Brooklyn Navy Yard	Kent Avenue
Metro Tech Center	Jay Street
LIRR Flatbush Terminal	Flatbush Avenue

FIGURE V-4
ARCHEOLOGICAL SENSITIVE SITES



Early towns that were established in the area were located along pathways used by Native Americans, including towns such as New Amersfoort, or Flatlands (1647), Flatbush (1652) and New Utrecht (1657). Settled in 1645, the Town of Gravesend was centered around a grid pattern plan from 1646, which represented one of the country's first planned communities. These early settlements were linked by one of New York City's earliest thoroughfares, Kings Highway, which followed the route of an earlier Indian trail.[2] The Pieter Claeson Wyckoff House, circa 1652, located at Clarendon Road and Ralph Avenue, is probably the oldest home in New York City, and was the first site to be designated as a New York City Landmark. This site, which is open to the public, was once in close proximity to salt marshes and clam beds used by the early settlers, including the Dutch settlement of New Amersfoort, of which it was part.[3]

By the mid-19th century, development in southern Brooklyn increased with land speculation occurring around railroad lines that extended to beach resorts in Coney Island and Canarsie, such as the Brooklyn, Canarsie and Rockaway Beach Rail Road; the Brooklyn, Flatbush and Coney Island Railway; and the Brooklyn, Bath and West End Railroad. Areas such as Bay Ridge (old Town of New Utrecht) were developed in the latter half of the 19th century with mansions for the wealthy, which were eventually replaced by the row houses and apartment buildings that now typify housing in much of the study area. The area's towns were annexed to the City of Brooklyn with construction of the elevated railways. The arrival of the subways, expansion of industry, immigration trends and suburbanization, particularly following the construction of the Verrazano

Narrows Bridge in 1964, all shaped the current built form of the area, its neighborhoods and its socioeconomic profile.[4] The opening of the Belt Parkway in 1940 also contributed to intensified residential development in Southern Brooklyn.[5]

The primary study area contains three designated New York City historic districts located south of Prospect Park. These include the Albemarle-Kenmore Terraces Historic District, located near Church and Flatbush Avenues, with its turn-of-the-century Georgian style row houses. Further to the west, the Prospect Park South Historic District contains Colonial Revival and other style single-family homes and mansions from the same period within a planned community setting. Another historic district of turn-of-the-century mansions is the Ditmas Park Historic District, located around Ditmas Avenue east of Ocean Avenue. Individual landmarks are interspersed throughout the primary study area, particularly in the Midwood, Flatlands, Sheepshead Bay, Gravesend, Bensonhurst, Bath Beach, Ditmas Park and Flatbush neighborhoods, with styles ranging from Colonial, Georgian/Federal and Gothic, Romanesque, Roman, and Renaissance Revival to Art Deco, Modern and Post-Modern. The following map and table show sites within the study area that are listed on the National Register of Historic Places. These include the Prospect Park South, Albemarle and Ditmas Park Historic Districts, located south of Prospect Park, and the Floyd Bennett Field Historic District (the Floyd Bennett

2 Jackson, Kenneth T. *The Encyclopedia of New York City*. Yale University Press, New Haven. 1995. pp. 148-152.
3 New York City Department of Parks and Recreation.
4 Jackson, Kenneth T. *The Encyclopedia of New York City*. Yale University Press, New Haven. 1995. pp. 148-152.
5 *Final Generic Environmental Impact Statement (FGEIS) for the Proposed Belt Parkway Bridges Rehabilitation Project*, HNTB/EBASCO, 1998.

Field Historic District is located within Gateway National Recreation Area and retains the layout and surface appearance of New York City's first municipal airport). Eight individual properties listed on the National Register of Historic Places are concentrated in the Ditmas Park and Flatbush communities and sites are located within the central and southern portions of the study area. Individual sites predominantly include a mix of religious sites – such as the Bay Ridge United Methodist Church, the Flatlands Dutch Reformed Church and the Old Gravesend Cemetery – and historic houses and homesteads such as the Wyckoff-Bennett Homestead, Hubbard House and the Lott House. Three sites are located on Coney Island, including the Parachute Jump and the Cyclone Roller Coaster. (See Figure V-5.)

The 1998 GEIS for the Belt Parkway Bridges Rehabilitation Project identified the Mill Basin Bridge over the Belt Parkway – an example of the Chicago type of moveable bridge that was designed in 1939 – as having features that make it eligible for listing on the State and National Register of Historic Places.[6]

Designated New York City individual Landmarks in the study area include the following (see Figure V-5):

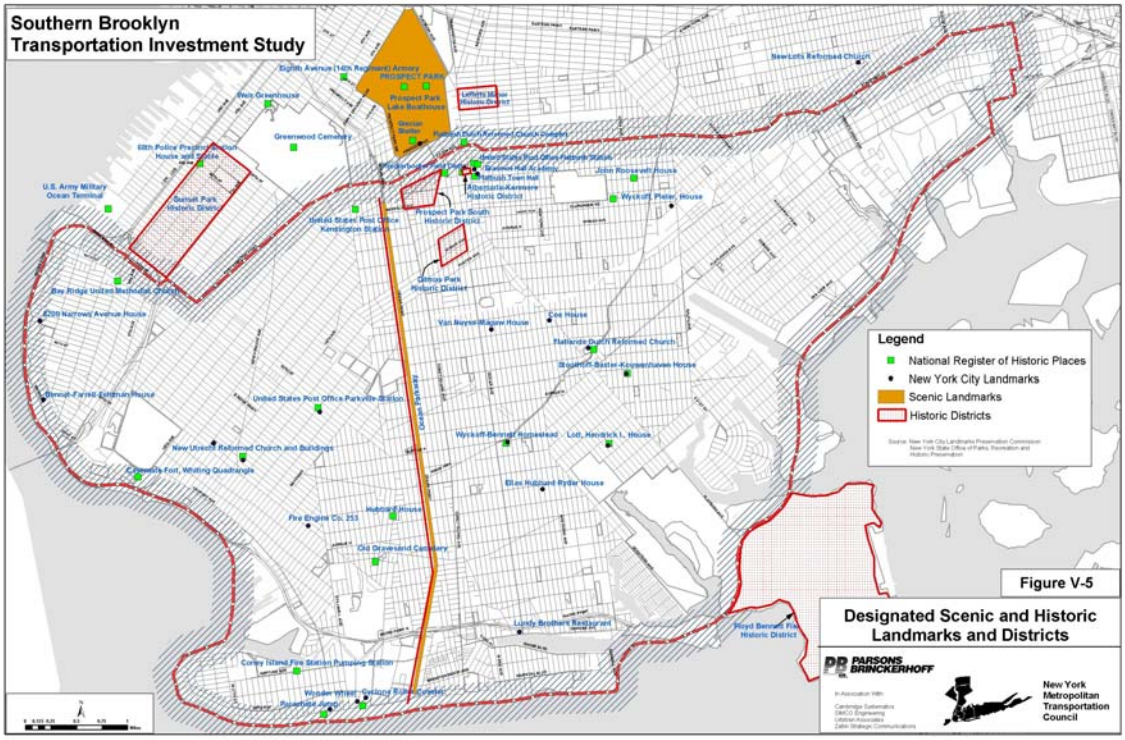
TABLE V-4
NEW YORK CITY DESIGNATED INDIVIDUAL LANDMARKS

New Lots Reformed Church
New Utrecht Reformed Dutch Church Cemetery
Fire Engine Company 253
Bennet-Farrell-Feldman House
Magen David Synagogue
Erasmus Hall Museum
Wyckoff-Bennett Homestead
Stoothoff-Baxter-Kouwenhoven House
Flatbush Town Hall
Flatbush Dutch Reformed Church Parsonage
8200 Narrows Avenue House
New Utrecht Reformed Dutch Church and Parish House
Flatbush Dutch Reformed Church
The Cyclone
The Wonder Wheel
Pieter Claesen Wyckoff House
The Grecian Shelter
Flatlands Reformed Church
Hendrick I. Lott House
F. W. I. L. Lundy Brothers Restaurant Building
The Parachute Jump
Elias Hubbard Ryder House
Coe House
Van Nuyse-Magaw House

Source: New York City Landmarks Preservation Commission, 2002.

6 Ibid.

FIGURE V-5
SCENIC HISTORIC LANDMARKS AND DISTRICTS



C. VISUAL RESOURCES

Visual resources within the study area generally include historic landmarks; natural and open space resources; views of waterfront areas such as Upper and Lower New York Bay, Gravesend Bay, the Atlantic Ocean and Jamaica Bay; housing and other built features that contribute to the distinct community character of the area's neighborhoods, visual landmarks such as the Verrazano-Narrows Bridge, and landscaping features such as street trees and median landscaping, such as along Ocean Parkway. The Shore Parkway, with its adjacent Esplanade and views of the waterfront and the Verrazano-Narrows Bridge, is a visual resource for its open space character and its historical function as a scenic pleasure drive. As highlighted by the New York City Department of Parks and Recreation, which maintains joint ownership and jurisdiction over the Parkway with the New York City Department of Transportation, the scenic and recreational functions of the Parkway rely on the green buffer space that separates traffic from pedestrians and cyclists, as well its adjacent parkland.

The character and scenic value of several areas within Southern Brooklyn are protected through land use regulations of the City of New York. The New York City Zoning resolution designates Special Purpose Districts for this reason. (Elsewhere in Brooklyn outside of the study area, a Special Scenic View District has been mapped for the area west of the Brooklyn Heights Esplanade to protect the waterfront views of the Lower Manhattan skyline, Governors Island, the Statue of Liberty and the Brooklyn Bridge. Prospect Park is a designated New York City Scenic Landmark.)

Within the study area, three Special Purpose Districts have been mapped for purposes that include protecting community character and enhancing scenic landmarks. A fourth Special Purpose District, the Special Coney Island Mixed Use District was established to stabilize residential development while protecting the area's industrial base. The three Special Purpose Districts intended to enhance visual quality and community character are the Special Ocean Parkway District, the Special Sheepshead Bay District and the Special Bay Ridge District, as described below.

1. Special Ocean Parkway District

The Special Ocean Parkway District generally includes the blocks located between McDonald Avenue and Coney Island Avenue between Fort Hamilton Parkway and Brighton Beach Avenue. The regulations are intended to strengthen the existing character and quality of the community and to enhance the scenic landmark designation of Ocean Parkway through landscaping provisions, limiting the bulk of permitted community facilities, and requiring enclosed parking for development along Ocean Parkway. The Special Ocean Parkway District regulations include special off-street loading regulations and tree planting and landscaping requirements within the required 30-foot front yard.[7] Ocean Parkway was envisioned in the 1860's by Frederick Law

[7] New York City Zoning Resolution.

Olmstead and Calvert Vaux, who designed plans for Ocean Parkway in the style of grand boulevards of Europe. Construction was completed in 1880.[8]

2. Special Bay Ridge District

The Special Bay Ridge District was established to protect the existing scale and character of the Bay Ridge community, with its distinct scale of development. Midblock street zones encourage two- and three-family homes up to three stories in height while the zoning of the avenues encourages rehabilitation and limits development to a six- to eight-story maximum. Also included are special setback, curb cut, open space, tree planting and ground floor commercial requirements.[9]

3. Special Sheepshead Bay District

The Special Sheepshead Bay District is intended to preserve the unique waterfront recreation and commercial character of Sheepshead Bay. For Emmons Avenue, the district's main thoroughfare, regulations require widened sidewalks, street trees and plazas containing sitting areas, landscaping, kiosks ad cafes. Additional accessory commercial parking is also encouraged.[10] Sheepshead Bay's distinct maritime character is enhanced by its waterfront esplanade, piers, restaurants, local fishing industry and recreational fishing facilities.

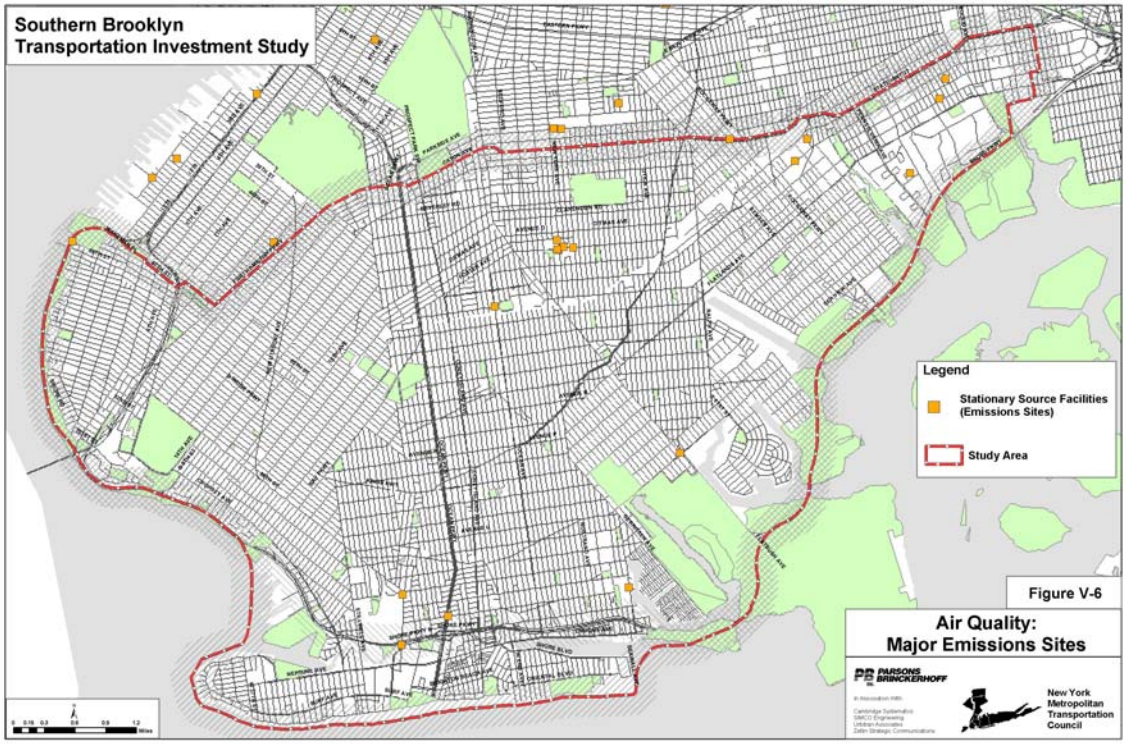
D. AIR QUALITY

Air quality in the study area can be affected by emissions generated by vehicular traffic and other moving sources; stationary emission sources, such as exhaust stacks from industrial operations (including those concentrated in areas such as New Lots and Spring Creek); and construction activities. Major stationary emission sources located within the study area are indicated in Figure V-6, Air Quality Emissions. These sites are primarily industrial facilities, heating plants associated with large housing complexes, and medical centers.

The following air pollutants have been identified by the U.S. Environmental Protection Agency (USEPA) as being of concern nationwide: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), lead (Pb), sulfur dioxide (SO_2), and particulate matter. In New York City, ambient concentrations of CO and O_3 are predominantly influenced by motor vehicle activity; NO_2 is emitted from both mobile and stationary sources; emissions of SO_2 are associated mainly with stationary sources; and emissions of particulate matter are associated with stationary sources, and to a lesser extent, diesel-fueled mobile sources (e.g., heavy trucks, buses, and trains). Lead emissions, which historically were principally influenced by motor vehicle activity, have been substantially reduced due to the elimination of lead from gasoline.

8 Jackson, Kenneth, T. Ed. T*he Encyclopedia of New York*, Yale University Press, 1995, p. 860.
9 New York City Zoning Resolution.
10 New York City Zoning Resolution.

FIGURE V-6
AIR QUALITY EMISSIONS



Relatively high concentrations of CO are typically found near congested intersections and along heavily used roadways carrying slow-moving traffic, and microscale mobile source analyses are usually required for proposed projects that are projected to increase or redistribute traffic. In New York City, several areas, including Downtown Brooklyn, have been identified as being of particular concern for mobile source air quality projects, and the thresholds for requiring air quality analyses for projects in these areas are lower than for projects in less congested areas.

As part of an initial assessment of air quality conditions in the study area, existing EIS's for recent projects within the STIS study area have been reviewed for air quality issues. Ambient air quality data for the study area were identified in the Environmental Impact Statement (EIS) for the New York Economic Development Corporation's Baseball Stadium at Steeplechase Park, including monitored concentrations of CO, particulates, NO_2, Pb, and O_3. This Coney Island project considered data collected by the New York State Department of Environmental Conservation at the following monitoring sites: Brooklyn Transit, PS 321, PS 314, Mabel Dean, Greenpoint and Queens College. There were no recorded violations in 1997 of applicable air quality standards at these sites or any other in New York City – with the exception of O_3, which is a regional pollutant for which the New York Metropolitan Region is considered to be a severe non-attainment area (*EIS for the Baseball Stadium at Steeplechase Park*, Allee King Rosen and Fleming, 2/18/00). Another air quality monitoring station has subsequently been added in Brooklyn at JHS 126, 424 Leonard Street. For 2001, none of the Brooklyn Monitoring Stations reported pollutant concentrations above a national air quality standard.[11]

Overall, the city's air quality is considered to be improving. Air quality analyses conducted for the Final Environmental Impact Statement (FEIS) for the New York City Comprehensive Solid Waste Management Plan Draft Modification indicate that existing background pollutant concentrations at two sites in and adjacent to the TIS study area (Southwest Brooklyn Modified MTS and 65th Street Enclosed Barge Unloading Facility) were within the applicable national and state ambient air quality standards. The FEIS also pointed out that air quality in the area is expected to be affected by increasingly stringent federally-mandated vehicular emission controls, offset by increases in regional traffic volumes.

According to the staff of the Brooklyn Borough President's Office, air quality-related concerns of South Brooklyn residents include proposed NYC Department of Sanitation (NYCDOS) Waste Transfer Stations and garages, particularly in the Gowanus Canal vicinity. Citizen complaints have been received regarding traffic and odor near the Atlas Rolloff facility, located at 941 Stanley Avenue, which processes petruscible waste. The EIS for the NYCDOS Comprehensive Solid Waste Management Plan indicated that the proposed Southwest Brooklyn MTS, located on the waterfront in Bensonhurst, would not significantly impact air quality in the surrounding area.[12]

11 U.S. Environmental Protection Agency, AirData, 2002.

12 Final Environmental Impact Statement for the New York City Comprehensive Solid Waste Management Plan Draft Modification, New York City Department of Sanitation, October 2000.

E. NOISE QUALITY AND VIBRATION

Like air quality, noise impacts are measured from three principle types of noise sources – mobile sources, stationary sources and construction sources. Community noise levels at any given time in urban areas such as Southern Brooklyn range from between 45 and 85 dBA (dBA is the weighted sound level expressed in units called A-weighted decibels). At the lower end of this range is the daytime noise level in a typical quiet living room while the higher end of the range includes approximate noise levels near a sidewalk adjacent to heavy traffic. Noise Exposure Standards used in New York City environmental reviews (CEPO/CEQR standards) define the acceptable general external noise exposure level for residences as being equal to or less than 65 dBA (one hour L_{eq}).

In general, the principle sources of noise in the study area are motor vehicles on local roads and general community activities. Keyspan Stadium and area amusement parks generate significant noise levels during hours of operation, while traffic and noise from elevated trains impact uses near area transportation corridors. The *Final Generic Environmental Impact Statement (FGEIS) for the Proposed Belt Parkway Bridges Rehabilitation Project* (HNTB/EBASCO, 1998) stated that, "in terms of New York City CEPO-CEQR standards, existing noise levels at all [bridge] sites are in the "marginally unacceptable" category for the time periods measured," which might be considered to be a nuisance for residential areas.

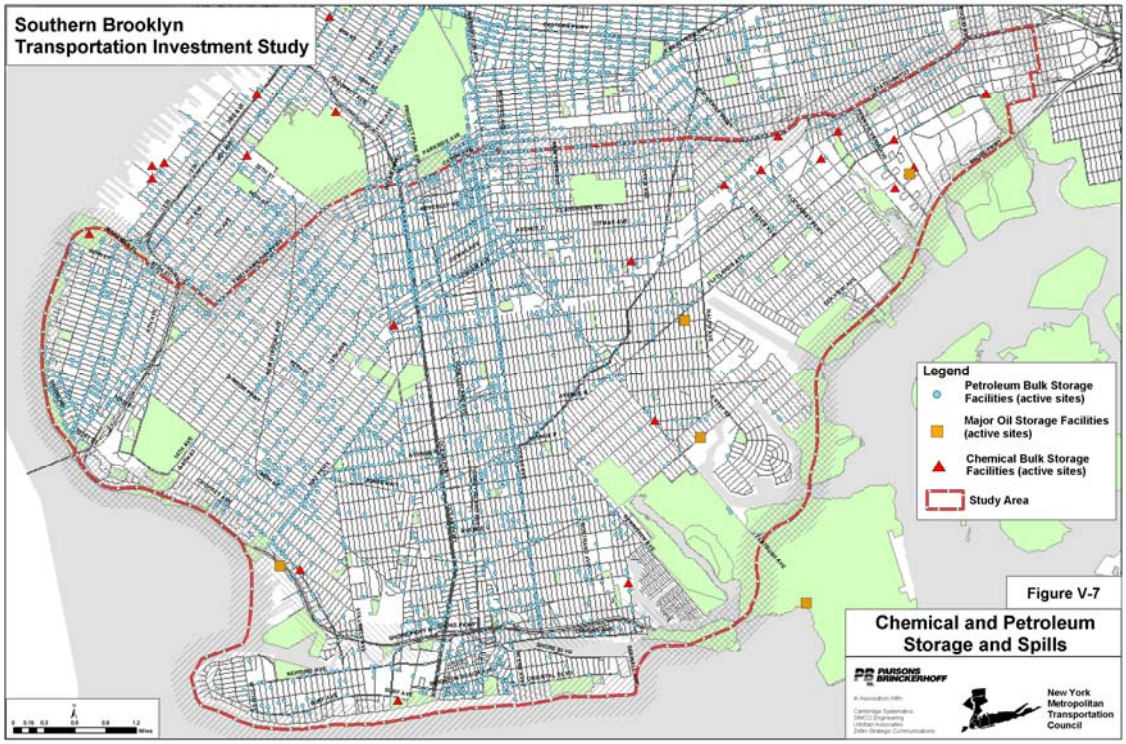
Discussions with staff of the Brooklyn Borough President's Office indicate that a common complaint regarding noise impacts in the area of Southern Brooklyn is airplane noise, particularly above Ocean Parkway, which is below a flight path. While obtaining noise contour data from the Port Authority of New York and New Jersey could reveal if air traffic is the most dominant source of noise at this location, noise barriers would not be effective in addressing such air traffic-generated noise.

In October 2002, New York City's Operation Silent Night initiative was announced, targeting 24 separate areas in the City where noise levels have led to quality of life concerns, and which will be subject to increased enforcement of noise violations. Two of the areas, East Flatbush and Midwood, are within the TIS primary study area.

F. HAZARDOUS WASTE

Major hazardous waste sites in the study area include former landfill sites now being remediated, located between Fresh Creek and Old Mill Creek adjacent to the Belt Parkway, and the Brooklyn Borough Gas works site. Figure V-7 shows active chemical, oil and petroleum storage facilities within the study area, based on the New York State Department of Environmental Conservation's Freedom of Information Law (FOIL) CD-ROM database (April 1, 2002). Sixteen Chemical Bulk Storage Facilities are present within the study area, with eight of these concentrated in the eastern portion of the study area in the vicinity of Brooklyn Terminal Market and Linden Boulevard. Five Major Oil Storage Facilities are present in the study area, primarily in the vicinity of the waterfront, and Petroleum Bulk Storage Facilities can be found throughout the study area, particularly in higher density residential areas where they serve apartment complexes, such as those found along Ocean Parkway and Ocean Avenue. Numerous petroleum spills are also listed in the DEC database. Further site-specific investigations of spills and hazardous substances found in

FIGURE V-7
CHEMICAL AND PETROLEUM STORAGE AND SPILLS



soils and shallow groundwater would be required for transportation projects in the study area that may have potential for impact to hazardous waste sites. Hazardous material spill sites that have been identified as part of previous environmental reviews include subsurface and surface contamination existing at two proposed DOS MTS sites within and adjacent to the study area (Southwest Brooklyn Modified MTS and 65th Street EBUF).[13]

Three Toxic Waste sites within the TIS primary study area are listed on the New York State Department of Environmental Conservation Registry of Inactive Hazardous Waste Disposal Sites in New York State (April 2001). These include the following:

- Brooklyn Borough Gas Works, Coney Island: The Brooklyn Borough Gas Works site (a Class 2 Significant Threat Toxic Waste Site) is located on the site of a former Manufactured Gas Plant located in a residential and commercial area adjacent to the Belt Parkway. This site poses a significant threat based on groundwater concentrations of hazardous waste (benzene) and visible sheen emanating from the site into Coney Island Creek. The site is being investigated and remediated through soil removal and encapsulation.
- Pennsylvania Avenue Landfill: The Pennsylvania Avenue Landfill site (a Class 2 Significant Threat Toxic Waste Site) is owned by the City of New York and the National Park Service. It is located south of the Belt Parkway between Fresh Creek and Hendrix Creek. The shoreline along Fresh Creek has become saturated with oil that is contaminated with PCBs and heavy metals. This contamination is leaching into Jamaica Bay. Closed in 1985, the former landfill is being planned as a passive recreation area of Gateway National Park with its opening expected within the next ten years.
- The Fountain Avenue Landfill (a Class 2 Significant Threat Toxic Waste Site) is located on property that is owned by the National Park Service, south of the Belt Parkway between Hendrix Creek and Old Mill Creek, and is also planned as a passive recreation area. Contaminated groundwater in the area of this former Landfill will eventually discharge into Jamaica Bay.[14]

Additional sites affected by hazardous materials include a commercial area near the Flatbush Depot, which is affected by an underground oil spill. Mitigation plans are underway.

The above-mentioned sites do not comprise a comprehensive listing of all hazardous waste sites in the study area. Once specific investments have been identified through the project, more detailed investigations of hazardous waste site will be conducted through a review of secondary sources. For instance, the U.S. Environmental Protection Agency's Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database contains general information on Superfund sites and potential hazardous waste sites including location, status, contaminants, and actions

13 Ibid.

14 New York Public Interest Research Group, Community Mapping Assistance Project

taken. Sites being assessed under the Superfund Program listed in the CERCLIS database and located in the study area include the following:

TABLE V-5
CERCLIS SITES IN STUDY AREA

Site Name	Address
5700 Avenue U site	5700 Avenue U
Brooklyn Union Gas/Bay Ridge Gate Station	820-884 65th Street
Brooklyn Union Gas/Canarsie Gate Station	E. 83rd Street & Ditmas Avenue
Brooklyn Union Gas/Coney Island Gate Sta	873 Neptune Avenue
Brooklyn Union Gas/Coney Island Works	Neptune Avenue & Shell Road
Brooklyn Union Gas/Flatbush Works	E. Clarkson & Nostrand Avenue
Brooklyn Union Gas/Spring Creek Gate Station	745-757 Montauk Avenue
Crooke Works	Mill Basin
Fort Hamilton	Ft. Hamilton Parkway
Gateway National Recreation Area	
Pennsylvania/Fountain Avenue LF	Pennsylvania Avenue Shore Parkway
Silver Rod Drug Company	114 Beverly Road
William Harvey Corporation	Unknown Address

Source: U.S. Environmental Protection Agency, 2002

G. NATURAL RESOURCES

Because the study area is mostly developed, its environmentally sensitive areas are comprised mainly of tidal wetlands along the southern Brooklyn waterfront, including waterfront areas and significant habitat within the Coastal Zone such as Reach 17 of New York City Department of City Planning's 1994 Plan for the Brooklyn Waterfront. Reach 17 covers the Jamaica Bay and Rockaway portions of the Brooklyn waterfront. These areas contain sensitive intact ecosystems and parkland, including the Gateway National Recreation Area, run by the National Parks Service. As described above, the Plan for the Brooklyn Waterfront recommends protection of this area's natural resources, and mitigating pollution from non-point sources such as roads that surround Jamaica Bay. Specific recommendations include:

- designating Jamaica Bay as a Special Natural Waterfront Area;
- limiting dredging to maintenance of existing channels;
- protecting wetland areas from illegal dumping;
- creating a Paerdegat Basin Natural Area Preserve to protect habitat and provide continuous public access;
- mapping as parkland and undertaking the de-mapping of unbuilt streets in the area of Spring Creek containing Old Mill Creek; and,
- identifying areas of Jamaica Bay for additional boat launch sites, including at Paerdegat Basin.

Since the time that the Plan for the Brooklyn Waterfront was published, the City has released The New Waterfront Revitalization Program: A Proposed 197-a Plan (1999). This program describes waterfront revitalization program policies and designates the Jamaica Bay waterfront area as a Special Natural Waterfront Area, with its tidal wetlands, freshwater wetland habitats and significant Coastal Fish and Wildlife Habitats.

Another City initiative aimed at protecting natural resources within the study area has been the designation in 2001 of four undeveloped park sites in Southern Brooklyn by the New York City Department of Parks and Recreation as Forever Wild, meaning the lands will be preserved in their natural states. All of these Forever Wild park sites abut the Shore Parkway. They include the 530-acre Marine Park, the 67-acre Four Sparrow Marsh Preserve, located to the east of Flatbush Avenue, the 79-acre Fresh Creek Park, located to the west of Starrett City, and the 75-acre Spring Creek Park, which extends into both Queens and Brooklyn. These park sites contain a variety of bird, invertebrate, fish and herpetile wildlife as well as grassland/shrubland, freshwater wetlands and salt marshes.

The New York City Department of Parks and Restoration has five restoration project sites partly funded using New York State Clean Water/Clean Air Bond Act monies, including Hendrix Creek (10 acre freshwater wetland and salt marsh restoration project), Paerdegat Basin (92-acre Combined Sewer Overflow Abatement project), White Island (77 grassland mitigation project), Gerritsen Beach (16 acre maritime restoration) and a 4-acre salt marsh restoration project at Drier-Offerman Park. The Four Sparrows Marsh Habitat Restoration project includes restoration of 3.4 acres of upland natural areas buffering Mill Basin and inland development. Among the objectives of these restoration projects are reduction of non-point source pollution, greater biodiversity, reducing erosion, controlling invasion by nonnative plant species, making natural areas more resistant to urban encroachment and improving the uptake of nutrients and filtration of pollutants. The Four Sparrows Marsh Habitat Restoration project is also intended to discourage use of this natural area by mountain bikers.[15]

The majority of sensitive natural areas and resources within the study area are located adjacent to, or near, Jamaica Bay. According to the GEIS for the Belt Parkway Bridges Rehabilitation, Jamaica Bay comprises "one of the largest coastal wetland systems in New York State." Its marine waters, inlets, bays and estuaries provide "important habitats for aquatic life, and offer habitats for birds, reptiles, and mammals."[16] Four of the bridges studies in the GEIS are within or near Jamaica Bay New York State-designated Significant Coastal Fish and Wildlife Habitats. The bridges are located near significant upland habitat areas that resemble the terrestrial open upland subsystem communities of Hempstead Plains grasslands, maritime dunes, and maritime shrubland. Estuarine resources within the areas of the Belt Parkway bridges studied in the GEIS include areas of deepwater tidal habitat and adjacent tidal wetlands (salt shrub, high salt marsh and low salt marsh). The ecological communities in the surrounding areas of

15 New York City Department of Parks and Recreation.

16 *Final Generic Environmental Impact Statement (FGEIS) for the Proposed Belt Parkway Bridges Rehabilitation Project,* HNTB/EBASCO, 1998, page 9-5.

Jamaica Bay are described in the GEIS as having "high resource values that are irreplaceable." In terms of Wildlife resources, the GEIS found that seven of the ten bridge sites that it studied offer significant habitat for reptiles, amphibians, and mammals.[17]

Discussions over future transportation investment opportunities in Southern Brooklyn will need to consider the natural resources present in the area, including those resources described above. For instance, should physical improvements be identified that have the potential to affect natural resources, investigations of terrestrial and aquatic ecological features will be required. Should there be potential for impacts to wetland resources, a review of secondary sources, such as National Wetlands Inventory (NWI) maps, will be a first step in this assessment to determine the location, extent and character of the wetlands potentially affected, followed if necessary by site visits, wetland delineations and the review procedures of the U.S. Army Corps of Engineers and New York State Department of Environmental Conservation.

H. OTHER ENVIRONMENTAL ISSUES

According to staff of the Brooklyn Borough President's Office, sanitation related complaints are frequently received for the southern portions of the study area, including litter problems and rodent problems in areas such as 86th Street, Coney Island and Bensonhurst.

Water quality is generally good in the environs of Southern Brooklyn. According to the New York City Department of City Planning, in general, water quality in waters around New York has improved over the last 25 years in the conventional parameters: coliform, dissolved oxygen and biochemical oxygen demand. However, as in Southern Brooklyn, combined sewer overflows remain a problem. Combined sewer overflows that discharge to Jamaica Bay affect water quality. Combined Sewer Overflow (CSO) Storage Facility retention basins are being installed by DEP to mitigate this problem at Paerdegat Basin near Flatlands Avenue. Levels of PCB's and metals in New York Harbor sediments are a problem and create critical policy issues for dredging, which is also a concern to residents of Southern Brooklyn. Waters off of Southern Brooklyn generally meet swimming standards, except for the inlets of Gateway National Park and Jamaica Bay. Plum Beach has in the past been subjected to swimming restrictions.

Major environmental facilities in the study area include the 26th Ward Water Pollution Control Plant, located at approximately Seaview Avenue, north of the Shore Parkway; the Owl's Head Water Pollution Control Plant; and the Coney Island Water Pollution Control Plant. Three Marine Transfer Stations (MTS) are planned in Brooklyn. The proposed Southwest MTS is located on the waterfront in Bensonhurst and the Hamilton Avenue MTS is located to the north of the Southern Brooklyn study area. These projects entail a shift to containerization at existing marine transfer facilities, rather than the introduction of new transfer facilities with new truck trips.

17 Ibid.

Chapter VI: Traffic Data Inventory

A. INTRODUCTION

The basic purpose of the traffic data inventory is to identify, gather, review, and collect an adequate traffic database for the subregional travel demand model developed in the SBTIS based on the NYMTC Best Practice Model. The inventory information is intended to establish a baseline condition for evaluating existing conditions, and to identify the types and extent of supplemental traffic data required to simulate travel conditions over the Southern Brooklyn roadway network.

The year 2002 was established as the base year condition for the development of existing traffic operations and transportation system characteristics within the Southern Brooklyn study area. However, as a result of the 9/11 tragedy and subsequent single-occupant-vehicle and commercial vehicle restrictions in accessing Lower Manhattan, abnormal traffic flow conditions prevail in the vicinity of the restricted area and somewhat indirectly affect the surrounding boroughs. In view of the uncertain timeframe for the return to normal traffic conditions in the Lower Manhattan area, special consideration needs to be given to the development of future traffic volumes. To accomplish this, the following protocol was developed for the SBTIS:

- Compile available pre-9/11 traffic data, to the greatest extent possible, for the study area roadway system from available secondary traffic count data sources as follows:
  - 2000 and 2001 traffic counts from the ongoing Coney Island/Gravesend Sustainable Development Transportation Study
  - 1999 and 2000 turning movement, vehicle classification and automatic traffic recorder (ATR) traffic counts from the Gowanus Expressway (I-278) project
  - November 1999 turning movement and ATR traffic counts from the Gowanus Expressway mainline and 3rd Avenue traffic diversion analyses
  - 1997 and 2001 turning movement and ATR counts from the Gowanus Expressway HOV Lane Continuation Study
  - May 2000 ATR traffic counts from the Brooklyn Junction Development Study
  - Balanced 2000 traffic flow volumes from the Delivery of Municipal Waste from Brooklyn and Other Facilities project
  - August 1999 turning movement and ATR traffic counts from the Home Depot traffic study on Cropsey Avenue
  - August and September 1998 turning movement and ATR traffic counts from the Baseball Stadium project at Steeplechase Park
  - ATR counts from NYCDOT files
  - ATR and classification counts from NYSDOT files, including Region 11 pre-9/11 and post-9/11 screenline comparison volume counts
  - Environmental Impact Statements from NYC Department of City Planning files
  - Project files of study team members

- Obtain toll plaza counts at the Verrazano Narrows Bridge and Brooklyn-Battery Tunnel for sample one-week periods before and after the 9/11 period from the files of Triborough Bridge and Tunnel Authority. The before-after traffic comparisons will be used to develop base year (2002) traffic data.
- Perform supplemental turning movement counts during typical weekday and Saturday AM, midday and PM peak periods in Fall 2002 to fill gaps in the available database.
- Conduct continuous ATR traffic counts at selected arterial mainline segments to fill gaps in the available database, as well as to verify the reasonableness of available ATR counts at the critical locations.
- Prepare the base year (2002) traffic counts based on available 1997-2001 traffic counts and their projections to 2002 based on composite growth rates from the following sources:
  - Trip end forecast data obtained from NYMTC files
  - Historical bridge crossing volumes obtained from NYCDOT and MTA Bridges and Tunnels
  - Latest growth rates obtained from NYC Department of City Planning
- Compare the projected 2002 turning movement and ATR counts with actual 2002 intersection and ATR counts to determine the extent of any significant differences between these traffic baseline conditions. If significant differences are observed, the projected 2002 intersections counts would be adjusted based on the comparison of before-and-after 9/11 intersection and ATR counts available in the study area. It is expected that the potential traffic disruption effects of 9/11 event would be dissipated progressively in proportion to the increase in distance from Lower Manhattan.

B. DATA COLLECTION PROCESS

Available information and data regarding the traffic operation and transportation system characteristics were compiled from the following agencies:

- New York State Department of Transportation (NYSDOT)
- New York Metropolitan Transportation Council (NYMTC)
- Metropolitan Transportation Authority (MTA)
- Port Authority of New York & New Jersey (PANYNJ)
- Triborough Bridge and Tunnel Authority (TBTA)
- New York City Department of Transportation (NYCDOT)
- New York City Economic Development Corporation (EDC)
- New York City Department of City Planning (DCP)
- New York City Transit (NYCT)

In particular, a review of existing traffic for ongoing and recently completed projects was reviewed (see Table VI-1).

The databases included: automatic traffic recorder (ATR) counts, intersection turning movement counts, travel speed/delay runs, vehicle classifications, and physical inventory. The locations of available traffic counts as well as the supplemental traffic survey

locations are shown on Figure VI-1. Data from the supplemental traffic survey program and physical inventory survey are summarized in Appendix G.

TABLE VI-1
DATA SOURCES

Study/ Project	Agency
Truck Terminals & Warehouses Survey Results (Feb 2001)	NYMTC
1998-1999 Truck Toll Volumes	NYMTC
Red Hook Truck Study (Nov 1991)	NYCDOT
Commuter Van Service Policy Study (Oct 1998)	NYCDCP
Brooklyn Junction Development Study ATR Data/ Reduction	NYCDOT
The Baseball Stadium at Steeplechase Park (Jan 2000)	NYCDOT
Downtown Brooklyn Traffic Calming Project (Nov 2001, Feb 2000, Nov 1999)	NYCDOT
New York City Bicycle Master Plan (May 1997)	NYCDOT
The Home Depot - Cropsey Avenue (Aug 1999)	NYCDOT
Coney Island / Gravesend Sustainable Development Transportation Study	NYCDOT
Delivery of Municipal Waste from Brooklyn Districts 6, 11, 13 and Other City Department Waste to Facilities in Brooklyn & New Jersey (July 28, 2000)	NYCDOS
Gowanus Expressway Project:	NYSDOT Region 11
Current Traffic Data Summary (1999 & 2000)	
Travel Survey Report (January 2001)	
HOV Lane Continuation Study: Volume 1 - Traffic Data (January 1998)	
HOV Lane Continuation Study: Volume 2 - Incident Data (January 1998)	
HOV Lane Continuation Study: Volume 3 - Traffic Data (Jan 1998 - Revised Feb 1998)	
HOV Lane Continuation Study: Volume 4 - February 1998 Traffic Data (March 1998)	
HOV Lane Continuation Study: Draft Summary Report (April 1998)	
HOV Lane Continuation Study: Phase II Volume 2 - Traffic Data (May 1999)	
HOV Lane Continuation Study: Phase II Volume 5 - March 2001 (May 2001)	
2000 & 2001 Southern Brooklyn ATR Counts	NYSDOT Region 11
1 Hour ATR counts	NYSDOT Region 11
Classification Counts (2000,1999,1998)	NYSDOT Region 11

1. Available Traffic Data

Traffic counts and available data from reports and plans were obtained and reviewed for validity and applicability to the project. Most of the available traffic volume data was collected between 1999 and 2001. A summary of available data resources, including Automated Traffic Recorder (ATR) data and intersection turning movement counts, are presented in Table VI-2, Table VI-3 and Table VI-4. Locations of the existing traffic volume counts that are considered to be valid for this study are presented in Figure VI-1. A summary of 24-hour traffic volumes and AM and PM peak hour volumes on selected major study area roadways is presented in Table VI-5. As expected, the Shore Parkway carried the highest 24-hour traffic flow volume of over 86,000 vehicles in the peak direction on a typical weekday. The weekday peak hour traffic volume was recorded as 5,200 vehicles in the westbound direction during the PM peak hour on this six-lane, divided facility.

TABLE VI-2
AVAILABLE ATR COUNT DATA FROM NYSDOT (LOCAL STREETS)

Location ID	Roadway/Expressway	From	To	Period (2001)	Period (2000)	Period (1999)
1	Prospect Expwy	10th Ave 11th Ave Exit	Fort Hamilton Pkwy		8/1/00-8/4/00	
2	Prospect Expwy	Fort Hamilton Pkwy	Caton Ave	7/23/01-7/27/01		3/16/99-3/19/99
3	Linden Blvd	Flatbush Ave	Kings Hwy		7/16/00-7/21/00	
4	Linden Blvd	Kings Hwy	Rockaway Pkwy	8/6/01-10/6/01		3/16/99-3/19/99
5	Linden Blvd	Rockaway Pkwy	78th St Queens Co Line	8/6/01-10/6/01	8/00, 11/00	4/12/99-4/16/99
6	Verrazano Bridge	Richmond Co Line	Exit 18 Fort Hamilton Pkwy	4/3/01-6/3/01		
7	Gowanus Expy	Exit 18 Fort Hamilton Pkwy	65th St Exit	4/3/01-6/3/01		3/16/99-3/19/99
8	Brooklyn Queens Expwy	65th St Exit	3rd Ave Exit		7/17/00-7/21/00	
9	Brooklyn Queens Expwy	3rd Ave Exit	Rt 27 Prospect Expwy Exit			3/16/99-3/19/99
10	Shore Pkwy	4th Ave Hamilton Pkwy	Int Bay 8th St		7/17/00-7/21/00	
11	Shore Pkwy	Int Bay 8th St	Int Bay Pkwy	7/10/01-7/13/01		5/24/99-5/28/99
12	Shore Pkwy	Int Bay Pkwy	Int Cropsey Ave			5/24/99-5/28/99
13	Shore Pkwy	Int Cropsey Ave	Int Ocean Pkwy South	6/26/01-6/29/01	8/15/00-8/18/00	6/8/99-6/11/99
14	Shore Pkwy	Coney Island Ave Ex	Knapp St	7/10/01-7/13/01		6/22/99-6/25/99
15	Shore Pkwy	Knapp St	Int Flatbush Ave North	7/10/01-7/13/01	8/22/00-8/25/00	7/20/99-7/23/99
16	Shore Pkwy	Int Flatbush Ave North	Int Rockaway		10/2/00-10/6/00	4/99, 6/99
17	Shore Pkwy	Int Rockaway	Int Pennsylvania Ave			6/21/99-6/29/99
18	Shore Pkwy	Int Pennsylvania Ave	Queen Co Line	4/11/01-4/18/01	8/00, 12/00	3/99, 11/99
19	Shore Pkwy	Int Ocean Pkwy South	Coney Island Ave Ex			6/22/99-6/25/99
20	Ocean Pkwy	Shore Pkwy Con	Kings Hwy			5/25/99-5/28/99
21	Ocean Pkwy	Kings Hwy	Church Ave	4/2/01-6/2/01		5/99, 8/99
22	65th St	Avenue P	Bay Pkwy			2/1/99-2/5/99
23	65th St	Bay Pkwy	Fort Hamilton Pkwy		7/16/00-7/21/00	
24	65th St	Fort Hamilton Pkwy	I 278	6/25/01-6/29/01		
25	86th St	Avenue U	Bay Pkwy		7/22/00-7/28/00	5/4/99-5/7/99
26	86th St	Bay Pkwy	I 278	6/25/01-6/29/01		
27	Avenue J	Bay Pkwy	Coney Is Av		7/22/00-7/28/00	3/1/99-3/5/99
28	Avenue J	Coney Is Av	Ocean Ave			5/9/99-5/14/99
29	Avenue J	Ocean Ave	Nostrand Ave	8/6/01-8/10/01		2/1/99-2/5/99
30	Avenue J	Nostrand Ave	Flatbush Ave		7/29/00-8/4/00	
31	Avenue J	Flatbush Ave	Kings Hwy	8/6/01-8/10/01		
32	Avenue J	Kings Hwy	Flatbush Ave			5/9/99-5/14/99
33	Avenue N	Kings Hwy	E 35th St		7/21/00-7/25/00	
34	Avenue P	65th St	Ocean Pkwy	6/24/01-6/29/01		
35	Avenue P	Ocean Pkwy	Coney Is Av			5/4/99-5/7/99
36	Avenue P	Coney Is Av	Ocean Pkwy		8/21/00-8/25/00	5/4/99-5/7/99
37	Avenue P	Ocean Ave	Kings Hwy	7/8/01-7/13/01		3/1/99-3/5/99
38	Avenue U	86th St	Ocean Pkwy			5/4/99-5/7/99
39	Avenue U	Ocean Pkwy	Ocean Ave		7/22/00-7/28/00	
40	Avenue U	Ocean Ave	Nostrand Ave			2/1/99-2/5/99
41	Avenue U	Nostrand Ave	Gerritsen Ave	7/9/01-7/13/01		
42	Avenue U	Gerritsen Ave	Flatbush Ave		7/22/00-7/28/00	5/4/99-5/7/99
43	Avenue U	Flatbush Ave	Mill Ave	7/9/01-7/13/01		
44	Bay Pkwy	L Ericson Dr	Cropsey Ave			5/4/99-5/7/99
45	Bay Pkwy	L Ericson Dr	86th St		7/30/00-8/5/00	
46	Bay Pkwy	86th St	65th St			3/1/99-3/5/99
47	Bay Pkwy	65th St	Avenue J	6/24/01-6/29/01		
48	Bedford Ave	Emmons Ave	Kings Hwy		7/24/00-7/28/00	2/1/99-2/5/99
49	Bedford Ave	Kings Hwy	Avenue J	7/8/01-7/13/01		
50	Caton Ave	Fort Hamilton Pkwy	E 5th St			5/11/99-5/14/99
51	Caton Ave	E 5th Ave	Linden Blvd		7/24/00-7/28/00	3/1/99-3/5/99
52	Coney Island Ave	Neptune Ave	L Ericson Dr	6/25/01-6/29/01		5/3/99-5/7/99
53	Coney Island Ave	L Ericson Dr	Avenue P			3/1/99-3/5/99

TABLE VI-2 (CONTINUED)
AVAILABLE ATR COUNT DATA FROM NYSDOT (LOCAL STREETS)

Location ID	Roadway/Expressway	From	To	Period (2001)	Period (2000)	Period (1999)
54	Coney Island Ave	Avenue P	Avenue J		7/22/00-7/28/00	2/1/99-2/5/99
55	Coney Island Ave	Avenue J	Church Ave	6/25/01-6/29/01		5/9/99-5/14/99
56	Coney Island Ave	Church Ave	Park Circle			5/11/99-5/14/99
57	Cropsey Ave	Neptune Ave	L Ericson Dr			5/1/99-5/7/99
58	Cropsey Ave	L Ericson Dr	Bay Pkwy		7/31/00-8/4/00	5/4/99-5/7/99
59	Cropsey Ave	Bay Pkwy	Bay 8th St	6/26/01-6/29/01		3/1/99-3/5/99
60	Flatbush Ave	Avenue J	Nostrand Ave		7/29/00-8/5/00	5/9/99-5/14/99
61	Fort Hamilton Pkwy	65th St	39th St			5/10/99-5/14/99
62	Kings Hwy	Utica Ave	Linden Blvd	8/6/01-8/10/01		
63	Nostrand Ave	Avenue J	Flatbush Ave	7/9/01-7/13/01		5/9/99-5/14/99
64	Ocean Ave	Avenue J	Caton Ave		8/14/00-8/18/00	5/9/99-5/14/99
65	Parkside Ave	Park Cir	Bedford Ave	7/23/01-7/27/01		5/11/99-5/14/99
66	Pennsylvania Ave	Shore Pkwy	Flatland Ave			5/15/99-5/21/99
67	Pennsylvania Ave	Flatland Ave	Linden blvd			5/15/99-5/21/99
68	Ralph Ave.	Mill Ave	Flatlands Ave	7/9/01-7/13/01		2/22/99-2/26/99
69	Ralph Ave.	Flatlands Ave	Remsen Ave			5/15/99-5/21/99
70	Remsen Ave	Ralph Ave	Linden Blvd	8/13/01-8/17/01		2/22/99-2/26/99
71	Rockaway Pkwy	Rockaway Ave	Linden Blvd			2/22/99-2/26/99
72	Rockaway Pkwy	Shore Pkwy	Flatland Ave			5/15/99-5/21/99
73	Rogers Ave	Flatbush Ave	Linden Blvd	8/14/01-8/17/01		2/22/99-2/26/99
74	Surf Ave	W 37th St	W 17th St			5/1/99-5/7/99
75	Utica Ave	Flatbush Ave	Flatland Ave		9/30/00-10/6/00	2/22/99-2/26/99
76	Utica Ave	Flatland Ave	Kings Hwy			5/9/99-5/14/99
77	Utica Ave	Kings Hwy	Linden Blvd			10/31/99-11/5/99
78	W 37th St	Surf Ave	Neptune Ave			5/1/99-5/7/99

TABLE VI-3
AVAILABLE ATR COUNT DATA FROM NYSDOT (RAMPS & OVERPASS)

Location ID	Road name	From	To	Period (2001)	Period (2000)	Period (1999)
1	4th Ave	-	Over Route 907C Shore Pkwy	6/24/01-6/29/01		
2	Bay 8th St	-	Over Route 907C Shore Pkwy	6/24/01-6/29/01		
3	Cropsey Ave	-	Over Shore Pkwy	6/24/01-6/29/01		
4	Coney Is Ave	-	Over Route 907C Shore Pkwy	6/25/01-6/29/01		
5	Cropsey Ave	-	Over Coney Is Creek	6/26/01-6/29/01		
6	Stillwell Ave	-	Over Coney Is Creek	6/26/01-6/29/01		
7	Bay Ave	Bay 29th St	Bay Pkwy	7/9/01-7/13/01		
8	Ave U	E 23rd St	E 24th St	7/9/01-7/13/01		
9	92nd St	-	Over 278IX		7/17/00-7/21/00	
10	Caton Ave	-	Over Prospect Expwy		8/14/00-8/18/00	
11	Ramp to Ocean Pkwy	-	Over Prospect Expwy		8/14/00-8/18/00	
12	Fort Hamilton Pkwy	-	Over 278IX		7/22/00-7/28/00	
13	7th Ave	-	Over 278IX		7/31/00-8/4/00	
14	65th St	-	Over Gowanus Expwy		7/31/00-8/4/00	
15	Caton Ave	-	Over NYCTA Brighton Line			7/20/99-7/23/99
16	Ditmas Rd	-	Over NYCTA Brighton Line			8/2/99-8/6/99
17	92nd St	-	Over 278IX			5/17/99-5/21/99
18	86th St	-	Over 278IX			5/17/99-5/21/99
19	18th Ave	-	Over Conrail Bay Ridge			8/2/99-8/6/99
20	86th St	-	Over NYCTA Sea Beach			8/3/99-8/6/99
21	Avenue P	-	Over NYCTA Sea Beach			9/13/99-9/17/99
22	Avenue U	-	Over NYCTA Sea Beach			9/13/99-9/17/99
23	3rd Ave	-	Over Shore Rd Dr			11/15/99-11/19/99
24	Coney Is Ave	-	Over Belt Pkwy			7/20/99-7/23/99
25	Ocean Ave	-	Under Rt 907 Belt Pkwy			7/20/99-7/23/99
26	Bedford Ave	-	Under Belt Pkwy			7/20/99-7/23/99
27	Nostrand Ave	-	Under Belt Pkwy			7/20/99-7/23/99
28	Fort Hamilton Pkwy	-	Over Prospect Expwy			6/7/99-6/11/99
29	Cropsey Ave	-	Over Belt Pkwy			6/6/99-6/11/99
30	Cropsey Ave	-	Over Coney Is Creek			4/12/99-4/16/99
31	Stillwell Ave	-	Over Coney Is Creek			4/12/99-4/16/99
32	Bath Ave	29th St	Bay Pkwy			5/10/99-5/14/99

TABLE VI-4
AVAILABLE TURNING MOVEMENT COUNTS FROM OTHER PROJECTS

Location ID	Intersection	Date of Count	Information
1	W 22 St (NB) @ Surf Ave (E-W)	08/1998	
2	W 21 St (N-S) @ Surf Ave (E-W)	08/1998	
3	W 20 St (NB) @ Surf Ave (E-W)	08/1998	
4	W 19 St (N-S) @ Surf Ave (E-W)	08/1998	
5	W 17 St (N-S) @ Surf Ave (E-W)	08/1998	*Source:* *The Baseball Stadium at Steeplechase Park*
6	W 16 St (N-S) @ Surf Ave (E-W)	08/1998	
7	W 15 St (N-S) @ Surf Ave (E-W)	08/1998	
8	W 8 St (N-S) @ Surf Ave (E-W)	08/1998	
9	W 5 St (N-S) @ Surf Ave (E-W)	08/1998	*Traffic Data:*
10	Cropsey Ave/W 17 St (N-S) @ Neptune Ave (E-W)	08/1998	*Weekday MD (12:30-1:30 PM) and PM (4:00-5:00 PM and 5:00-6:00 PM) Peak Hours*
11	Stillwell Ave @ Neptune Ave (E-W)	08/1998	
12	Coney Island Ave (N-S) @ Neptune Ave (E-W)	08/1998	
13	W 20 St (N-S) @ Neptune Ave (E-W)	08/1998	
14	W 19 St (N-S) @ Neptune Ave (E-W)	08/1998	
15	Neptune Ave (E-W) @ Ocean Pkwy (N-S)	08/1998	
16	Belt Pkwy (EB) @ Ocean Pkwy (N-S)	08/1998	
17	Belt Pkwy (WB) @ Ocean Pkwy (N-S)	08/1998	
1	3rd Ave @ 86th St	6/2/99, 6/3/99, 6/8/99	
2	3rd Ave @ Bay Ridge Pkwy	6/2/99, 6/3/99, 6/8/99	
3	4th Ave @ 86th St	6/2/99, 6/3/99, 6/8/99	
4	4th Ave @ Bay Ridge Pkwy	6/2/99, 6/3/99, 6/8/99	
5	4th Ave @ Shore Road Drive	6/2/99, 6/3/99, 6/8/99	
6	5th Ave @ 86th St	6/2/99, 6/3/99, 6/8/99	
7	5th Ave @ 65th St	5/18/99, 5/20/99, 6/9/99	
8	6th Ave @ 65th St	5/18/99, 5/20/99, 6/9/99	
9	7th Ave @ 65th St	6/2/99, 6/3/99, 6/8/99	*Source:*
10	7th Ave @ Bay Ridge Pkwy	6/2/99, 6/3/99, 6/8/99	*Gowanus Expressway Project*
11	Ft.Hamilton Pkwy @ 65th St	6/2/99, 6/3/99, 6/8/99	
12	Ft.Hamilton Pkwy @ McDonald Ave	5/11/99, 5/12/99, 5/13/99	*Traffic Data:*
13	Ft.Hamilton Pkwy @ Caton Ave	5/11/99, 5/12/99, 5/13/99	*Weekday AM and PM Peak Hours*
14	Ocean Pkwy @ Shore Pkwy EB	6/2/99, 6/3/99, 6/8/99	
15	Ocean Pkwy @ Shore Pkwy WB	6/2/99, 6/3/99, 6/8/99	
16	Ocean Pkwy @ Ave U	6/2/99, 6/3/99, 6/8/99	
17	Ocean Pkwy @ Kings Highway	6/2/99, 6/3/99, 6/8/99	
18	Ocean Pkwy @ Church Ave	5/11/99, 5/12/99, 5/13/99	
19	Coney Island Ave @ Ave Z	6/2/99, 6/3/99, 6/8/99	
20	Coney Island Ave @ Ave U	6/2/99, 6/3/99, 6/8/99	
21	Coney Island Ave @ Kings Highway	6/2/99, 6/3/99, 6/8/99	
22	Coney Island Ave @ Church Ave	5/11/99, 5/12/99, 5/13/99	

FIGURE VI-1
TRAFFIC COUNT LOCATIONS

TABLE VI-5
AVAILABLE ATR COUNT DATA

Location		Count Date	Direction	24-Hour Volume	AM Peak Hour	PM Peak Hour
Linden Blvd	E of Rockaway Pkwy	11/26/2002	WB	21,100	1,890	1,180
			EB	22,000	1,030	1,520
Avenue U	E of Coney Island Ave	7/22/2000	EB	5,500	310	390
			WB	5,600	300	350
Bay Pkwy	N of 86th Street	7/22/2000	NB	12,300	650	780
			SB	12,100	690	750
Coney Island Ave	S of Avenue J	7/22/2000	NB	14,000	920	870
			SB	11,600	570	860
Flatbush Ave	S of Nostrand Ave	7/29/2000	SB	12,000	530	810
Rockaway Pkwy	N of Flatlands Ave	8/21/2000	NB	7,300	480	370
			SB	9,800	410	620
Utica Ave	S of Flatland Ave	2/22/1999	NB	9,100	680	650
		9/30/2000	SB	8,700	470	710
Shore Pkwy	E of Cropsey Ave	6/26/2001	WB	86,300	4,760	5,180
			EB	83,500	4,650	4,840
Shore Pkwy	W of Flatbush Ave	7/10/2001	WB	71,500	4,160	4,330
			EB	71,600	4,200	4,600
Kings Hwy	S of Linden Blvd	8/6/2001	SB	12,600	690	990
Parkside Ave	E of Bedford Ave	7/23/2001	EB	8,400	510	590
			WB	10,200	590	640
Ralph Ave	S of Flatland Ave	7/9/2001	NB	14,600	720	1,010
			SB	11,800	600	920
Ocean Pkwy	S of Kings Hwy	5/25/1999	NB	24,500	1,720	1,460
			SB	25,100	1,180	1,750
Ft Hamilton Pkwy	N of 61st St	5/10/1999	NB	9,900	800	600
			SB	10,400	620	730
18th Avenue	N of 65th St	8/2/1999	EB	6,600	410	400
			WB	6,200	350	430
Pennsylvania Ave	N of Shore Pkwy	5/15/1999	NB	17,900	1,450	930
			SB	13,100	580	1,080
Gowanus Expy	Before 92nd St	5/25/1999	NB	60,500	5,280	2,870

C. SUPPLEMENTAL TRAFFIC DATA

Based on a review of available traffic data, supplemental survey data required to fill gaps and to update the current traffic baseline condition have been identified related to the following elements within the study area:

- Fatal accident locations – two or more fatality locations
- Pedestrian/bicycle accident locations
- High accident occurrence locations – over 100 accident occurrences
- Designated truck routes – official truck routes in Brooklyn
- Major activity centers – commercial development locations and other activity centers
- Major development projects – committed developments
- Coverage counts in the BPM network – available count data links
- Valid pre-9/11 count locations

1. Traffic Flow Volumes

Traffic flow volume data has been collected as part of the Traffic Data Inventory. Continuous, 48-hour ATR volume counts at 25 coverage locations (50 unidirectional, mid-block locations) were obtained on two mid-week days (e.g., Tuesday, Wednesday or Thursday). In addition, ATR counts were conducted at five control-station locations (10 unidirectional locations) for a one week period (seven days) concurrent with the 48-hour count period. The purposes of the control-station counts were to establish traffic flow variations, provide average daily traffic (ADT) volume estimates, and allow adjustment of the 48-hour ATR traffic counts taken at the 25 coverage locations to a common weekday database. The ATR traffic counts were performed in summer (August 2002), fall (November 2002), and spring (May 2003). ATR count locations are shown on Figure VI-1 and the count summaries are presented in Appendix G.1. Results of raw ATR axle counts were calibrated to represent the total number of vehicles. Sample 15-minute vehicle classification counts were collected at the ATR locations during the summer (August 2002) and spring (May 2003) survey periods. Axle calibration factors were generally at or close to 1.00; thus, no adjustment factors were applied to the ATR counts.

The control-station ATR counts were conducted over a three-week period from August 16 to September 9, 2002 on Shore Parkway, Flatbush Avenue, Kings Highway and Ocean Parkway. The counts were repeated at these four locations plus at another location on Linden Boulevard from November 16 to November 28, 2002, and from May 11 to May 20, 2003. The control-station ATR count locations are listed below.

- Shore Parkway west of Flatbush Avenue
- Flatbush Avenue south of Avenue H
- Kings Highway south of Avenue N
- Ocean Parkway south of Ditmas Avenue
- Linden Boulevard east of Brooklyn Avenue

The hourly traffic variation pattern at these ATR count locations for a typical weekday exhibit the pattern of a typical commuter-oriented roadway with two distinct peak

periods, generally occurring from 7:00 to 10:00 AM and from 4:00 to 7:00 PM. A review of daily traffic volumes also reveals that weekend (i.e., Saturday and Sunday) traffic volumes are generally similar to weekday volumes on major arterial routes, except on Kings Highway. The Kings Highway weekend traffic volumes were substantially lower than the weekday traffic volumes. Daily traffic volumes are shown in Table VI-6.

TABLE VI-6
AVERAGE DAILY TRAFFIC VOLUMES

TIME	Ocean Parkway (Mainline)		Linden Boulevard		Flatbush Avenue		Kings Highway		Shore Parkway	
	NB	SB	EB	WB	NB	SB	EB	WB	EB	WB
Sunday	28,710	31,930	11,940	10,430	17,010	13,100	6,540	6,310	72,440	72,230
Monday	29,980	31,360	12,340	11,470	17,210	12,730	10,490	10,140	75,350	74,360
Tuesday	30,730	33,250	12,160	11,590	18,550	12,960	10,770	10,350	75,550	73,790
Wednesday	29,950	30,500	12,310	11,630	18,830	13,120	10,740	10,360	75,220	73,320
Thursday	31,680	31,900	12,090	11,540	18,520	13,200	10,820	10,290	79,030	60,400
Friday	30,790	33,490	12,970	12,000	18,490	12,590	10,820	10,140	80,210	78,270
Saturday	27,050	28,360	13,260	11,750	19,690	15,120	7,480	7,020	78,420	78,970

Source: SIMCO Engineering, P.C. ATR traffic data from 05/11/03 to 05/20/03.

2. Turning Movement Counts

Manual turning movement counts were conducted in three categories (i.e., cars, buses and trucks) in 15-minute intervals concurrently with the ATR counts during the morning (6:00-10:00 AM), midday (11:00 AM - 2:00 PM) and the afternoon (3:00-7:00 PM) peak periods on one mid-weekday (e.g., Tuesday, Wednesday or Thursday) at 25 intersections in the study area.

The turning movement count data were summarized and a peak hour for each period was established based upon the cumulative summary of the ATR and manual turning movement counts in the study area. In addition, the peak hour factors and heavy vehicle percentage for each intersection approach for the peak hour of each peak period was determined. Turning movement diagrams and field inventory diagrams were prepared for each intersection and are presented in Appendix G.2.

3. Vehicle Classification Counts

Manual vehicle classification counts were performed concurrently with the ATR traffic counts at 20 locations during the three peak periods (6:00 - 10:00 AM, 11:00 AM - 2:00 PM and 3:00 - 7:00 PM) on one mid-weekday peak period. The vehicle classification counts were collected for each travel direction in 13 FHWA categories including the SUV category. The classification counts are summarized in Appendix G.3.

4. Travel Time and Delay Runs

Travel time and delay runs were conducted on the following five major travel routes in the study area:

- Fort Hamilton Parkway from Shore Parkway – Parkside Avenue – Linden Boulevard at Fountain Avenue
- Flatbush Avenue from Shore Parkway to Parkside Avenue
- Shore Parkway from Conduit Avenue to 3rd Avenue/65th Street Exit Ramp
- Kings Highway from Bay Parkway to Linden Boulevard
- Ocean Parkway from Surf Avenue to Parkside Avenue

The travel time and delay runs were conducted using the "floating car" method to obtain a minimum of three runs in each travel direction during the morning (6:00 - 10:00 AM), midday (11:00 AM - 2:00 PM), and afternoon (3:00 - 7:00 PM) peak periods for one typical mid-weekday. The test car was operated by a two-person survey team (a driver and a data recorder) at prevailing speeds in the general traffic stream along the particular travel route. Elapsed time, mileage and delays (e.g., accident, signal, vehicle breakdown, etc.) were recorded at designated checkpoints (e.g., interchanges and major cross streets). The travel time data was used to estimate average travel speed on the selected travel routes for each peak period (see Appendix G.4).

5. Intersection Inventory Survey

A physical inventory survey was conducted at the turning movement count intersections to gather information about the existing roadway geometries and traffic control regulations (see Appendix G.5). The following information was compiled:

- Roadway, sidewalk and crosswalk widths
- Lane width and number of travel lanes
- Curb parking regulations
- Lane utilization
- Signal timing
- Traffic control devices (type and location)
- Bus stop locations, bus routes, and frequency of buses
- Posted speed limits
- Loading areas
- Regulatory signs, markings and islands
- Direction of travel

The intersection signal timing data was field checked separately during each peak period to ascertain actual signal operating conditions. The field timing data was also compared to NYCDOT signal timing records.

6. Roadway and Bridge Inventory

An inventory of generalized characteristics of major roadways within the study area were compiled from available data sources. The initial inventory effort involved the identification of the following potential data sources:

- NYSDOT Highway Sufficiency Rating Report
- NYCDOT Truck Route Network Borough Maps
- NYCDOT Division of Bridges Inventory of Structures

The roadway database inventory was primarily directed toward the following major travel routes in the study area:

- Belt Parkway (Shore Parkway) between 65th Street and Cross Bay Boulevard
- Fort Hamilton Parkway between 101st Avenue and Dahill Road
- Caton Avenue between Dahill Road and Bedford Avenue
- Linden Boulevard between Bedford Avenue and Fountain Avenue
- Kings Highway between Bay Parkway and Linden Boulevard
- Ocean Parkway between Caton Avenue and Sea Breeze Avenue
- Flatbush Avenue between Caton Avenue and Belt Parkway
- Atlantic Avenue between Flatbush Avenue and Conduit Boulevard

Although Atlantic Avenue is located outside the northern study area boundary, this roadway is considered to be an essential east-west through and truck route for transportation service in the Southern Brooklyn communities.

The Highway Sufficiency Ratings report provides comprehensive roadway characteristics and condition data of the NYS Touring and Reference Route Systems as well as parkways for state numbered highways and those non-state roads signed as state routes for the sake of continuity in driving. As such, the Highway Sufficiency data is available for only three roadways within the study area: Ocean Parkway (State Route 908H), Linden Boulevard (State Route 27) and the Shore Parkway (State Route 907C). The Sufficiency data on these roadways included extensive physical, system, traffic, pavement condition, and other roadway characteristics (e.g., shoulder type, median width, median type and terrain). The extract sections of Highway Sufficiency Ratings for these three roadways are provided in Appendix G.6.1.

To supplement the available roadway inventory database, field reconnaissance trips were conducted along the aforementioned routes within the study area limits. The visual field inventory information included traffic signal control, adjacent land use, number of travel lanes, curb parking, median, shoulder, sidewalk, and one-way or two-way street (see Appendix G.6.2). In addition, ground-level photographs were taken along the frontages of the above travel routes to document the actual land use and lane usage conditions. Copies of photographs are provided in Appendix G.6.3.

Bridges also were inventoried. Available information in the NYCDOT Division of Bridges Inventory of Structures was reviewed in the "2001 Bridges and Tunnels Annual Condition Report." The information includes bridge inventory number (BIN), bridge

location, bridge type, bridge rating and community board district. A total of 97 bridges were identified in the study area, as shown in Appendix G.6.4.

The information on the extent of designated truck routes within the study area was obtained from the NYCDOT files (see Chapter III, Figure III-1). Three roadways in the study area (Gowanus Expressway, Flatbush Avenue and Atlantic Avenue) are identified as through truck routes, which are restricted to trucks having neither origins nor destinations within the Borough of Brooklyn. Most of the other major roadways are presently identified as local truck routes for use by trucks with local origins or destinations. For instance, designated local truck routes include Linden Boulevard, Kings Highway, Coney Island Avenue, McDonald Avenue, Avenue U, 65th Street and 86th Street.

7. Origin-Destination Surveys

Analysis of origin-destination (O-D) travel pattern information within the SBTIS study area provides an understanding of motorists' and transit users' travel behavior characteristics. This data will be critical to potential transportation investment decisions for the project. A search was made of the available O-D survey databases from secondary data sources as follows:

- New York State Department of Transportation (NYSDOT)
- New York City Department of Transportation (NYCDOT)
- Metropolitan Transportation Authority (MTA)
- Port Authority of New York & New Jersey (PANYNJ)

Based on an overview of the available data, brief descriptions of pertinent O-D information are provided below:

- **Gowanus Expressway I-278 Travel Survey Report (Revised January 2001).** A comprehensive travel survey was sponsored by NYSDOT in connection with the DEIS preparation for the 5.7-mile Gowanus Expressway Project corridor in May and June of 1999. The Gowanus travel survey area encompassed essentially one-third of the eastern portion of the Southern Brooklyn study area. The survey methodology involved video license plate surveys at 33 locations along the Gowanus Expressway and Shore Parkway facilities and hand-out/audio license plate surveys at 52 locations along local streets over a 13-hour daylight period in May and June 1999. Mail-back questionnaires were sent to a random sample of registered drivers' addresses obtained from DMV files. The passenger vehicle survey questionnaires provided the following trip and socio-economic characteristics:

  — Trip origin and destination
  — Trip purpose
  — Trip beginning and ending time
  — Latest time allowed to arrive at work or school
  — Trip frequency
  — Trip length
  — Vehicle type

- Vehicle occupancy
- Parking cost and tolls
- HOV lane usage
- Highways used
- Public transportation options
- Household size
- Employed resident
- Auto ownership
- Number of licensed drivers
- Household income

Separate questionnaires for commercial vehicles provided information on the following truck movement activity:

- Trip origin and destination
- Facility type at trip origin and destination
- Trip purpose
- Trip beginning and ending time
- Trip frequency
- Trip length
- Vehicle type (by axles and tires)
- Vehicle occupancy
- Fuel type
- Type of restricted goods or materials carried
- Highways used
- Alternate travel options
- Alternate travel routes

The significant findings and results of the Gowanus Expressway O-D survey are provided below.

- Over 80 percent of the Gowanus Expressway users originated from Brooklyn and Staten Island in the AM peak period.
- Majority of the Gowanus Expressway users (50 percent) are destined for Manhattan, 30 percent for downtown Brooklyn, and over 10 percent for the Long Island City area in Queens.
- Over 40 percent of the Gowanus Expressway users incurred a one-way travel time between 41 to 60 minutes.
- More than three quarters (75 percent) of the users made the trip by passenger cars.
- Work-related trips accounted for over 85 percent of the Gowanus Expressway inbound trips during the AM peak period.
- The Verrazano-Narrows Bridge entrance ramp was used by more than 33 percent of the Gowanus Expressway users, and approximately 20 percent of the users used each of the Shore Parkway, the Prospect Expressway and the ramps between 92nd and 65th Streets.

- More than half of the users exited onto the BQE and nearly one third used the Brooklyn Battery Tunnel exit ramp.
- Over 60 percent of the Gowanus Expressway users are single occupant vehicles, and 28 percent traveled in 2-person vehicles.
- Nearly 75 percent of the users exiting the Fort Hamilton Parkway exit ramp are destined for the southern Brooklyn (Bay Ridge) area.
- Almost 60 percent of the users exiting at 7th Avenue/65th Street exit ramp are destined for the Sunset Park neighborhood, while more than 22 percent of the users are bound for the Bay Ridge area.

- **MTA Bridges and Tunnels Origin-Destination Survey (April 1999).** A comprehensive O-D survey of passenger and commercial vehicles was sponsored by the MTA at all nine bridge and tunnel facilities on a mid-week day and a weekend day (Saturday or Sunday) in June 1997. The O-D questionnaire survey was conducted over a full 24-hour period at the following MTA facilities:

  - Verrazano-Narrows Bridge
  - Triborough Bridge (Manhattan and Bronx Plaza)
  - Throggs Neck Bridge
  - Bronx-Whitestone Bridge
  - Henry Hudson Bridge
  - Marine Parkway-Gil Hodges Memorial Bridge
  - Cross Bay Veterans Memorial Bridge
  - Brooklyn Battery Tunnel
  - Queens Midtown Tunnel

  Results of this MTA O-D survey provided the following information:

  - Trip origin
  - Trip destination
  - Trip purpose
  - Trip frequency
  - Vehicle occupancy
  - Residence location
  - Cargo type

  The significant findings and results of the MTA Bridges and Tunnels O-D survey are provided below.

  - Nearly 70 percent of auto trips using the manual toll lanes at all TBTA facilities originated in New York City (i.e., Manhattan, Queens, Bronx, Brooklyn and Staten Island).
  - Trips using manual toll lanes originating in New York City represented 58 percent of al Saturday trips and 60 percent of all Sunday trips.

- New York City accounted for 66 percent of all weekday auto trip destinations, 57 percent of all Saturday auto trips, and 59 percent of all Sunday trip destinations at manual toll lanes.
- Over a 24-hour period, 27 percent of weekday auto trips were Home-to-Work, 20 percent were Work-to-Home, and 19 percent were other Work-related trips at manual toll lanes.
- The majority of autos on a weekday using the manual toll lanes were single occupant vehicles (58 percent), followed by 2-occupant vehicles (29 percent), and three-occupant vehicles (9 percent).

D. TRANSPORTATION IMPROVEMENT PLAN (TIP) PROJECTS

The Transportation Improvement Program (TIP), described earlier in Chapter II, is a multimodal program. The following table lists bridge and roadway projects programmed on the current FY2002-2004 TIP that are either within the SBTIS study area, or directly affect access to it.

Some of the items listed in Table VI-7 are system-wide projects that address as-needed repairs throughout the boroughs. Such system-wide projects are programmed annually anticipating a normal amount of repairs and rehabilitation, such as maintenance of arterials and communication system upgrades.

TABLE VI-7
TRANSPORTATION IMPROVEMENT PROGRAM (TIP) BRIDGES AND ROADWAYS – PROJECTS WITHIN OR AFFECTING SBTIS STUDY AREA (FY 2002-2004 TIP)

PIN #	DESCRIPTION
X021.52	REHABILITATION OF THE BELT PARKWAY OVER MILL BASIN BRIDGE.
X021.53	REHABILITATION OF THE BELT PARKWAY OVER FRESH CREEK.
X021.54	REHABILITATION OF THE BELT PARKWAY BRIDGE OVER GERRITSON INLET.
X021.62	REHABILITATION OF THE BELT PARKWAY BRIDGE OVER PAERDEGAT BASIN.
X021.68	REHABILITATION OF BELT PARKWAY BRIDGE OVER NOSTRAND AVE.
X735.45	I-678 VAN WYCK EXPRESSWAY QUEENS BLVD JAMAICA REHABILITATE FOUR BRIDGES ALONG THE VAN WYCK EXPRESSWAY INCLUDING CONSTRUCTION OF HILLSIDE AND JAMAICA AVES AUXILIARY LANES
X735.56	I-678 VAN WYCK EXPRESSWAY - REHABILITATE NINE BRIDGES AT THE KEW GARDENS INTERCHANGE.
X735.57	I-678 VAN WYCK EXPRESSWAY - REHABILITATE THE 14TH AVENUE BRIDGE AND FIVE BRIDGES SOUTH OF NORTH CONDUIT AVENUE. ADDRESS SAFETY IMPROVEMENTS.
X757.64	BELT PARKWAY / OCEAN PARKWAY INTERCHANGE REHABILITATION
X803.18	BELT PARKWAY / ROCKAWAY PARKWAY
X804.19	BROOKLYN ITS PHASE 1 CONSTRUCTION OF THE INTELLIGENT TRANSPORTATION SYSTEM (ITS) FOR STATE ROUTE IN BROOKLYN
X021.41	IMPROVEMENTS TO THE DRAINAGE SYSTEM ON VARIOUS LOCATIONS ON THE BELT PARKWAY SYSTEM (OWLS HEAD VIADUCT - WHITESTONE BRIDGE)
X072.09	NASSAU EXPRESSWAY PAVEMENT REHABILITATION AND RESURFACING FROM CROSSBAY BLVD TO BROOKVILLE BLVD
X729.93	I-278 GOWANUS EXPRESSWAY (VERRAZANO BRIDGE - BQE/BATTERY TUNNEL) MONITORING AND INSPECTION OF THE I-278 GOWANUS EXPRESSWAY WITH THE FINAL DESIGN OF EMERGENCY REPAIRS TO THE VIADUCT UNTIL THE RECONSTRUCTION PLUS THE GOWANUS ENVIRONMENTAL IMPACT STATEMENT.
X729.94	I-278 GOWANUS EXPRESSWAY (VERRAZANO BRIDGE - BQE/BATTERY TUNNEL) MONITORING AND INSPECTION OF THE I-278 GOWANUS EXPRESSWAY WITH THE FINAL DESIGN OF EMERGENCY REPAIRS TO THE VIADUCT UNTIL THE RECONSTRUCTION PLUS THE GOWANUS ENVIRONMENTAL IMPACT STATEMENT.
X730.85	I-278 GOWANUS EXPRESSWAY (VERRAZANO BRIDGE TO BATTERY TUNNEL) INTERIM EMERGENCY REPAIRS FY 1999 - IMPROVE RIDEABILITY AND ADDRESS SAFETY/STRUCTURAL FLAGS ALONG THE ENTIRE VIADUCT. OPERATION OF THE UPPER GOW BUS/HOV LANE AND BUILD AND OPERATE LOWER GOWANUS
X730.88	I-278 GOWANUS EXPRESSWAY (VERRAZANO BRIDGE TO BATTERY TUNNEL) INTERIM EMERGENCY REPAIRS FY 2000 - IMPROVE RIDEABILITY AND ADDRESS SAFETY/STRUCTURAL FLAGS ALONG THE ENTIRE VIADUCT TO INCLUDE DECK, JOINT, AND STEEL REPAIRS.OPERATION OF THE GOW BUS/HOV LINE
X730.89	I-278 GOWANUS EXPRESSWAY (VERRAZANO BRIDGE TO BATTERY TUNNEL) INTERIM EMERGENCY REPAIRS FY 2001 - IMPROVE RIDEABILITY AND ADDRESS SAFETY/STRUCTURAL FLAGS ALONG THE ENTIRE VIADUCT TO INCLUDE DECK, JOINT,& STEEL REPAIRS.OPERATION OF THE GOWANUS BUS/HOV LANE
X730.90	I-278 GOWANUS EXPRESSWAY INTERIM DECK PROJECT
X731.10	I-278 GOWANUS EXPRESSWAY INTERIM DECK PROJECT.
XM0030	ROUTINE CRACK FILLING AND PAVEMENT REPLACEMENT ON THE STATE ARTERIAL NETWORK.
XM0104	CITYWIDE BRIDGE PAINTING ON THE STATE ARTERIAL NETWORK.
XM0231	TAKEOVER OF MAINTENANCE RESPONSIBILITIES FOR VARIOUS STATE ARTERIALS
XM0431	CONTRACT MAINTENANCE SWEEPING TO REMOVE DEBRIS FROM PARKWAYS AND EXPRESSWAYS THROUGHOUT THE CITY.
XM9852	5 TO 7 BRIDGE REPAIR. REPLACE JOINTS, OVERLAY, AND BEARINGS. CONCRETE REPAIRS TO PIERS AND ABUTMENTS. MINOR MISCELLANEOUS REPAIRS ON VAN WYCK EXPRESSWAY.
X735.58	I-678 VAN WYCK EXPRESSWAY RESURFACING FROM LONG ISLAND EXPRESSWAY TO 73RD AVENUE
X804.28	SIGNING IMPROVEMENTS ALONG THE BELT PARKWAY IN BROOKLYN.
X805.38	VIADUCT PROTECTION, INVENTORY, PRIORITIZATION, AND FENCING CITYWIDE

XM0031	CONTRACT MAINTENANCE SWEEPING TO REMOVE DEBRIS FROM PARKWAYS AND EXPRESSWAYS THROUGHOUT THE CITY.
X501.27	CREATE A FIBER CABLE NETWORK TO CONNECT OUTER BOROUGHS TO TRAFFIC MANAGEMENT CENTER.
X822.84	NYC PRIVATE BUS PROGRAM: PURCHASE AND INSTALL CNG BUS FUELING STATION AT GREEN BUS LINE AND MODIFY THE FACILITY TO ACCOMMODATE CNG BUSES THAT WILL REPLACE DIESEL BUSES.

Chapter VII: Accidents and Safety

A. ACCIDENT DATA

Accident data for the most recent three-year period available from NYSDOT from January 1997 to December 1999 were obtained and used to identify 120 high accident locations.

New York State Department of Transportation's *Accident Event Data* provides accident event information such as location, severity type, accident type, date of the accident, day of the accident, time of the accident, case number, case year, collision type, road surface condition, weather condition, road character at the location of accident, traffic control present at the accident location, and light condition at the time of the accident. Separate *Vehicle Data* provides information about the type of vehicle and vehicle action involved in an accident. *Apparent Contributing Factor Data* provides information about the factors that could have possibly led to the accident.

In NYSDOT's *Accident Event Data* file, accidents are classified as either "reportable" or "non-reportable". In accordance with Section 603 of the New York State Vehicle and Traffic Law, all accidents involving death or injury must be reported to the NYSDOT Department of Motor Vehicles (DMV) by police agencies. Section 605 of the Vehicle and Traffic Law requires that drivers involved in accidents resulting in death, injury, or property damage in excess of $1,000 must also report the accident to DMV. These are referred to as "reportable" accidents.

Property Damage Only (PDO) accidents reported by the police agencies, but not by the involved motorists, are filed by the DMV as "non-reportable" accidents. PDO accidents are also filed as "non-reportable" if: (a) property damage is reported as less than $1,000, or (b) the amount of damage is not included in the motorist's report. These accidents are entered and retained in the computerized accident file by DMV, but with less detail than the "reportable" accidents. The only event information captured by DMV for "non-reportable" accidents is location and date. The total number of accidents at a location includes fatalities, injuries, PDOs, and non-reportable accidents.

Accidents occurring on the New York State highway system are placed in the State Accident Surveillance System (SASS) description file. For accidents occurring on the local highway systems, NYSDOT maintains the Centralized Local Accident Surveillance System (CLASS). This system is primarily geared toward providing data to meet the needs of local safety officials and agencies. Accident data files provided by NYSDOT contain both SASS (accidents located on state highways) and CLASS (accidents located on non-state highways) data.

1. Selection of 120 High Accident Locations

Vehicles traveling on high-volume roadways are typically exposed to more conflicts than vehicles traveling on low-volume roadways. Consequently, accident rates are typically

calculated to allow for a direct comparison of accident histories between high-volume and low-volume locations. In addition to the frequency of accidents occurring at a particular location, the accident rate calculations also require additional data, such as traffic volumes. The Average Annual Daily Traffic (AADT) volume is typically used for accident rate calculations.

However, because AADT data are not available for all of the top 120 accident locations, accident rate calculations and a comparison of accident rates were not performed. Instead, the top 120 high-accident locations were determined on the basis of total number of accidents (accident frequency) that occurred during the three-year study period at each location in the South Brooklyn TIS study area. Based on discussions with NYCDOT, accident rates based on frequency are, in general, comparable to those calculated using volumes. (Note: a ranking of accidents using rates and frequency may cause the order of the accident locations to vary but the inclusion of accident locations would most likely remain the same.)

B. ANALYSIS OF HIGH ACCIDENT LOCATIONS

Figure VII-1, High Accident Corridors, shows the "high accident corridors" with the top 120 high accident locations ranked by frequency. Accident locations ranked in the top 20 are shown in red; accident locations ranked between 21 and 40 are shown in orange; accident locations ranked between 41 and 60 are shown in purple; and accident locations ranked between 61 and 120 are shown in black. Figure VII-2 shows the total number of accidents during the three-year period (1997–1999) at these selected top 120 high accident locations.

As shown in both Figure VII-1, High Accident Corridors, and Figure VII-2, Total Accidents, the majority of high accident locations in Southern Brooklyn are located along major roadways. The major roadway corridors included in the top 120 accident locations are Shore Parkway, Linden Boulevard, Coney Island Avenue, Flatbush Avenue, Church Avenue, Gowanus Expressway, 65th Street, Kings Highway, Ocean Parkway, Flatlands Avenue, Bay Parkway, Utica Avenue, Foster Avenue, Neptune Avenue, Rockaway Parkway, and Pennsylvania Avenue (see Table VII-1).

Flatbush Avenue (showing eight accident locations in the top 120) was included in a Pedestrian Safety Mitigation Project, recently completed for the Brooklyn Borough President's Office.

FIGURE VII-1
HIGH ACCIDENT CORRIDORS

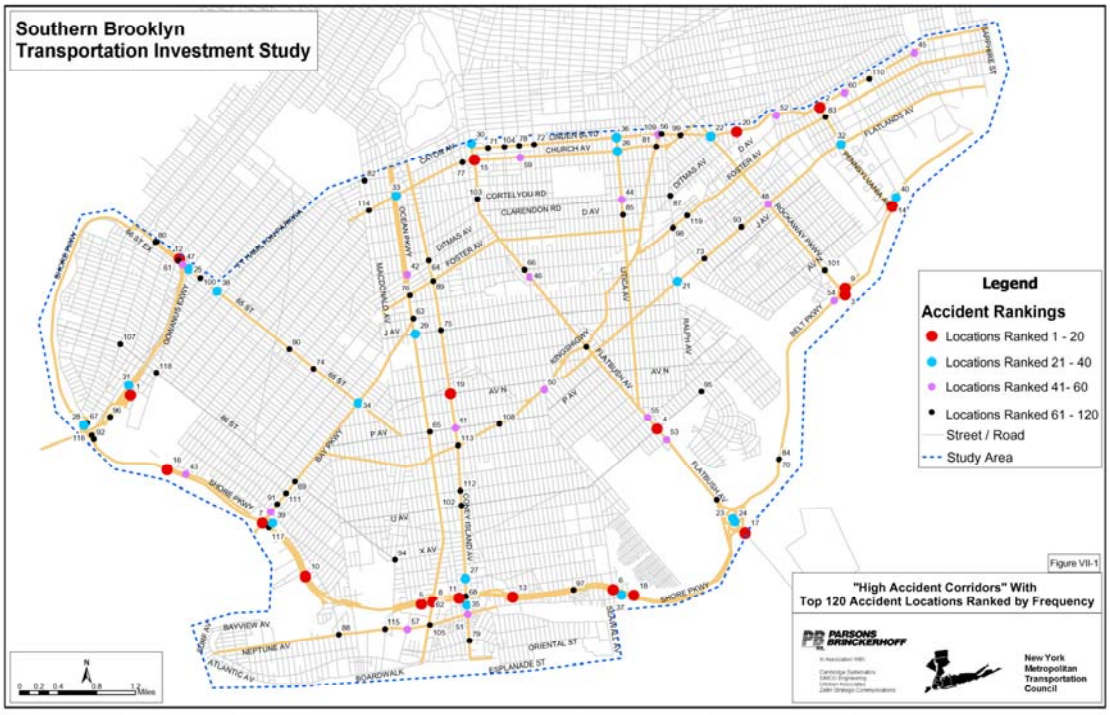


FIGURE VII-2
TOTAL ACCIDENTS

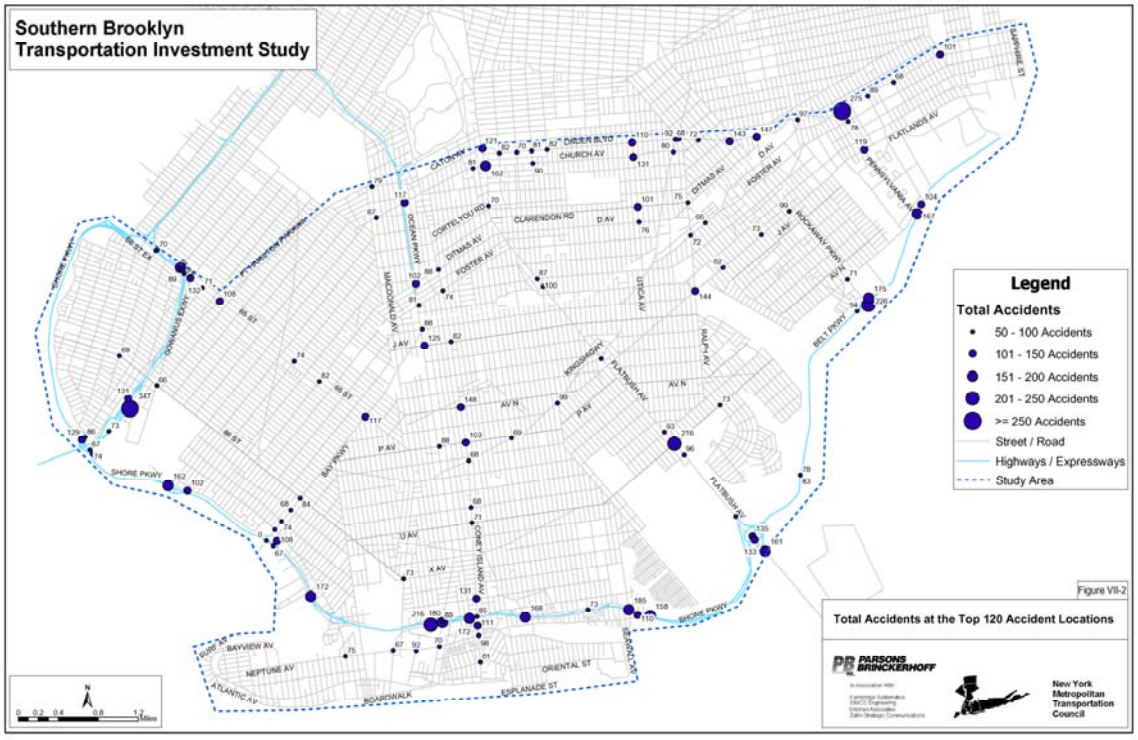


TABLE VII-1
NUMBER OF ACCIDENT LOCATIONS ALONG HIGH ACCIDENT CORRIDORS

Roadways	Number of High Accident Locations in the Top 120
Shore Parkway (mainline + ramps)	31
Linden Boulevard	13
Coney Island Avenue	12
Flatbush Avenue	8
Church Avenue	8
Gowanus Expressway (mainline + ramps)	7
65th Street	7
Kings Highway	6
Ocean Parkway	5
Flatlands Avenue	5
Bay Parkway	4
Utica Avenue	4
Foster Avenue	3
Neptune Avenue	3
Rockaway Parkway	3
Pennsylvania Avenue	3

1. Accident Frequency

Over the three-year study period (1997-1999), there were a total of 12,713 accidents at the top 120 accident locations. The total accidents include both the "reportable" (6,706) and "non-reportable" (6,007) accidents. Table VII-2 summarizes the frequency of accidents at each location by year and identifies each accident location by the following roadway types: mainline (M), ramp (R), and intersection (I). There were 3,989 accidents in 1997, 4,403 accidents in 1998, and 4,321 accidents in 1999. The table also shows that 14 (70 percent) out of the top 20 accident locations occurred either on expressways or expressway ramps with 13 of those accident locations occurring on Shore Parkway mainline and off ramps. Figure VII-3, Total Accidents by Roadway Type, and Table VII-3 show the number of accidents by roadway types. Of the total of 12,713 accidents that occurred, 10.1 percent occurred on mainlines, 29.1 percent occurred at ramps, and 60.9 percent occurred at intersections.

FIGURE VII-3
TOTAL ACCIDENTS BY ROADWAY TYPE

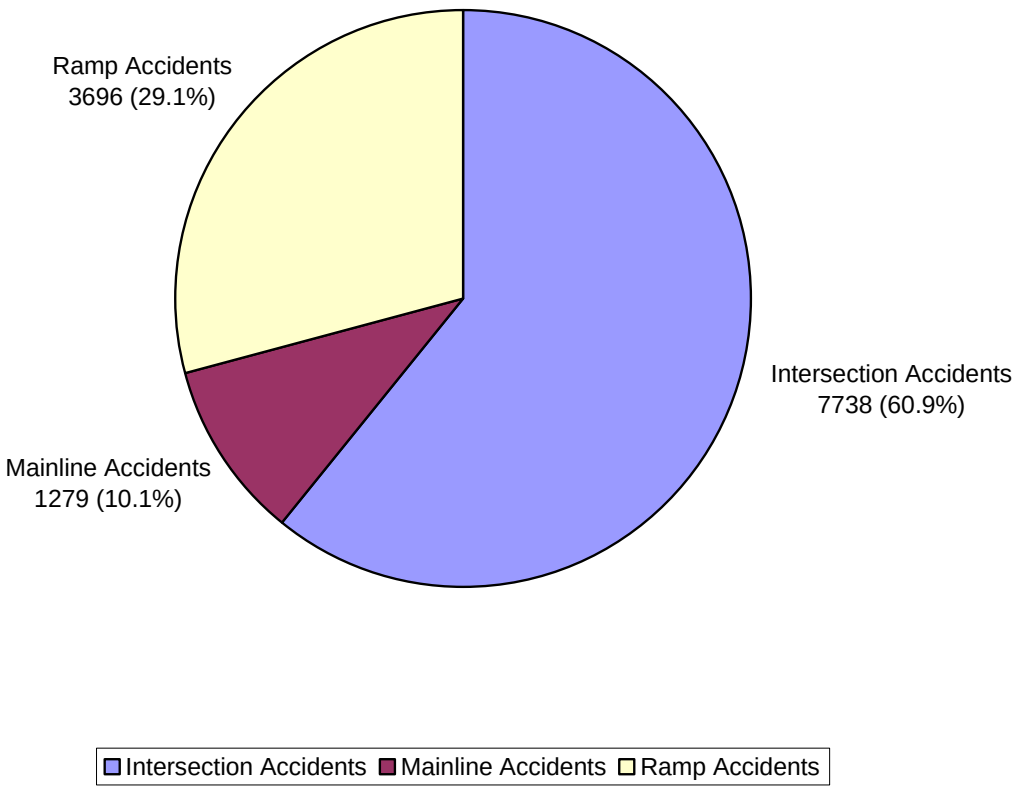


TABLE VII-2
TOP 120 ACCIDENT LOCATIONS RANKED BY FREQUENCY BY YEAR (1997-1999)

Ranking	Roadway Type	Location Description	Total	1999	1998	1997
1	R	GOWANUS EXPWY EB OFF RAMP TO 92ND ST	347	114	125	108
2	I	LINDEN BL AND PENNSYLVANIA AV	275	93	95	87
3	R	SHORE PKWY EB OFF RAMP TO ROCKAWAY PKWY	226	74	87	65
4	I	AVENUE U AND FLATBUSH AV	216	75	75	66
5	R	SHORE PKWY WB OFF RAMP TO SHELL ROAD	216	85	82	49
6	R	SHORE PKWY EB OFF RAMP TO KNAPP ST/SHEEPSHEAD BAY	185	61	55	69
7	R	SHORE PKWY EB OFF RAMP TO BAY PKWY	180	51	56	73
8	R	SHORE PKWY EB OFF RAMP TO SB OCEAN PKWY	180	52	53	75
9	R	SHORE PKWY EB OFF RAMP TO ROCKAWAY PKWY	175	63	61	51
10	M	SHORE PKWY EB 27TH AVE OVERPASS	172	59	55	58
11	R	SHORE PKWY EB OFF RAMP TO CONEY ISLAND AVE	172	73	59	40
12	I	6TH AV AND 65TH ST	168	54	48	66
13	M	SHORE PKWY WB SHEEPSHEAD BAY UNDERPASS	168	60	53	55
14	R	SHORE PKWY EB OFF RAMP TO PENNSYLVANIA AVE	167	46	64	57
15	I	FLATBUSH AV AND CHURCH AV	162	58	51	53
16	M	SHORE PKWY EB BAY 8 STREET OVERPASS	162	61	52	49
17	R	SHORE PKWY EB OFF RAMP TO FLATBUSH AVE	161	56	46	59
18	R	SHORE PKWY WB OFF RAMP TO KNAPP ST	158	53	61	44
19	I	AVENUE N AND CONEY ISLAND AV	148	41	45	62
20	I	LINDEN BL AND ROCKAWAY AV	147	42	54	51
21	I	FLATLANDS AV AND PAERDEGAT AV S	144	49	45	50
22	I	LINDEN BL AND ROCKAWAY PWKY	143	44	51	48
23	M	SHORE PKWY WB FLATBUSH AVE OVERPASS	135	40	49	46
24	R	SHORE PKWY EB OFF RAMP TO NB FLATBUSH AVE	133	47	51	35
25	I	7TH AV AND 65TH ST	132	46	41	45
26	I	UTICA AV AND CHURCH AV	131	37	48	46
27	I	AVENUE Z AND CONEY ISLAND AV	131	46	37	48
28	R	SHORE PKWY EB OFF RAMP TO FT HAMILTON PKWY/4TH AV	129	43	51	35
29	I	AVENUE J AND OCEAN PWKY	125	35	55	35
30	I	FLATBUSH AV AND CATON AV	121	38	53	30
31	R	GOWANUS EXPWY WB ON RMP FR 92ND ST/FT HAMILTON PKWY	121	46	41	34
32	I	PENNSYLVANIA AV AND FLATLANDS AV	119	45	39	35
33	I	CHURCH AV AND NY27	117	31	44	42
34	I	BAY PWKY AND 65TH ST	117	39	38	40
35	I	CONEY ISLAND AV AND RMP GUILDER AV TO SP	111	29	43	39
36	I	LINDEN BL AND UTICA AV	110	34	44	32
37	R	SHORE PKWY EB OFF RAMP TO KNAPP ST	110	37	40	33
38	I	FT HAMILTON PWKY AND 65TH ST	108	40	39	29
39	R	SHORE PKWY WB OFF RAMP TO BAY PKWY	108	32	45	31
40	R	SHORE PKWY WB OFF RAMP TO PENNSYLVANIA AVE	104	37	38	29
41	I	AVENUE P AND CONEY ISLAND AV	103	30	37	36
42	I	18TH AV AND OCEAN PWKY	102	32	33	37
43	R	SHORE PKWY WB OFF RAMP TO 14TH AVE/BAY 8TH ST	102	27	37	38
44	I	UTICA AV AND CLARENDON RD	101	42	30	29
45	I	LINDEN BL AND FOUNTAIN AV	101	32	37	32
46	I	NOSTRAND AV AND FLATBUSH AV	100	41	32	27
47	R	GOWANUS EXPWY EB OFF RAMP TO 65TH ST	100	27	45	28
48	I	FLATLANDS AV AND ROCKAWAY PWKY	99	34	30	35
49	I	CROPSEY AV AND BAY PWKY	99	32	39	28
50	I	NOSTRAND AV AND KINGS HW	99	30	34	35

TABLE VII-2 (CONTINUED)
TOP 120 ACCIDENT LOCATIONS RANKED BY FREQUENCY BY YEAR (1997-1999)

Ranking	Roadway Type	Location Description	Total	1999	1998	1997
51	I	EMMONS AV AND CONEY ISLAND AV	98	38	27	33
52	I	LINDEN BL AND VAN SINDEREN AV	97	41	36	20
53	I	AVENUE V AND FLATBUSH AV	96	33	36	27
54	R	SHORE PKWY WB ON RAMP FROM ROCKAWAY PKWY	94	44	33	17
55	I	AVENUE T AND FLATBUSH AV	93	27	40	26
56	I	LINDEN BL AND KINGS HW	92	21	34	37
57	I	NEPTUNE AV AND W 5TH ST	92	35	32	25
58	M	GOWANUS EXPRESSWAY EASTBOUND	92	37	22	33
59	I	NOSTRAND AV AND CHURCH AV	90	26	34	30
60	I	LINDEN BL AND VAN SICLEN AV	89	28	29	32
61	M	GOWANUS EXPWY EB6TH AVE UNDERPASS	89	27	40	22
62	M	SHORE PKWY EB OCEAN PARKWAY UNDERPASS	89	27	33	29
63	I	AVENUE I AND OCEAN PWKY	88	20	38	30
64	I	CONEY ISLAND AV AND 18TH AV	88	26	27	35
65	I	AVENUE P AND OCEAN PWKY	88	20	39	29
66	I	GLENWOOD RD AND E 29TH ST	87	30	24	33
67	R	SHORE PKWY WB OFF RAMP TO 4TH AV/FT HAMILTON PKWY	86	42	23	21
68	R	SHORE PKWY WB OFF RAMP TO NB OCEAN PKWY	85	32	29	24
69	I	BAY PWKY AND 86TH ST	84	27	31	26
70	M	SHORE PKWY EB MILL BASIN UNDERPASS	83	37	18	28
71	I	CATON AV AND BEDFORD AV	82	28	24	30
72	I	LINDEN BL AND NEW YORK AV	82	41	17	24
73	I	FLATLANDS AV AND E 80TH ST	82	35	23	24
74	I	18TH AV AND 65TH ST	82	27	33	22
75	I	AVENUE J AND CONEY ISLAND AV	82	29	28	25
76	I	FOSTER AV AND OCEAN PWKY	81	21	28	32
77	I	CHURCH AV AND OCEAN AV	81	25	30	26
78	I	LINDEN BL AND NOSTRAND AV	81	35	27	19
79	I	CONEY ISLAND AV AND BRIGHTON BEACH AV	81	32	25	24
80	I	4TH AV AND 65TH ST	80	26	27	27
81	I	CHURCH AV AND KINGS HW	80	20	25	35
82	I	MC DONALD AV AND CATON AV	79	35	16	28
83	I	STANLEY AV AND PENNSYLVANIA AV	78	28	28	22
84	M	SHORE PKWY WB MILL BASIN UNDERPASS	78	37	25	16
85	I	AVENUE D AND UTICA AV	76	30	28	18
86	R	SHORE PKWY WB OFF RAMP TO FLATBUSH AVE	76	28	30	18
87	I	RALPH AV AND CLARENDON RD	75	22	28	25
88	I	NEPTUNE AV AND W 17TH ST	75	27	31	17
89	I	FOSTER AV AND CONEY ISLAND AV	74	18	35	21
90	I	16TH AV AND 65TH ST	74	21	28	25
91	I	BATH AV AND BAY PWKY	74	27	28	19
92	R	SHORE PKWY WB OFF RAMP TO WB I-278/VERRAZANO BR	74	41	25	8
93	I	FLATLANDS AV AND REMSEN AV	73	33	20	20
94	I	AVENUE X AND 86TH ST	73	30	24	19
95	I	AVENUE U AND MILL AV	73	22	21	30
96	R	GOWANUS EXPWY EB OFF RMP TO EB BELT PKWY/JFK AIRPORT	73	18	28	27
97	M	SHORE PKWY EB NOSTRAND AVE UNDERPASS	73	32	19	22
98	I	RALPH AV AND FOSTER AV	72	23	29	20
99	I	LINDEN BL AND CHURCH AV	72	19	30	23
100	I	8TH AV AND 65TH ST	71	27	21	23

TABLE VII-2 (CONTINUED)
TOP 120 ACCIDENT LOCATIONS RANKED BY FREQUENCY BY YEAR (1997-1999)

Ranking	Roadway Type	Location Description	Total	1999	1998	1997
101	I	SEAVIEW AV AND ROCKAWAY PWKY	71	24	19	28
102	I	AVENUE U AND CONEY ISLAND AV	71	30	24	17
103	I	FLATBUSH AV AND BEVERLY RD	70	15	32	23
104	I	LINDEN BL AND ROGERS AV	70	23	21	26
105	I	NEPTUNE AV AND OCEAN PWKY	70	24	26	20
106	M	GOWANUS EXPWY 4TH AVE OVERPASS	70	30	21	19
107	I	4TH AV AND 86TH ST	69	28	26	15
108	I	OCEAN AV AND KINGS HW	69	30	22	17
109	I	LINDEN BL AND REMSEN AV	68	27	19	22
110	I	LINDEN BL AND ASHFORD ST	68	27	19	22
111	M	BAY PWKY AND BAY PWKY	68	18	31	19
112	I	CONEY ISLAND AV BETWEEN AVE T & AVE U	68	21	21	26
113	I	CONEY ISLAND AV AND KINGS HW	68	22	20	26
114	I	MC DONALD AV AND CHURCH AV	67	27	21	19
115	I	NEPTUNE AV AND W 8TH ST	67	24	19	24
116	R	SHORE PKWY EB ON RAMP FROM EB I-278/VERRAZANO BR	67	34	26	7
117	R	SHORE PKWY EB ON RAMP FROM BAY PKWY	67	23	28	16
118	I	7TH AV AND 86TH ST	66	19	16	31
119	I	FOSTER AV AND E 83RD ST	66	10	35	21
120	I	FLATBUSH AV AND KINGS HW	66	17	28	21

TABLE VII-3
TOTAL NUMBER OF ACCIDENTS BY ROADWAY TYPES (1997-1999)

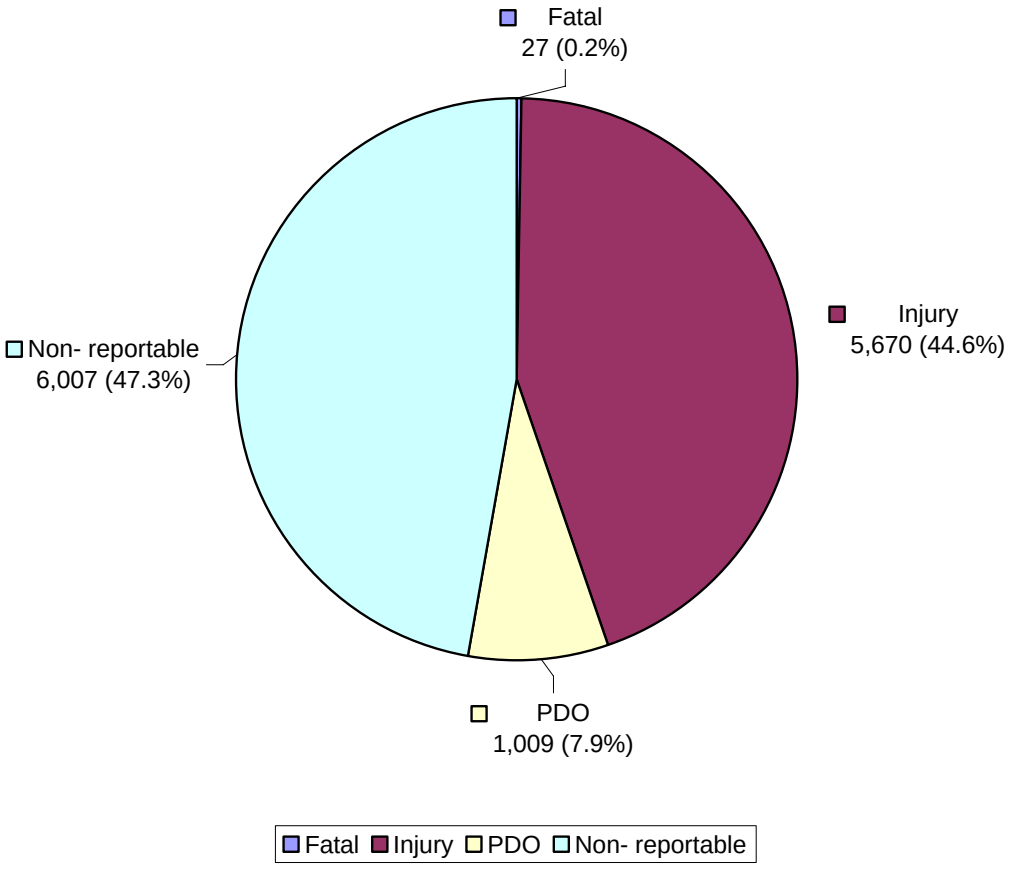
Roadway Type	Accident Locations by Roadway Type	% of Accident Locations by Roadway Type	Accidents by Roadway Type	% of Accidents by Roadway Type
Mainline	13	10.8 percent	1,279	10.1 percent
Ramp	26	21.7 percent	3,696	29.1 percent
Intersection	81	67.5 percent	7,738	60.9 percent
TOTAL	**120**	**100 percent**	**12,713**	**100 percent**

The total number of accidents occurring on mainlines (10.1 percent) very closely matches the total number of accident locations on mainlines (10.8 percent). This correlation between roadway type and number of accidents is also shared by ramps and intersections.

2. Accident Severity

The summary of number of accidents by accident severity, including fatal, injury, PDO and non-reportable accidents is shown in Figure VII-4, Total Accidents by Accident Severity. Over the three-year study period, there were 27 fatal accidents (0.2 percent), 5,670 accidents (44.6 percent) resulted in injuries, and 1,009 accidents (7.9 percent) involved property damage only for a total of 6,706 reportable accidents. Non-reportable accidents accounted for 6,007 (47.3 percent) of the total accidents at the study locations. A summary of each accident location by accident severity is provided in Appendix E.

FIGURE VII-4
TOTAL ACCIDENTS BY ACCIDENT SEVERITY



a. Accident Severity by Roadway Type

Out of 1,279 mainline accidents, there were six fatal accidents during the three-year study period accounting for 0.5 percent of the total mainline accidents. Injuries (563) and PDO (140) accidents accounted for 44.6 percent and 10.9 percent of the total mainline accidents, respectively. There were 570 non-reportable accidents on mainlines during the three-year study period which accounted for 44.6 percent of the total accidents. Figure VII-5, Mainline Accidents by Accident Severity, shows the mainline accidents by accident severity.

Accident occurrence on expressway ramps generally followed the same pattern as on mainlines. There were 3,696 accidents that occurred on expressway ramps during the three-year study period. Of those, there were eight fatal accidents that accounted for 0.2 percent of the total ramp accidents. Injuries (1,572) and PDO (374) accidents accounted for 42.5 percent and 10.1 percent of the total ramp accidents, respectively. There were 1,742 non-reportable accidents during the study period which accounted for 47.1 percent of the total ramp accidents. Figure VII-6, Ramp Accidents by Accident Severity, shows the ramp accidents by accident severity.

Accidents occurring at intersections also followed the same pattern. There were 13 fatal accidents accounted for 0.2 percent of the total 7,738 intersection accidents during the three-year study period. Injuries (3,535) and PDO (495) accidents accounted for 45.7 percent and 6.4 percent of the total intersection accidents, respectively. There were 3,695 non-reportable accidents during the three-year period which accounted for 47.8 percent of the total intersection accidents. Figure VII-7, Intersection Accidents by Accident Severity, shows the intersection accidents by accident severity.

3. Collision Types

An analysis of the reportable accidents for the three-year study period (1997-1999) revealed that the most frequently occurring type of accident in the study area was rear-end collision (2,012) which accounted for 30.0 percent of the total accidents (see Figure VII-8, Total Accidents by Collision Types). Other predominant accident types included 792 right angle collisions (11.8 percent) followed by 736 overtaking collisions (11.0 percent) and 679 left-turn collisions (10.1 percent).

During the three-year study period, there were 515 pedestrian accidents and 153 bicycle accidents which accounted for 7.7 percent and 2.3 percent of the total accidents, respectively. Figure VII-9, Pedestrian Accidents, shows the total number of pedestrian accidents at the top 120 high accident locations and Figure VII-10, Bicycle Accidents, shows the total number of bicycle accidents at the top 120 high accident locations.

Right-turn collisions (2.1 percent) and sideswipe collisions (1.1 percent) were also common types of accidents. The remaining accidents were either unknown or were grouped as “other accident types.” A summary of each accident location by collision type is provided in Appendix E.

FIGURE VII-5
MAINLINE ACCIDENTS BY ACCIDENT SEVERITY

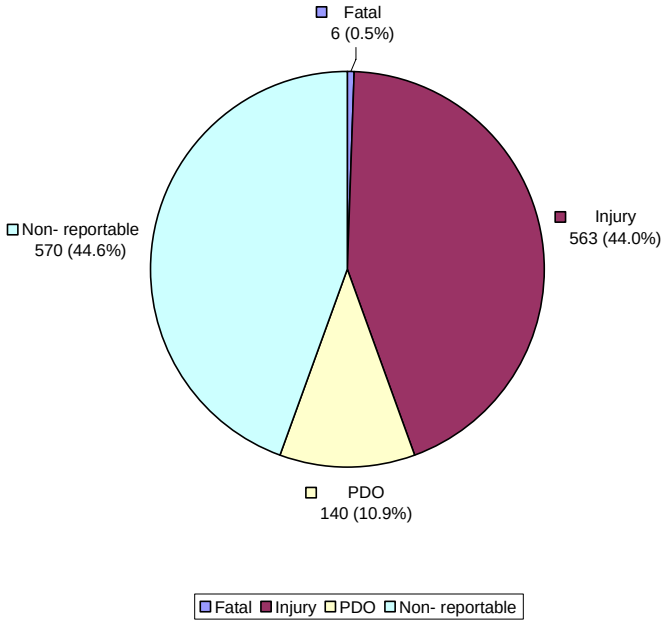


FIGURE VII-6
RAMP ACCIDENTS BY ACCIDENT SEVERITY

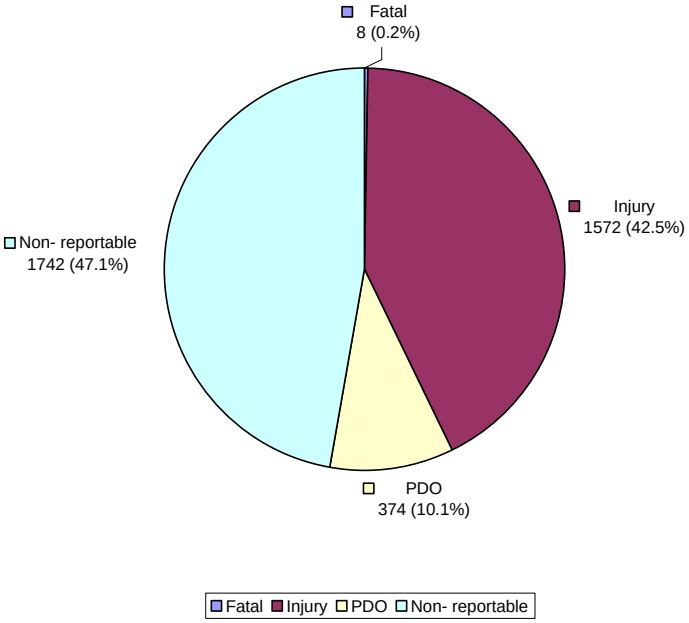


FIGURE VII-7
INTERSECTION ACCIDENTS BY ACCIDENT SEVERITY

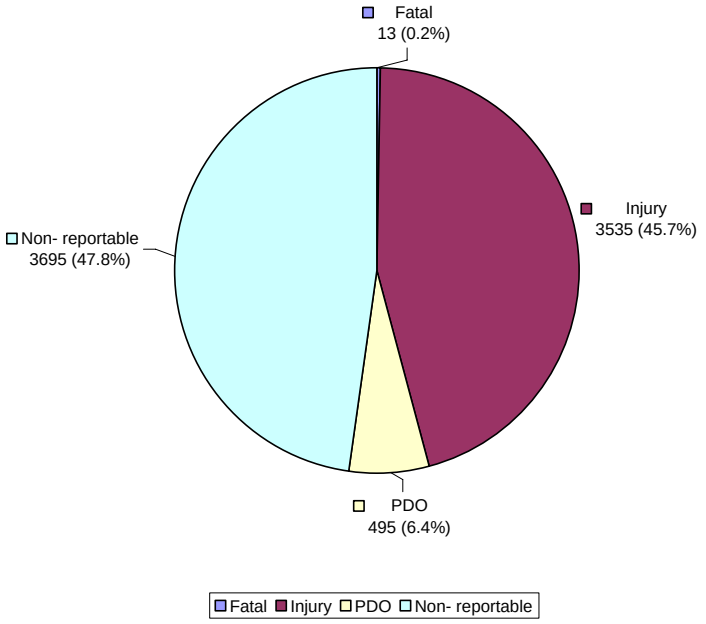


FIGURE VII-8
TOTAL ACCIDENTS BY COLLISION TYPES

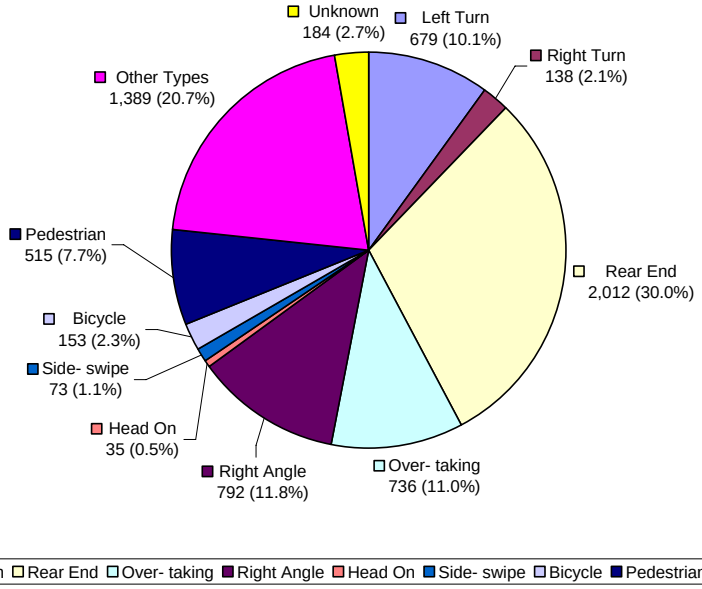


FIGURE VII-9
PEDESTRIAN ACCIDENTS

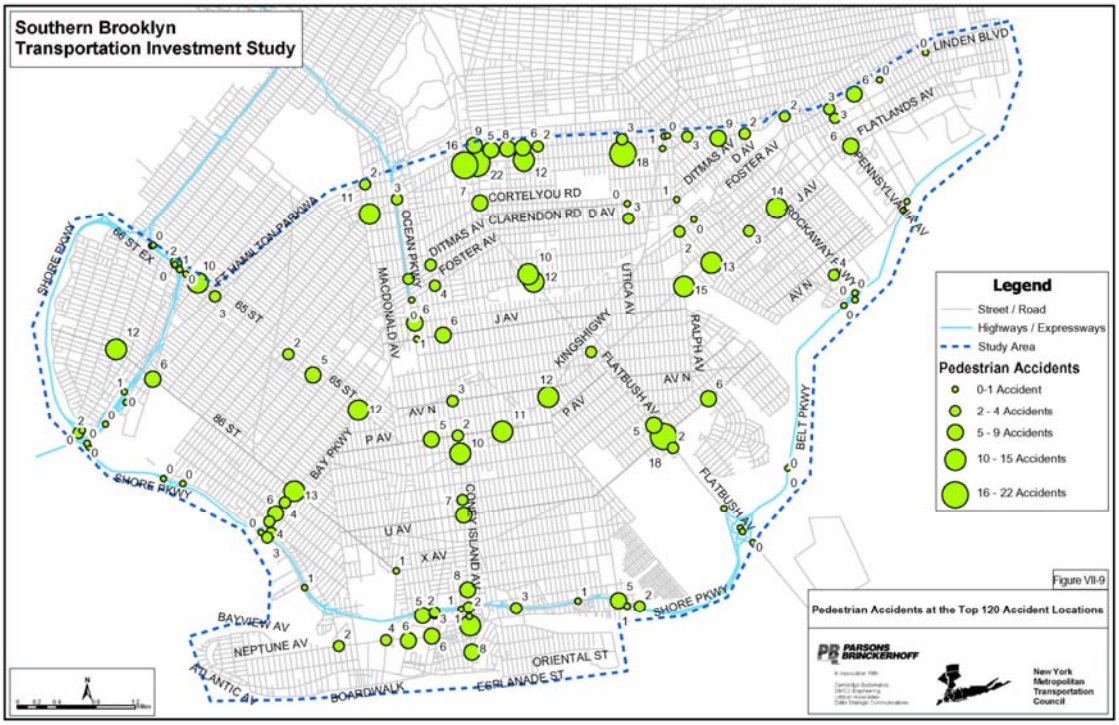
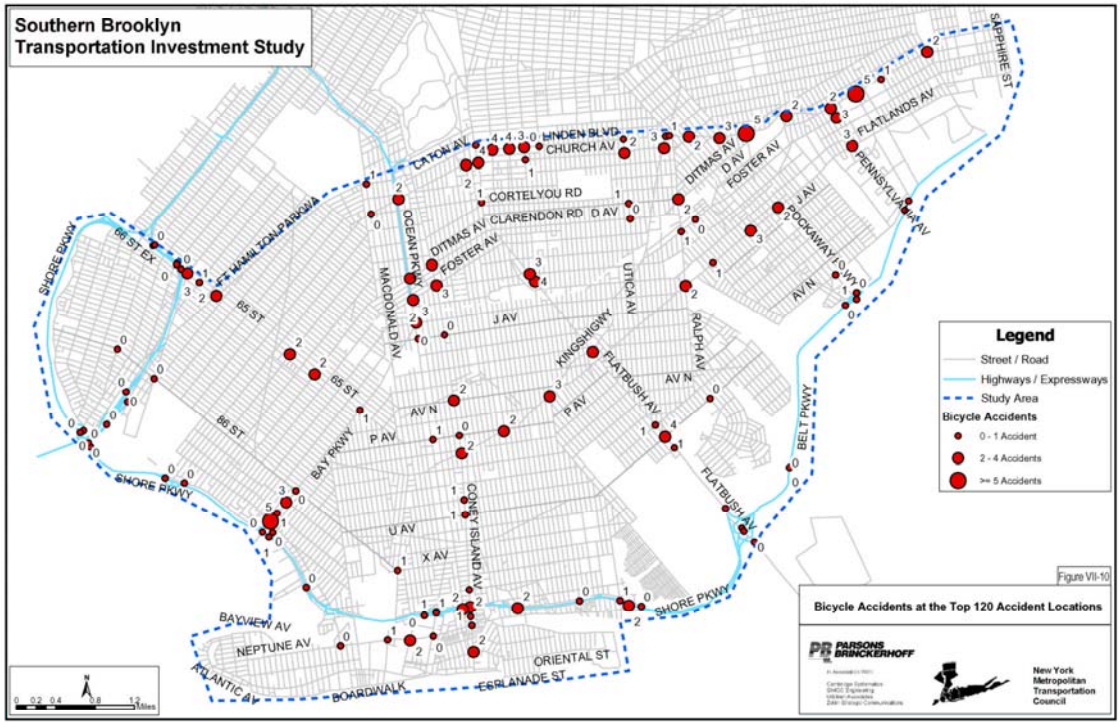


FIGURE VII-10
BICYCLE ACCIDENTS



a. Collision Types by Roadway Type

Figure VII-11, Mainline Accidents by Collision Types, shows that the accidents on expressway mainlines were primarily rear-end collisions (312) which accounted for 44 percent of the total mainline accidents. The other predominant accident type was overtaking collisions (85) which accounted for 12 percent of the total mainline accidents. Sideswipe collisions accounted for 1.0 percent of the total mainline accidents. During the three-year study period, there were 11 pedestrian accidents and six bicycle accidents on mainlines which accounted for 1.6 percent and 0.6 percent of the total mainline accidents, respectively.

The most common type of accident occurring on expressway ramps was also rear-end collisions (867) accounting for 44.4 percent of the total ramp accidents. The second most common type of accident was overtaking (259) which accounted for 13.3 percent of the total ramp accidents. During the three-year study period, there were 36 pedestrian accidents and 11 bicycle accidents which accounted for 1.8 percent and 0.6 percent of the total ramp accidents, respectively. Sideswipe collisions (12) accounted for 0.6 percent of the total ramp accidents. Figure VII-12, Ramp Accidents by Collision Types, shows the number of ramp accidents by collision types.

The most common type of accident occurring at intersections was rear-end collisions (833) accounting for 20.6 percent of the total intersection accidents. The other predominant accident types were right angle collisions (792), left-turn collisions (679) and overtaking collisions (392) which accounted for 19.6 percent, 16.8 percent and 9.7 percent, respectively, of the total intersection accidents. There were 468 pedestrian accidents and 136 bicycle accidents which accounted for 11.6 percent and 3.4 percent of the total intersection accidents. Right-turn collisions (3.4 percent), sideswipes collisions (1.3 percent), and head-on collisions (0.9 percent) were also common types of accidents. Figure VII-13, Intersection Accidents by Collision Types, shows the number of intersection accidents by collision types.

4. Weather Conditions

The weather conditions reported at the time of accidents are summarized and shown in Figure VII-14, Accidents by Weather Conditions. The majority of the accidents (4,346) occurred during clear weather conditions and accounted for 64.8 percent of the total reportable accidents. Out of 6,706 reported accidents, 1,109 (16.5 percent) occurred when it rained and 763 (11.4 percent) occurred when it was cloudy. Conditions such as snow; sleet/hail/freezing rain; and fog/smoke/smog together accounted for 1.4 percent of the total reportable accidents. A summary of weather conditions at each accident location is provided in Appendix E.

FIGURE VII-11
MAINLINE ACCIDENTS BY COLLISION TYPES

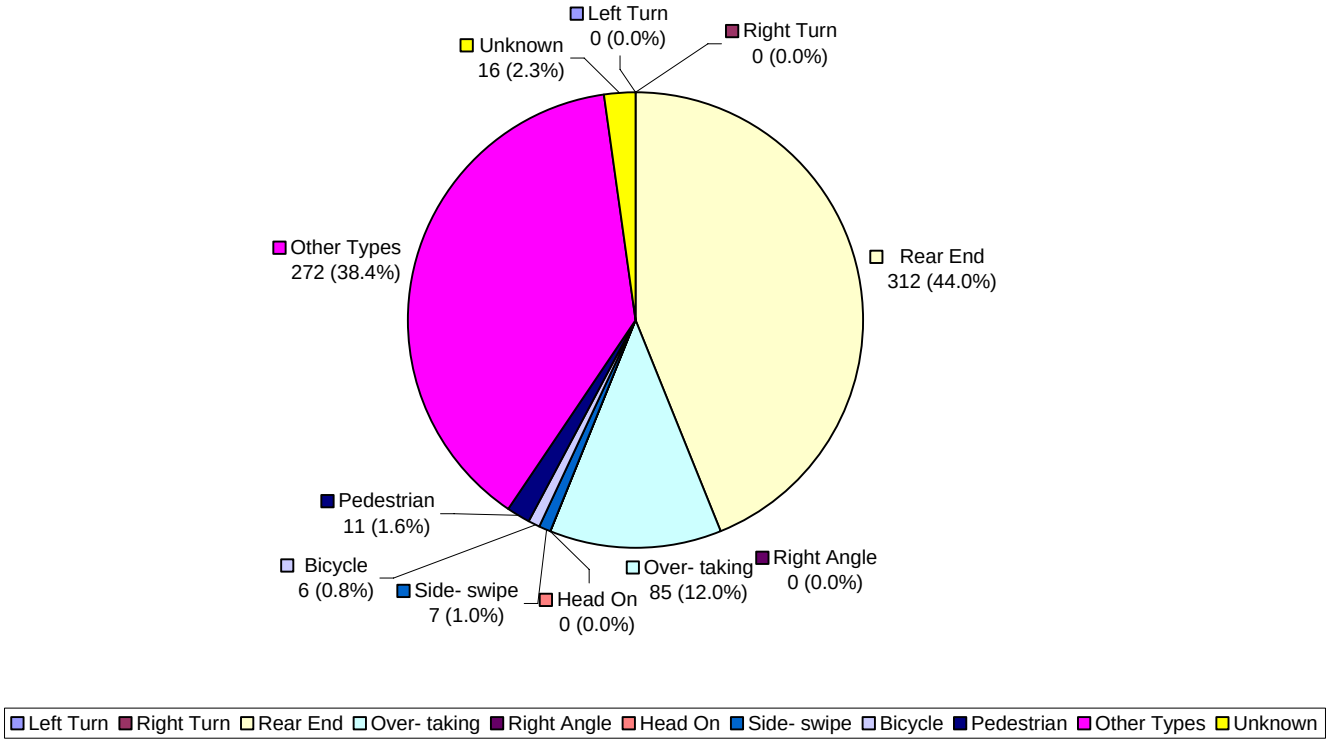


FIGURE VII-12
RAMP ACCIDENTS BY COLLISION TYPES

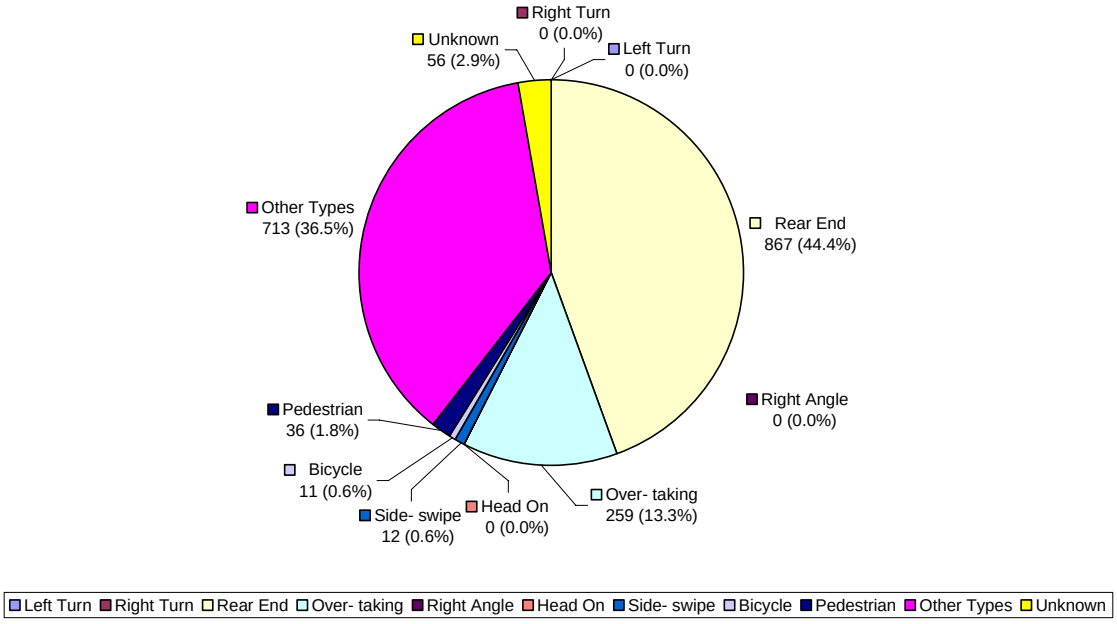


FIGURE VII-13
INTERSECTION ACCIDENTS BY COLLISION TYPES

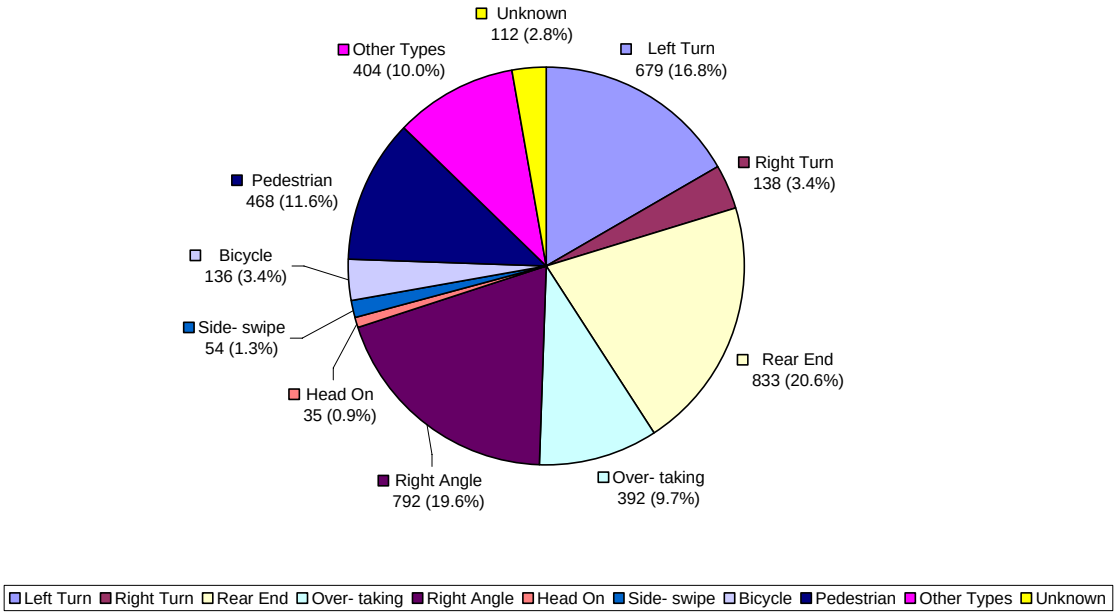
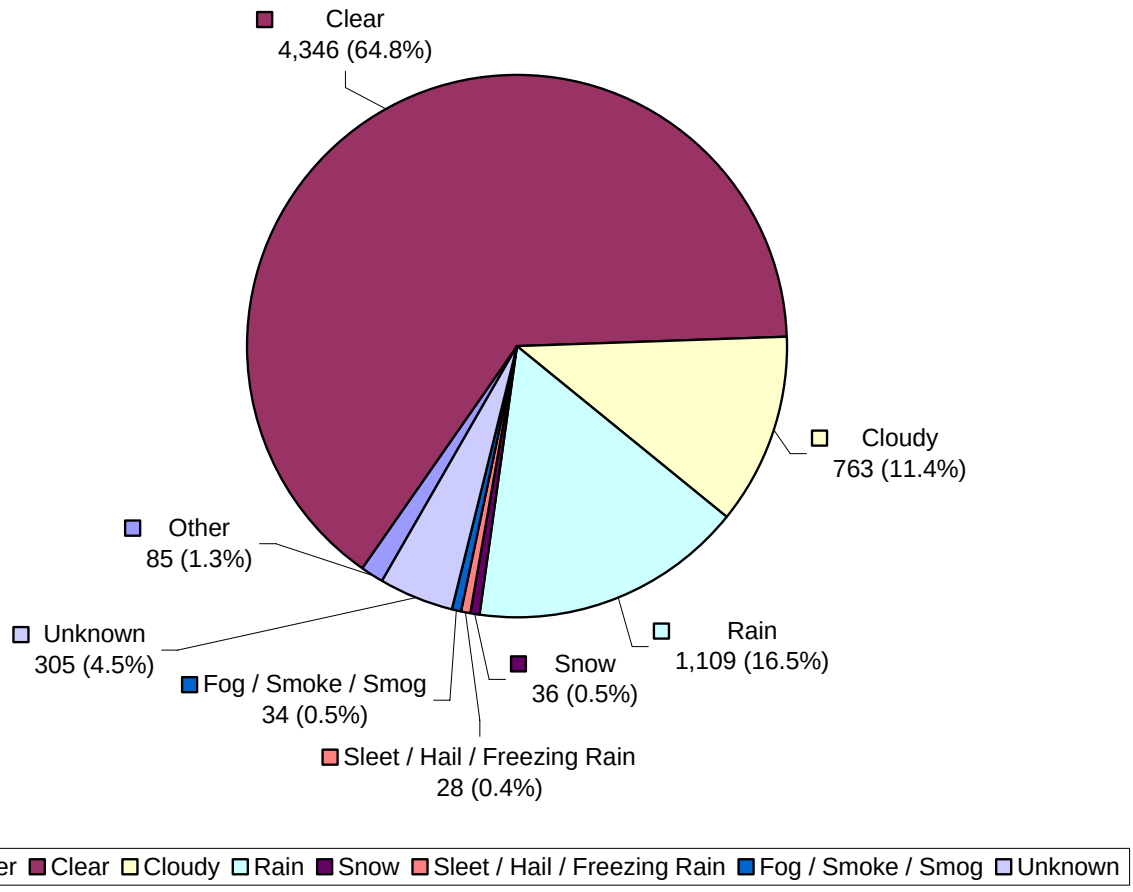


FIGURE VII-14
ACCIDENTS BY WEATHER CONDITIONS



5. Pavement Conditions

Figure VII-15, Accidents by Pavement Conditions, shows the summary of pavement conditions for 6,706 reportable accidents. Of the total number of accidents, 4,797 or 71.5 percent occurred on dry pavement. Approximately 21.7 percent of the reportable accidents occurred on wet pavement and one percent of the total reportable accidents occurred on pavement with snow/ice, slush, or mud. A summary of pavement conditions at each accident location is provided in Appendix E.

6. Light Conditions

The light conditions reported at the time of accidents are summarized in Figure VII-16, Accidents by Lighting Conditions. The majority of accidents (3,592) occurred during daylight and accounted for 53.6 percent of the total reportable accidents. Accidents occurring during dark conditions accounted for 29 percent of the total reportable accidents. Approximately 3.8 percent reportable accidents occurred at dusk and 1.6 percent occurred at dawn. A summary of light conditions at each study location is provided in Appendix E.

7. Time of Day

The time of day during which the accidents occurred at each study intersection are shown in Figure VII-17, Accidents by Time of Day. There were total 1,197 accidents occurred during three-hour period between 4 PM and 7 PM which accounted for 17.8 percent of the total reportable accidents. Approximately 26.6 percent of the reportable accidents occurred between the hours of 10 AM – 4 PM; 12.5 percent occurred between the hours of 6 AM – 10 AM; 19.8 percent occurred between the hours of 7 PM – 12 AM; and about 19.8 percent occurred between the hours of 12 AM – 6 AM. The number of accidents reported during 7 PM – 12 AM and 12 AM – 6 AM appears to be disproportionately high. The time of day summary at each study location is provided in Appendix E.

8. Day of Week

The day of the week during which the accidents occurred at study intersections are shown in Figure VII-18, Accidents by Day of Week. The number of accidents occurred on Fridays (16 percent) were relatively higher than those occurred on other days of the week. The rest of the accidents occurred with a relatively even distribution on Sunday (14.9 percent), Saturday (14.6 percent), Thursday (14.4 percent), Wednesday (14.2 percent), Tuesday (13.2 percent), and Monday (12.9 percent). The time of the week summary at each accident location is provided in Appendix E.

FIGURE VII-15
ACCIDENTS BY PAVEMENT CONDITIONS

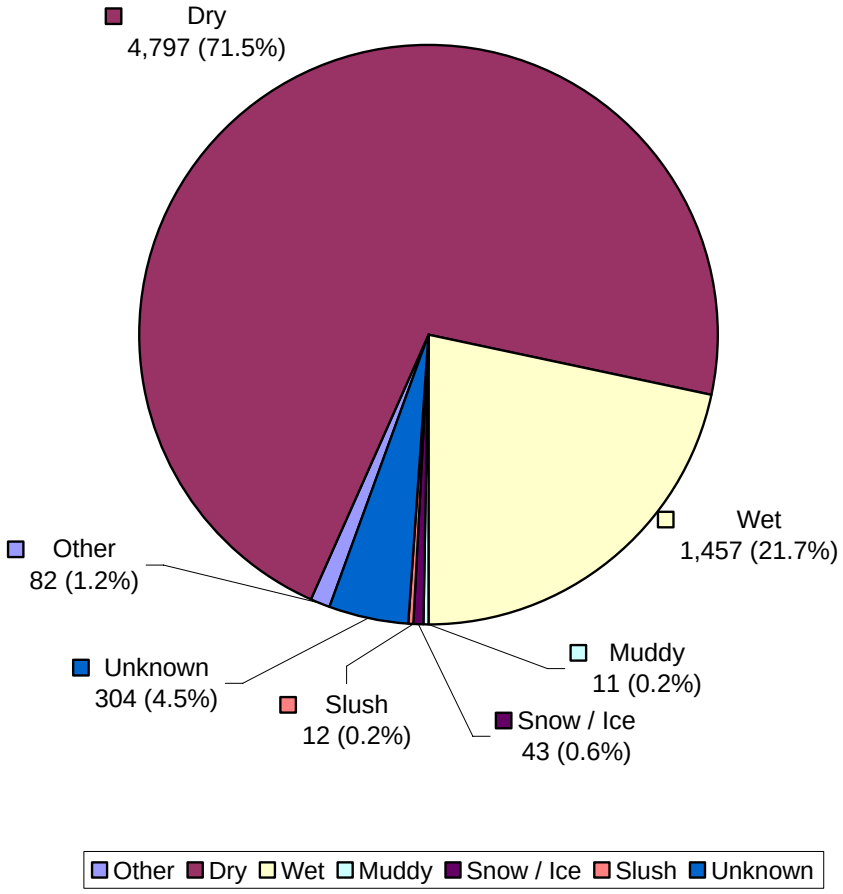


FIGURE VII-16
ACCIDENTS BY LIGHTING CONDITIONS

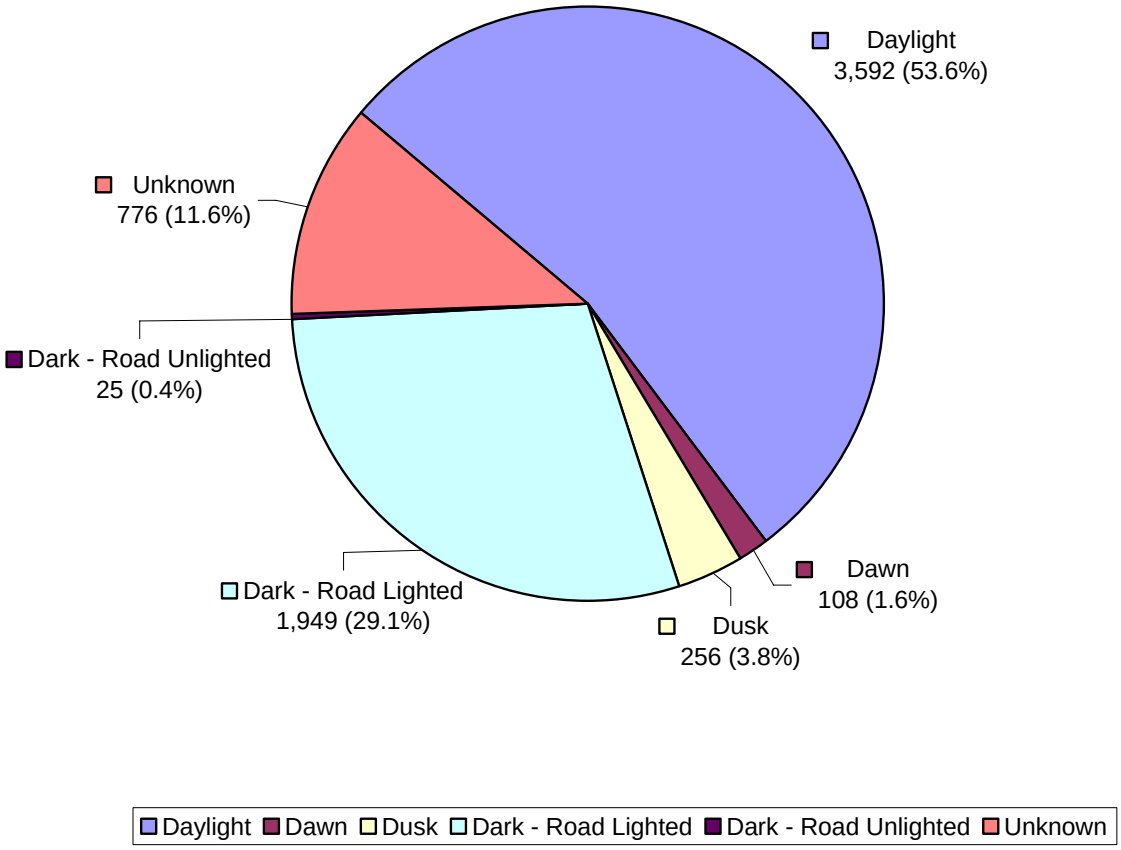


FIGURE VII-17
ACCIDENTS BY TIME OF DAY

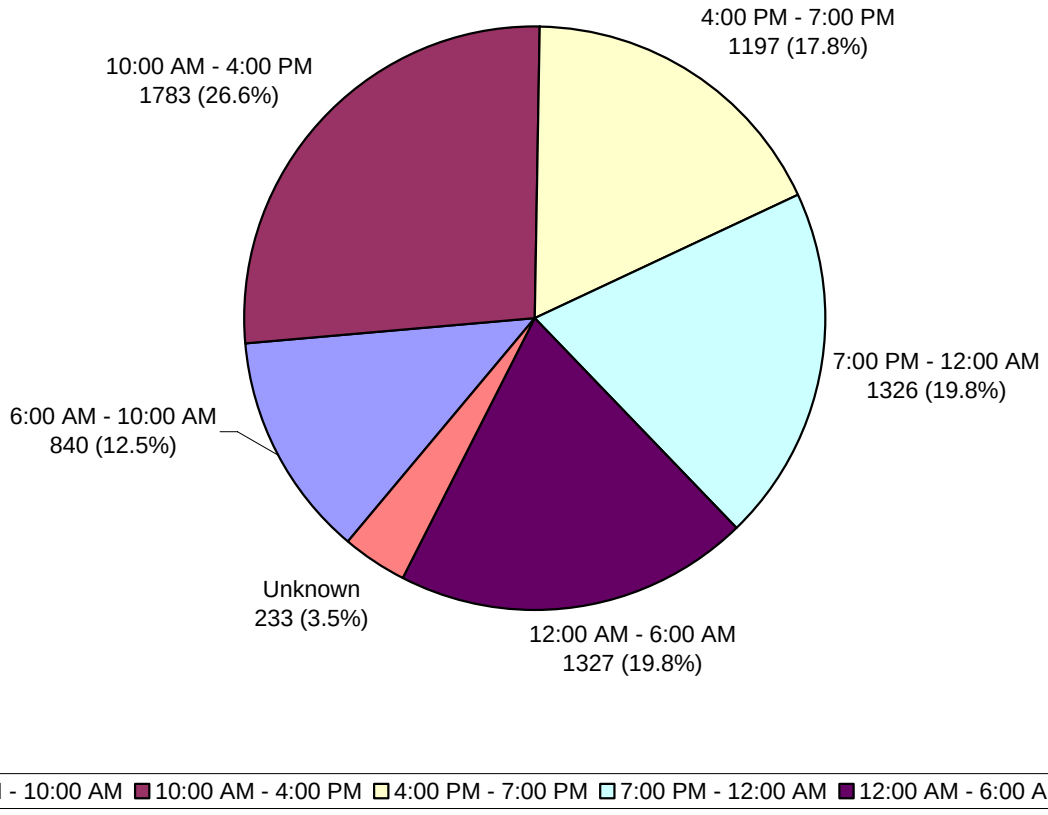
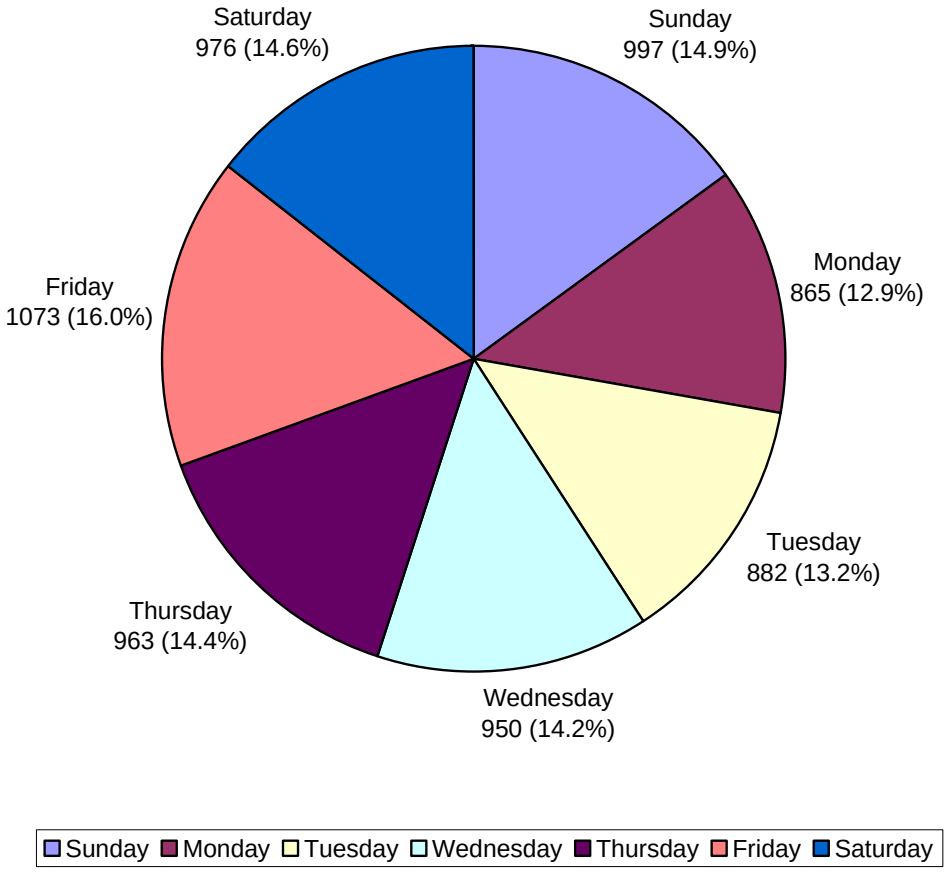


FIGURE VII-18
ACCIDENTS BY DAY OF WEEK



9. Vehicle Types

The number of vehicles involved in reportable accidents by vehicles types is presented in Figure VII-19, Vehicles Involved in Accidents by Vehicle Types. The passenger vehicle (motorcycles/cars/vans/pickups) accounted for 11,992 or 86.7 percent of the total vehicles involved in the reportable accidents. Trucks represented about 3.0 percent of the total vehicles involved in the reportable accidents. The majority of "high accident corridors", shown in Figure VII-1, are also major truck routes. Figure III-1, SBTIS Truck Routes shows the *Truck Route Network* in Brooklyn. There were 78 buses involved in accidents during the three-year period which accounted for 0.6 percent of the total number of vehicle involved in reportable accidents. The number of vehicles involved in accidents by vehicle types at each study location is provided in Appendix E.

C. SUMMARY OF FINDINGS

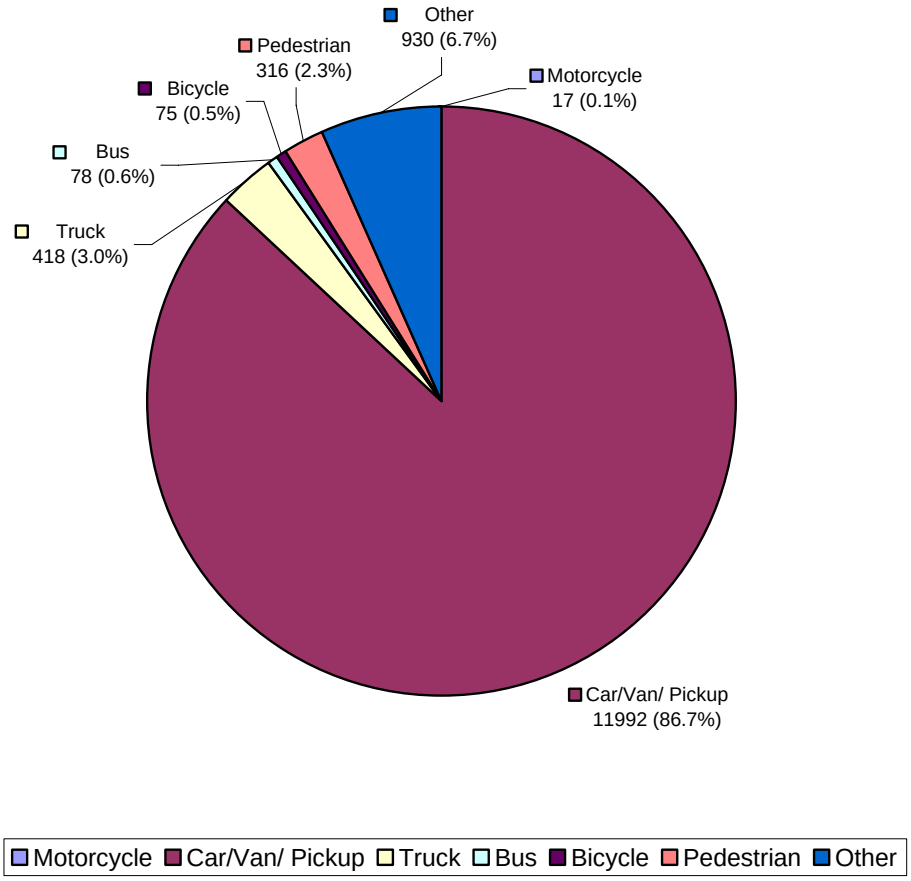
The top 120 accident locations indicate that the majority of high accident locations in Southern Brooklyn are located along major roadways, including Shore Parkway, Linden Boulevard, Coney Island Avenue, Flatbush Avenue, Church Avenue, Gowanus Expressway, 65th Street, and Kings Highway. While the majority of the "high accident corridors" are also major truck routes, approximately 87 percent of the total vehicles involved in the reportable accidents were passenger vehicles.

Although a higher total number of accidents occurred at intersections, as compared to ramps and mainlines, 70 percent of the top 20 accident locations occurred on expressways or expressway ramps, most notably Shore Parkway. The high number of accident locations along Shore Parkway may, in part, be due to substandard features that exist along this arterial such as substandard deceleration and acceleration lanes.

The most frequent accident type in the study area was rear-end collision. Rear-end collisions accounted for the majority of mainline, expressway ramp, and intersection accidents. Rear-end collisions are commonly due to the following conditions such as a slippery surface, large number of turning vehicles, poor visibility of signals, inadequate signal timing, inadequate roadway lighting, crossing pedestrians, insufficient "clearance" time, or congestion.

As shown in Figure VII-1, accident patterns reveal that certain roadway corridors are more accident–prone than others. These "high accident corridors" should be studied in further detail to identify "general" deficiencies and corresponding, generalized accident countermeasures. Pedestrian accidents, accounting for 7.7 percent of the total accidents, and bicycle accidents, accounting for 2.3 percent of the total accidents, also occurred along these "high accident corridors". Specific top pedestrian accident locations, such as intersections along Flatbush Avenue and Church Avenue, and specific top bicycle accident locations, such as intersections along Linden Boulevard and Bay Parkway, should be examined in greater detail to determine the type of unique roadway and traffic factors that may contribute to crashes involving pedestrians and bicycles; this will require examining both the crash statistics as well as traffic volumes and roadway geometry.

FIGURE VII-19
VEHICLES INVOLVED IN ACCIDENTS BY VEHICLE TYPES



Chapter VIII: Pedestrian/Bicycle Transportation

A. EXISTING BICYCLE ROUTES

The study area contains a wide range of bicycle and pedestrian facilities and some of the most famous greenways and linear open spaces in the city. These range from the historic tree-lined Ocean Parkway to scenic waterfront greenways and paths such as the Coney Island Boardwalk and the Shore Parkway Path. Future planned greenway and bicycle and pedestrian improvements are key to expanding the range of recreational and alternative transportation offerings in the study area. Current information about existing bicycle lanes and greenways in the study area described below was obtained from the *NYC Cycling Map* (2002) developed by NYCDCP and the NYCDOT Bicycle Program (see Figure VIII-1, NYC Cycling Map).

BICYCLE FACILITIES IN THE STUDY AREA INCLUDE THE OCEAN PARKWAY BICYCLE PATH

1. Bicycle Lanes

- **Bedford Avenue** (Emmons Avenue – Bergen Street): 6.3 miles
  The Bedford Avenue bicycle lane provides a north-south connection between northern Brooklyn and both Coney Island and Shore Parkway.

- **Sunset Park Connector Route** (Prospect Park – Owls Head Park): 5 miles
  The Sunset Park Connector provides an on-street link between Prospect Park, Brooklyn-Queens Greenway (an existing greenway in northern Brooklyn), Sunset Park, and the Shore Parkway Greenway. This Class II bike lane roughly follows the southeast side of Greenwood Cemetery to 7th Avenue and then down to 66th Street to connect with the Shore Parkway Greenway.

FIGURE VIII-1
NYC CYCLING MAP

- **Shore Parkway Signed On-Street Routes**: 8.6 miles
  - — Shore Parkway/Stillwell Avenue (Bay Parkway – West 5th Street)
    These northbound and southbound bicycle routes allow for connection between the western segment of Shore Parkway to both Ocean Parkway and the Coney Island Boardwalk.
  - — Neptune Avenue/Emmons Avenue (Ocean Parkway – Knapp Street)
    This east-west bicycle route allows for connection between the eastern segment of the Shore Parkway to both Ocean Parkway and the Coney Island Boardwalk.

These signed on-street routes close the gap on the Shore Parkway Greenway between Bay Parkway and Knapp Street allowing for a continuous bicycle path between 68th Street and Pennsylvania Avenue. These routes also allow for a direct connection to Ocean Parkway leading to either Coney Island Beach to the south or Prospect Park to the north.

Future and Ongoing Projects: The NYCDCP is developing a plan to improve the connection of the Shore Parkway Greenway between Bay Parkway and Knapp Street.

2. Greenways

- **Shore Parkway Path:** 12.7 miles

Currently, the Shore Parkway Greenway has two existing greenway segments that are separated by a large gap. The Shore Parkway signed, on-street routes (mentioned in the previous section) connect the two existing segments of the Shore Parkway Greenway with small signs. The NYC DCP is currently working on a project to enhance this connection (see Figure VIII-2, Schematic Greenway Plan).

— 68th Street – Bay Parkway
The first segment of the greenway extends from 68th Street (near Owl's Head Park) to Bay Parkway. Part of this segment, from Bay Ridge Avenue to the Verrazano Bridge, is a dual carriageway where bicyclists ride on a path that is separate from, but parallel to, the pedestrian path. Numerous entrances to the Shore Parkway Greenway cross the parkway from different neighborhoods. The first segment of the greenway continues south of the Verrazano-Narrows Bridge and ends at Bay Parkway and Bensonhurst Park. This part of the greenway links to Dyker Beach Park and golf course and to Bensonhurst Park.

Future and Ongoing Projects: The NYCDPR is seeking funding to repair deteriorating bulkhead under this section of the greenway.

— Knapp Street – Pennsylvania Avenue
The second segment of the greenway extends from Knapp Street in Sheepshead Bay to Pennsylvania Avenue and was reconstructed in 1999. The five and a half-mile trail travels through a number of wetland areas in the Gateway National Recreation Area. At Floyd Bennett Field, Greenway users can transfer from the Shore Parkway Greenway to the Rockaway Gateway Greenway to gain access to the Rockaways in Queens.

FIGURE VIII-2
SCHEMATIC GREENWAY PLAN

Future and Ongoing Projects: The remainder of the second segment of the Shore Parkway Greenway extends from Pennsylvania Avenue to 84th Street in Queens. Part of the greenway (Pennsylvania Avenue – Cross Bay Boulevard) has deteriorated and is under construction between 2001 and 2002. The reconstruction of this nearly six-mile mixed on- and off-street path crosses the Gateway National Recreation Area and is planned to connect to the network of on-street bicycle paths in Brooklyn. From Cross Bay Boulevard to JFKIA, a new multi-use bicycle and pedestrian path is in development to connect to JFKIA.

- **Ocean Parkway Bicycle and Pedestrian Corridor** (Church Avenue - Brighton Beach Avenue): 4.9 miles

  The greenway along Ocean Parkway is one part of the proposed Brooklyn-Queens Greenway, a 40-mile on- and off-street trail extending from Coney Island to Little Neck Bay. Ocean Parkway features a dual carriage bicycle path stretching from Church Street (near Prospect Park) to the Coney Island Boardwalk. The bicycle trail is located along the mall on the western side of the parkway and is lined with benches and trees. This trail is also accessible from the Shore Parkway Greenway that crosses Ocean Parkway several blocks north of Coney Island Beach.

  Future and Ongoing Projects: The Parks Department is in the middle of an ongoing rehabilitation project for the Ocean Parkway Corridor. This project includes, among other things, resurfacing work and the realignment of curb cuts to mitigate conflict between cyclists and the queuing cars. Phase I, between Beverly Avenue and Foster Avenue is complete. Phase II, between Shore Parkway and Brighton Avenue is slated for completion in 2003-2004. Additionally, in 2002, the NYC DOT installed following left turn signals and left turn bays at many intersections along the parkway to mitigate vehicle turning conflicts with pedestrians and cyclists.

- **Rockaway-Gateway Greenway: Flatbush Avenue** (Marine Park to Far Rockaway in Queens): 3 miles

  The existing portion of the a proposed Rockaway-Gateway Greenway follows Flatbush Avenue from Hendrickson Place to the Marine Parkway Bridge to Queens.

  Future and Ongoing Projects: The National Park Service plans to create a 20-mile loop around Jamaica Bay in Brooklyn and Queens.

- **Coney Island Boardwalk** (West 37th Street – Corbin Place): 2.5 miles

  The Coney Island Boardwalk has an existing greenway open to pedestrians at all times and open for bicycle use between 5 AM and 10 AM.

- **Leif Ericson Park Path** (66 - 67 Street, between 3 Avenue to Fort Hamilton Parkway): .25 miles.

  This short path is the only off-street portion of the *Sunset Park Connector Route*.

Future Projects: The NYCDPR is interested in continuing this greenway around the north edge of Owl's Head Park.

TABLE VIII-1
SOUTHERN BROOKLYN BICYCLE AND GREENWAY ROUTE MILES

Route		Miles
On Street-Class II and III	Shore Parkway Connector (Class III)	8.6
	Sunset Park Connector Class (Class II)*	5.0
	Bedford Avenue Bicycle Lane (Class II)*	6.3
	Total	*19.9*
Off Street – Class I	Coney Island Boardwalk (Class I)	2.5
	Ocean Parkway Malls Path (Class I)	4.9
	Shore Parkway Path (Class I)	12.7
	Rockaway – Gateway Greenway: Flatbush (Class I)	3.0
	Leif Ericson Park Path (Class I)	0.25
	Total	*23.35*
Total Bicycle Facility Miles in Study Area:		**43.25**

* *part of route is outside study area boundary.*

B. SUMMARY OF EXISTING AND PROPOSED PEDESTRIAN AND BICYCLE NETWORKS

1. Existing Bicycle Routes

Development of the greenway and bicycle lane network in Southern Brooklyn has focused on reconstructing deteriorated sections, closing gaps between existing greenway segments, expanding the current greenway routes, and establishing an on-street network. The TIS study area is served by approximately 23.4 miles of off street bike routes (Class I) linking many of the area's major recreational facilities (see Table VIII-1). An additional 19.9 miles of on street bike routes (Class II and III) link sections of greenway and provide an extended north-south route through Brooklyn.

Southern Brooklyn's most popular greenways are also some of the oldest in the city. In fact, Ocean Parkway was the country's first greenway, built in 1895. The Shore Parkway Path, part of Robert Moses' legacy, was built in 1941. Having fallen into disrepair, major reconstruction projects for both greenways began in the late eighties and early nineties. Rehabilitation and extension of the existing greenway system in Southern Brooklyn will continue for the next several years.

2. Pedestrian Network

In addition to the rehabilitation of Southern Brooklyn's multiuse greenways, efforts to improve the pedestrian network have focused on improving safety and access adjacent to transit nodes and along retail corridors.

The area's older neighborhoods and commercial area's, except where elevated highways serve as barriers, are very walkable. Through traffic, especially trucks, and speeding are

persistent concerns for some older neighborhoods. In recent years, suburban style drive-throughs, "big box," and strip developments with deep building setbacks have created a number of corridors that discourage walking and divide neighborhoods. Additionally, Southern Brooklyn's elevated rail lines present a particular set of challenges to pedestrians by blocking sight lines at intersections and darkening the sidewalks.

3. Proposed Routes

Additions to the greenway network in Southern Brooklyn have been proposed to take advantage of a number of opportunities unique to Southern Brooklyn's infrastructure and topography. Both *A Greenway Plan for New York City* and the *New York City Bicycle Master Plan* propose a Cross Brooklyn Greenway that would follow existing railroad tracks and extend from Broadway Junction to the Shore Parkway Greenway. Abandoned rail corridors present a feasible opportunity for trail use. This potential greenway would provide an excellent east-west connection across Brooklyn and could provide a possible loop for the Shore Parkway Greenway. Waterfront parkland along inlets from Jamaica Bay are possible opportunities to link the Shore Parkway path to the adjacent neighborhoods in the eastern portion of the study area.

4. Gaps and Barriers

A number of gaps and barriers have been identified in the bicycle and pedestrian network in Southern Brooklyn:

- **Insufficient or unsafe access to greenway from street network and surrounding communities.** Access points from Rockaway Parkway, Flatbush Avenue, and Bay Parkway are direct and popular, but difficult and unpleasant to ride on. In addition, collision data indicates that Flatbush Avenue and Bay Parkway are accident prone locations. Neighborhood pedestrian access to the greenway is particularly difficult because of the distances between access points.
- **No cross-town bicycle routes.** Except for the signed on-street Shore Parkway connector on the south, there are no east-west bicycle routes.
- **No bicycle routes in the northeastern section of the study area.** Recommended on-street routes from the *NYC Cycling Map*, represent significant opportunities to create Class II bike lanes for this area.
- **Unsafe crossings and inhospitable walking environment of arterials.** Some major arterials, such as Coney Island Avenue, function as pedestrian "moats."
- **Gaps and barriers in sidewalk network.** Although nearly all streets in Brooklyn have sidewalks, gaps and barriers were identified in the system where the sidewalks were missing or obstructed. Sidewalks adjacent to abandoned residential or industrial property are often reported missing or broken, while illegal and legal curb cuts are an issue in more developed residential neighborhoods. Common obstructions reported are vendors, sidewalk cafes, and parked or abandoned cars, with sidewalks near police precincts noted by residents of East Flatbush as being blocked by either Police Department personal vehicles, or crime scene or other stored vehicles.

Surrounding land use generators such as major employment centers, retail, cultural or educational centers, hospitals, parks, and beaches will also factor into the identification of potential routes within Southern Brooklyn. Potential routes need to provide connections between the above-noted destinations and the communities that they serve. These proposed additions to the greenway and bike route systems will complement and connect with on-street bicycle routes and the city's streets and sidewalks.

C. EXISTING AND FUTURE TRENDS IN BICYCLING AND WALKING

This section discusses key characteristics of non-motorized transportation in Southern Brooklyn. State accident data, census figures, land use information, information gathered at public meetings, agency contacts, and discussions with the Brooklyn Committee of Transportation Alternatives were used to identify opportunities to improve connections and increase the rates of cycling and walking. New York State accident data as it relates to pedestrians and cyclists was analyzed and reveals accident "hot spots" for Southern Brooklyn. Next, demographics potentially amenable to non-motorized commuting in Southern Brooklyn were identified. Additionally, spot counts were conducted to establish a sketch of bicycle and pedestrian activity at locations across Southern Brooklyn. Finally, a catalog of the availability of pedestrian and bicycle amenities, as well as existing and potential areas of activity was made. This includes access to transit, land uses amenable to non-motorized transportation, and major trip generators with potential bicycle and pedestrian elements.

1. Safety

According to NYS DOT accident data, 515 pedestrians and 153 bicyclists were struck and injured during the three-year period of 1997-1999. While these numbers represent only 10 percent of all reportable collisions during this period, pedestrians and cyclists make up 41 percent of fatal collisions in Southern Brooklyn.

a. Pedestrian Safety

Pedestrian accidents occurred most frequently along Flatbush Avenue, Nostrand Avenue, Church Avenue, Flatlands Avenue, Bay Parkway, and Linden Blvd. Not surprisingly, the intersection of two of these high pedestrian locations, Flatbush Avenue and Church Avenue, tops the list of the most accident prone intersections for pedestrians (see Table VIII-2). In addition to these corridors and intersections, locations with a high rate of pedestrian injury relative to motor vehicle injury should be given special attention. One such location is 4th Avenue and 86th St., where 48 percent of the injury accidents involved pedestrians (see Appendix F). Many locations in the top twenty pedestrian accident locations are associated with important transit nodes or retail corridors.

The accident data for pedestrians listed below is ranked by frequency only. Accident rate calculations were not possible because pedestrian volume data was not available for any of these locations. However, it is assumed that accident rates based on frequency are, in general, comparable to those calculated using volumes. Unfortunately, accident frequency for pedestrians only tells us part of the problem; that data cannot account for trips and routes not taken due to safety concerns. Some areas may be threatening enough to act as barriers.

TABLE VIII-2
TOP 20 PEDESTRIAN ACCIDENT LOCATIONS BY FREQUENCY*

	Location Description	Injury Accidents	PDO* Accidents	Bicyclist Accidents	Pedestrian Accidents
1	Flatbush Ave. and Church Ave.	76	5	4	22
2	Utica Ave. and Church Ave.	45	6	2	18
3	Ave. U and Flatbush Ave.	91	20	4	18
4	Church Ave. and Ocean Ave.	36	1	2	16
5	Flatlands Ave. and Paerdegat Ave. S	71	9	2	15
6	Flatlands Ave. and Rockaway Pkwy	42	4	2	14
7	Flatlands Ave. and E. 80th St	35	3	1	13
8	Bay Pkwy and 86th St	36	1	0	13
9	4th Ave. and 86th St	25	1	0	12
10	Nostrand Ave. and Church Ave.	34	3	1	12
11	Nostrand Ave. and Flatbush Ave.	41	2	4	12
12	Bay Pkwy and 65th St	48	11	1	12
13	Nostrand Ave. and Kings Hwy	58	5	3	12
14	Mc Donald Ave. and Church Ave.	28	11	0	11
15	Ocean Ave. and Kings Hwy	34	2	2	11
16	Emmons Ave. and Coney Island Ave.	50	5	1	11
17	Coney Island Ave. and Kings Hwy	28	3	2	10
18	8th Ave. and 65th St	30	3	1	10
19	Glenwood Rd. and E. 29th St.	40	2	3	10
20	Flatbush Ave. and Caton Ave.	42	4	0	9

* *of top 120 all-mode accident locations. NYS DOT 1997-1999*

b. Bicyclist Safety

Five of the top 10 most accident prone locations for bicyclists were on major streets that feed the Shore Parkway Greenway (see Table VIII-3). One of the top ten bicycle accident locations, the intersection of Caton Avenue and Bedford Avenue, is associated with a bicycle lane. Linden Boulevard, the major east-west route in the study area, and Flatbush Avenue are the main accident prone corridors for cyclists.

TABLE VIII-3
TOP 10 BICYCLE ACCIDENT LOCATIONS BY FREQUENCY*

Location Description	Injury Accidents	PDO* Accidents	Pedestrian Accidents	Bicyclist Accidents
Linden Blvd. and Van Siclen Ave.	60	3	6	5
Cropsey Ave. and Bay Pkwy.	42	6	4	5
Linden Blvd. and Rockaway Ave.	79	12	2	5
Nostrand Ave. and Flatbush Ave.	41	2	12	4
Flatbush Ave. and Church Ave.	76	5	22	4
Linden Blvd. and Rogers Ave.	39	2	8	4
Avenue U and Flatbush Ave.	91	20	18	4
Caton Ave. and Bedford Ave.	38	5	5	4
Glenwood Rd. and E. 29th St.	40	2	10	3
Nostrand Ave. and Kings Hwy.	58	5	12	3

* *of top 120 all-mode accident locations. NYSDOT 1997-1999.*

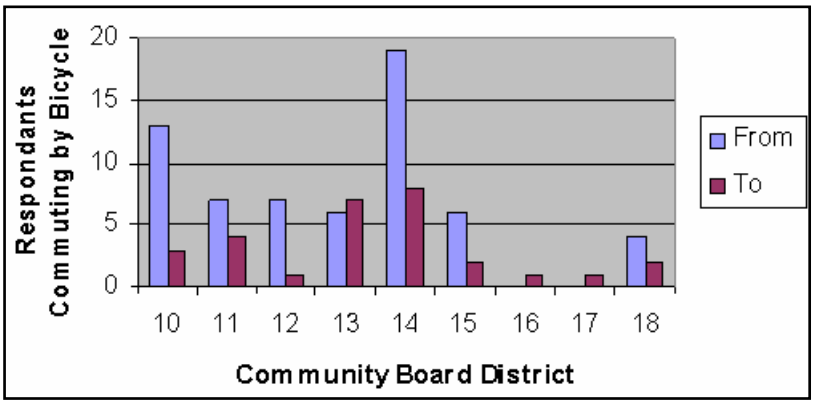
2. Current and Future Use Estimates

Demographic data from several sources was used to determine current and future use estimates for bicycling and walking in Southern Brooklyn. Journey to Work data, as well as well as basic population figures from the 1990 and 2000 US Census were analyzed. In addition, NYC DCP's *Draft Bicycle Survey Report* provided information on commuting habits and characteristics of cyclists in New York City who belong to an organized club or group. It should be noted that both data sources have their drawbacks. The work trip captured by the census only describes roughly 17 percent of the total trips. This leaves a significant portion of trips unaccounted for. Census data also only captures the principal mode choice for one day in the spring. Commuters who combined modes were asked to discuss the mode that covered the most distance. This means that those people who walked or rode bicycles to transit probably did not have the bicycle or pedestrian element of the trip captured. Additionally, because the actual numbers captured by the census for those who commuted by bicycle are so small, analysis at the census tract level is not necessarily accurate. The utility of the second data source, NYC DCP's *Draft Bicycle Survey Report*, is limited in that the questionaire was primarily distributed to members of bicycle organizations. It is thought that club members tend to share other socicoeconomic characteristics and may not be generally representative of the universe of people who ride bicycles in New York City. However, understanding these limitations, the data does present a rough idea of bicycle activity in Southern Brooklyn

According to US census figures, the number of people traveling to work in Southern Brooklyn primarily by bicycle nearly doubled between the 1990 Census and the 2000 Census (see Appendix F). The actual number of people reporting to commute exclusively by bicycle is still small in comparison to those using transit or other modes. However, the 82 percent increase in cycling in Southern Brooklyn reflects a citywide trend which was most remarkable in Brooklyn, where cycling increased by 117 percent during the same period. The number of people walking to work also increased, rising by 7.14 percent. In raw numbers, the 2000 US Census figures for the study area report that 1,726 people travel to work primarily by bicycle and 33,941 people travel primarily on foot.

Commuters in Southern Brooklyn have less than average rates of walking and bicycling to work. While 11 percent of New Yorkers walk to work, only 7 percent of commuters in the study area do so. In part, this is likely due to the distance of Southern Brooklyn's residential neighborhoods from the city's major employment centers of Downtown Brooklyn, Lower Manhattan and Midtown Manhattan. Conversely, the percent of people who walk to work is higher in the more self-contained communities of the US Army Garrison at Fort Hamilton and Orthodox Jewish Borough Park. These areas report a rate of walking to work as high as 30-40 percent because many residents live and work in the same community. Interestingly, the figures show that rates of bicycling are also higher in these communities. According to the NYC DCP's Draft Bicycle Survey Report, the greatest number of survey respondents in Southern Brooklyn claimed Community Board 14 as the starting point of their commute. Community Board 14 also had the most cyclists reporting the area as their destination also. The next most-reported bicycle commute origin was Community Board 10. (See Figure VIII-3.)

FIGURE VIII-3
BICYCLE SURVEY REPORT RESPONDENTS BY SOUTHERN BROOKLYN COMMUNITY BOARD DISTRICT



3. Summary of Spot Counts

Pedestrian and bicycle spot counts were conducted in the late summer of 2002 to establish a sketch comparative understanding of non-motorized activity at key locations throughout the study area

a. Count Locations

A total of 20 locations were counted, as shown in Table VIII-4. The selected pedestrian locations represent the highest use areas for pedestrians and areas slated for large scale development in Southern Brooklyn. These include transit hubs, retail corridors, and future development sites. These locations were correlated with pedestrian accident data and places identified in public meetings. Locations for bicycle counts represent existing bicycle corridors, intersections with a high number of bicycle accidents; access points to recreational facilities, and previously identified gaps between existing facilities.

b. Pedestrian Counts

With a total of 6,000 pedestrians over the two hour evening rush, the intersection of Flatbush Avenue and Nostrand Avenue had the highest pedestrian volumes of all the areas counted. The second highest volumes were posted at Flatbush Avenue and Church Avenue. The intersection of 65th Street and 8th Avenue had the lowest volumes in the sample, with 589 pedestrians counted over the two hour rush.

Flatbush Avenue and Nostrand Avenue, and the intersection of Bay Parkway and 86th Street were nearly tied for the highest lunchtime volumes. Respectively, the volumes were 3,991 and 4,002 pedestrians counted during the two hour lunch peak. The lowest volumes in the survey during this time was at 65th Street and 8th Avenue, which only drew 339 pedestrians in the same two hour period. Appendix F presents a complete summary of pedestrian counts.

TABLE VIII-4
COUNT LOCATIONS

Pedestrian Count Locations	
1	86th St. & 4th Ave.
2	Church Ave. & McDonald Ave.
3	Flatbush Ave. and Church Ave.
4	65th St. & 8th Ave.
5	Nostrand Ave. & Kings Highway
6	Utica Ave. & Church Ave.
7	Flatlands Ave. & Rockaway Pkwy.
8	Bay Parkway & 86th St.
9	Bay Parkway & 65th St.
10	Flatbush Ave. & Nostrand Ave.
11	Flatbush Ave. and Avenue U
Bicycle Count Locations	
12	Rockaway Pkwy & Avenue N
13	Coney Island Ave & Neptune Ave (Shore Parkway Connector)
14	Bay Parkway & Cropsy Ave
15	Sunset Park Connector (Leif Ericson Park)
16	Shore Parkway at Knapp St.
17	Shore Parkway Path at Flatbush Ave
18	Bedford Ave. and Linden Blvd.
19	Ocean Parkway at Beverly Road
20	Linden Blvd. & Van Siclen Ave.

c. Bicycle Counts

The highest volumes of cyclists were recorded at the intersection of the Shore Parkway Path and Flatbush Avenue with 155 bicyclists counted in the two hour midday weekend count period. The lowest was at the Sunset Park Connector of Leif Ericson Park where only one cyclist was sighted during the same period. This section of greenway was only recently connected as part of the Shore Parkway bicycle path and it may not be known to very many cyclists. The busiest weekday PM peak counts were taken at Ocean Parkway and Beverly Road. Interestingly, there were nearly as many cyclists recorded traveling east-west on Linden Boulevard and Van Siclen Avenue as were counted traveling north and south on Bedford Avenue at Linden Boulevard, which has a bicycle path. For a more detailed summary, see Appendix F.

4. Major Trip Generators with Existing or Potential Bicycle Elements

a. Employment Centers

According to the National Personal Transportation Survey (NPTS), the majority of pedestrian trips are 0.4 km (0.25 mi) or less, with 1.6 km (1 mi) generally being the limit that most people are willing to travel on foot. In other words, most people are willing to take a five to ten minute walk at a comfortable pace to reach a destination. The NPTS also reports that the majority of bicycle trips nationally are 4.8 km (3 mi) or less, but the

NYC DCP's Draft Bicycle Survey Report suggests that the average commuting distance in New York City is between 5-7 miles. For much of Southern Brooklyn, the major employment centers of Downtown Brooklyn, Lower Manhattan and Midtown Manhattan lie outside of these non-motorized "comfort zones." However, about half of Southern Brooklyn's labor force works in Brooklyn. Those that do work in Southern Brooklyn are likely to be employed in a small business—91 percent of the companies in Brooklyn have fewer than 20 employees. Larger employers in the Borough, including hospitals and large retailers, and the bicycle amenities that serve them are listed in Appendix F. Also included in this Appendix table are the two colleges in the study area, which are particularly important centers of bicycle commuting. Each type of employer has its own set of barriers and opportunities to encourage bicycle commuting. Large employers may have more resources to provide secure bicycle parking, but more rigid rules governing their physical plant. Smaller companies may have fewer resources, but more flexibility. "Bicycle Parking Solutions," produced by NYMTC is a resource to help companies address these issues.

b. Recreational Destinations

To one degree or another, most activities in Brooklyn are accessible by bicycling or walking. However, recreational land uses are particularly suited to the advantages of walking and the range of cycling. Such locations include parks, recreational centers, beaches, pools, schools and libraries. Indeed, recreational cyclists make up the largest category of cyclists. The rehabilitation of Southern Brooklyn's Shore Parkway Path has revived one of area's greatest recreational assets. The improved recreational environment for cycling in Southern Brooklyn has not only contributed to the quality of life in Southern Brooklyn, but has also increased awareness of cycling as a viable means of transportation. However, further improvements are needed to strengthen this connection. Appendix F includes a listing of the locations of the major activity centers in Southern Brooklyn that are especially attractive to bicyclists and pedestrians. It also documents the bicycle facilities that are available near these locations.

c. Retail Corridors

Previous planning efforts in Southern Brooklyn have identified the need for improved pedestrian safety and convenience at popular retail corridors that attract a high volume of pedestrians. Retail corridors and centers can also attract and serve cyclists by providing well-situated, short-term parking. In order for bicycle parking to be useful, the bike rack must be placed in a highly visible location, very close to the destination, and without causing inconvenience to pedestrians. For short-term parking, it is better to have smaller bike racks scattered throughout a corridor or area than to have a large centralized location. The NYC DOT's Cityracks program is designed to provide for just this sort of parking with their modified "inverted U" racks. The DOT installs their racks free in front of businesses that request them, provided the location meets their criteria. See Appendix F for a list of bike rack locations in Southern Brooklyn.

5. Nodes

If walking or cycling to the subway or bus stop feels unsafe or unpleasant, people are more likely to choose to drive to the station or bypass transit altogether. This is especially the case in Southern Brooklyn, which is well served by transit, but has a rate of car ownership higher than the citywide average. Improving the link between non-motorized modes and transit in Southern Brooklyn is the one of the most effective ways to use pedestrian and bicycle mobility to relieve pressure on the local roadway system.

People in Southern Brooklyn take the bus to the train *much more*, drive to the train a *little more* and walk to the train *much less* than people in other parts of Brooklyn. Still, the axiom "Every transit trip begins and ends with pedestrian travel," is just as true in Southern Brooklyn as anywhere. Table VIII-5 shows mode of access for a sample of stations in the study area, as reported in NYC DCP's *Subway Sidewalk Tech Memo III.* There was no data available on rates of cycling to transit in the study area.

TABLE VIII-5
MODE OF ACCESS TO SAMPLE SUBWAY STATIONS

	% Walk Rank out of 160 Brooklyn stations	Bus	Drive	Other
Kings	65% 152	24%	9%	2%
Sheepshead Bay	62% 153	20%	16%	2%
Church Ave.	68% 150	14%	18%	0%

6. Pedestrian Access to Transit

Efforts to improve the safety, comfort and convenience of pedestrian routes to rapid transit stations and bus stops promise to improve mode shares for both walking and transit.

Pedestrian safety is a major issue around transit stations in the study area. Not surprisingly, the busiest station for each of the area's seven lines are located within less than ¼ mile of an intersection in the top twenty worst intersections for pedestrians ranked by frequency (see Table VIII-6). Congestion and clutter along sidewalks hinders pedestrian mobility and comfort adjacent to transit stations. An example of this occurs at the Brighton Beach stations of the Q train where there is insufficient sidewalk space to handle large volumes of pedestrian and competing commercial uses. As a result, pedestrians often spill out into the street, especially at intersections.

TABLE VIII-6
PEDESTRIAN ACCIDENTS NEAR SUBWAY STATIONS IN SOUTHERN BROOKLYN
(OUT OF TOP 120 ALL-MODE CRASH LOCATIONS FOR 1997-1999.)
NYSDOT CLASS DATA

Pedestrian Accidents	Intersection		Subway	Bus	2000 Ridership	
22	Flatbush Ave.	Church Ave.	Q, W	41, 35	4,930,357	Busiest in study area
16	Ocean Ave.	Church Ave.	Q,W	35	4,930,357	Busiest in study area
14	Flatlands Ave.	Rockaway Pkwy.	L	42, 6, 60, 82, 103	2,873,821	Busiest on line
13	Bay Parkway	86th St.	M, W	1, 6, 82	N/A	
12	Nostrand Ave.	Church Ave.	2,5	35, 44	2,999,614	2nd busiest on line
12	4th Ave.	86th St	R	16, 64, B79, s93, s53, s79	2,435,039	Busiest on line
12	Bay Parkway	65th St.	N	6	1,156,255	Busiest on line
12	Flatbush Ave.	Nostrand Ave.	2,5	Q 35, 103, 41, 6, 11, 44	5,499,297	Busiest on line
11	16th St.	Kings Hwy.	Q,	7, 82, 100, x29	4,891,156	
11	McDonald Ave.	Church Ave.	F	67, 35	2,435,039	Busiest on line
10	Nostrand Ave.	Glenwood Ave.	2,5	Q 35, 103, 41, 6, 11, 44	5,499,297	Busiest on line
10	8th Ave.	65th St	N	70	1,146,251	2nd busiest on line
9	Flatbush Ave.	Caton Ave.	Q, W	41	4,930,357	Busiest in study area

Because pedestrians have a high degree of exposure to and intimacy with the street environment, they are not only sensitive to the safety of their route, but also aesthetics and convenience. Other issues for pedestrians at Southern Brooklyn subway stations include poor sidewalk lighting and lack of wayfinding signs. The presence of ADA pedestrian ramps at each crossing not only helps people with disabilities, but also helps smooth the trip for other pedestrians. Street trees, vibrant commercial street life, and pedestrian amenities such as benches all help make walking to transit a more attractive option.

7. Bicycle Access to Transit

While distances from Southern Brooklyn may be too far from the central business district for the average cyclist, bicycling can be an important way for some commuters to speed their trip to the train. This is especially true when the nearest subway station is too far to walk, as is the case for many in Southern Brooklyn. However, the major concern regarding access to transit for cyclists is parking. Bicycles left unattended for long periods of time at subway stations are particularly vulnerable to theft and vandalism. Secure bicycle parking at transit can take many forms from a simple inverted U rack monitored by security apparatus to bicycle lockers with monthly passes. Discussions with local bicycle groups highlighted this demand and suggested potential stations where demand might be highest. Major stations of interest include the Flatbush Avenue/Brooklyn College station of the Nos. 2 and 5 Lines, Crown Heights/Utica Avenue station on the Nos. 1 and 3 Lines, Canarsie/Rockaway Parkway on the L Line, and the Kings Highway and Newkirk stations on the Q Line.