

Introduction

The New York City Department of City Planning's (NYCDCP) Transportation Division, in association with the Staten Island Borough Office, is undertaking the Charleston Transportation Study. This study analyzes potential future land use development scenarios in order to provide a comprehensive analysis of existing and potential future vehicular, parking, public transit, and pedestrian circulation patterns within the study area. Additionally, it develops recommendations to address the existing and future (projected) conditions within the study area.

The study area is located in the southern part of Staten Island, as indicated in Figure 1. To the east it is bounded by Bloomingdale Road. To the south it is bounded by the Staten Island Railway and Arthur Kill Road, and to the north and west, it is bounded by the Arthur Kill waterfront (Figure 2). This area is very isolated with approximately half of it covered with vacant land, which may offer possibilities for future development.

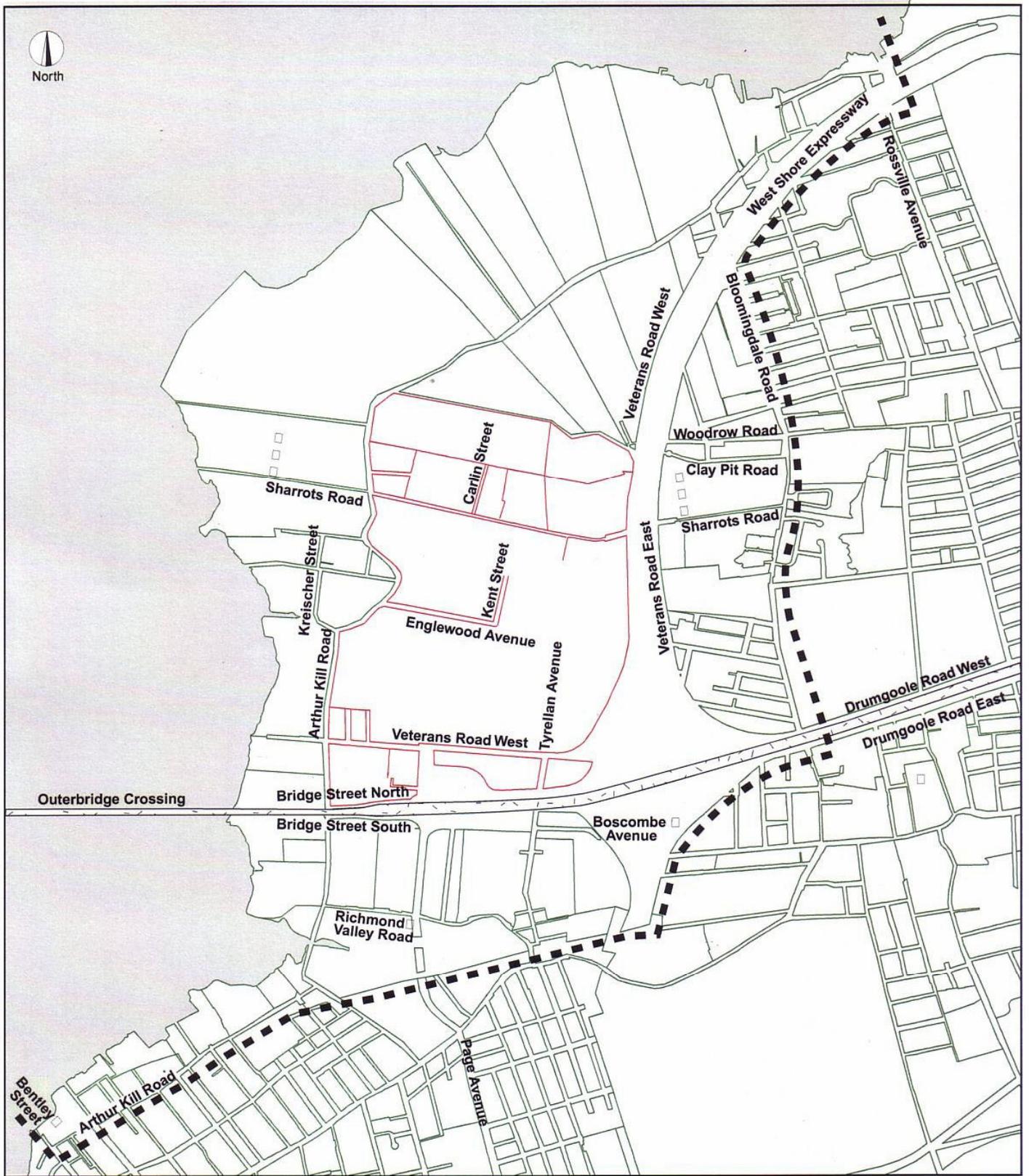
Goals

The Charleston Transportation Study goals are:

- Examine existing vehicular, parking, transit and pedestrian conditions.
- Examine proposed and potential future land use scenarios and analyze potential future vehicular, parking, transit and pedestrian circulation patterns.
- Develop recommendations to maximize:
 - The transportation system's level of service;
 - Vehicular and pedestrian safety; and
 - Congestion mitigation.
- Develop recommendations to minimize conflicts between designated truck routes and existing and proposed residential uses.

Objectives

- Analyze and evaluate the existing conditions, as well as conduct qualitative and quantitative analyses of the study area's traffic level of service (LOS), parking demand, transit use, and pedestrian circulation.
- Analyze and evaluate the future (projected) conditions within the study area. This evaluation includes a detailed inventory of plausible land uses, development potential, and infrastructure adjustments, and an examination of demographic trends. Additionally, perform qualitative analysis of the future conditions, such as traffic generation, parking demand, transit use, and pedestrian circulation.
- Develop and evaluate recommendations and improvements to address issues associated with existing and projected traffic, parking, transit and pedestrian conditions.



Study Area Boundary

■ ■ ■ Study Area Boundary

Existing Conditions

Study Area Historical Background

Early History to 1930's

The Charleston study area was originally populated by Native Americans. In the late 1600's the area was named Androvetteville after the French Huguenot family, the Androvettes, who inhabited the area. Farming, fishing, oystering and shipbuilding were their primary commercial activities. In 1853 Balthasar Kreisler, a Bavarian immigrant, established a brick factory in the area due to the large deposits of clay found nearby. The mining of this clay created many of the small ponds in Clay Pit Ponds State Park Preserve located just north of the area. Kreisler's brick works expanded and in 1858 the area was renamed Kreislerville. Kreislerville was a small factory town with houses within walking distance of the brick factory. Balthasar Kreisler built his estate, Fairview, on what was called Kreisler Hill overlooking the factory. He also built two stick style Victorian homes for each of his sons, Edward and Charles. Charles's home, which is just west of the site, still remains and is now owned by the Parks Department. It is a NYC Landmark and is also on the National Register of Historic Places. Fairview, along with the brick factory, burned down in the 1930's. The area name was changed from Kreislerville to Charleston during World War II due to animosity towards Germany.

Post World War II

From the 1930's through the present Charleston has retained its rural character. In 1961 the underlying zoning was established. Charleston was identified as a future manufacturing district and was given M1, M2 and M3 designations. The West Shore Expressway, created in 1964, isolated Charleston from the rest of Staten Island. The housing built before the mapping of the districts remained, but new housing was not allowed in the M districts.

In 1975 the South Richmond Special Development District (SRSD) was mapped as an overlay on virtually all of Community Board 3, including Charleston. The SRSD was amended to designate an area located in Charleston, Special Area M, to allowed for R3X development. A small R3X district was created in the 1990's to legalize the core of the Charleston residential community.

In 1976 the state established a preserve, Clay Pit Ponds State Park Preserve in Charleston. The 260 acre preserve is operated by the State of New York Office of Parks, Recreation and Historic Preservation. This park is home to many species of fauna and flora, some rare and endangered. In the 1980's NYCDEC mapped many wetlands in the Charleston area. New York City still owns large tracts of vacant land in the area.

Current uses along the main artery of Charleston, Arthur Kill Road, now are comprised of small, medium, and large retail and commercial developments including a prison, shipyards, a golf driving range, a waste transfer station, the Port Mobil tank farm, two gun clubs, bars, restaurants, adult saloons, and the never used mammoth liquid natural gas tanks.

Zoning

There are three basic zoning designations within New York City: residential (R), commercial (C), and manufacturing (M). These designations are further broken down by density. There are ten residential, eight commercial, and three manufacturing zoning districts of varying densities. Manufacturing zoning districts are further classified into performance zones.

Residential zoning districts range from R1 (the lowest density) to R10 (the highest density). R1 zoning districts are typically characterized by single-family detached homes, while R10 zoning districts are generally characterized by high-rise elevator buildings. Commercial zoning districts range from C1 to C8, with each zoning district designed to serve a specific purpose. Uses permitted in commercial zoning districts range from local retail and service establishments (C1 and C2) to retail and office uses in a central business district (C5 and C6) to heavy automotive-related services (C8). Finally, manufacturing zoning districts range from M1 (high performance zone) to M3 (low performance zone). High performance zones accommodate light manufacturing uses which are the least harmful industrial uses, and often provide buffers between manufacturing zoning districts, and residential or commercial zoning districts. In contrast, low performance zones include heavy manufacturing uses which are typically the most noxious industrial uses.

The zoning designation determines which uses are allowed in each zoning district. These uses are categorized into eighteen Use Groups by their common functional or nuisance characteristics. Use Groups 1-4 include residential and community facility uses, which are considered the least burdensome uses on the nuisance scale. Use Groups 5-16 consist of commercial uses, however these are further broken down into local retail and commercial uses (Use Groups 5-11), waterfront and recreational uses (Use Groups 12-15), and general service uses such as automotive-related services (Use Group 16). Finally, Use Groups 17 and 18 are comprised of manufacturing uses, which are considered the most burdensome uses on the nuisance scale.

Figure 3 presents the existing zoning mapped within the study area boundaries. A substantial portion of the study area, between the West Shore Expressway and the waterfront is zoned for manufacturing uses. Each zoning district, located within the Charleston study area is described below.

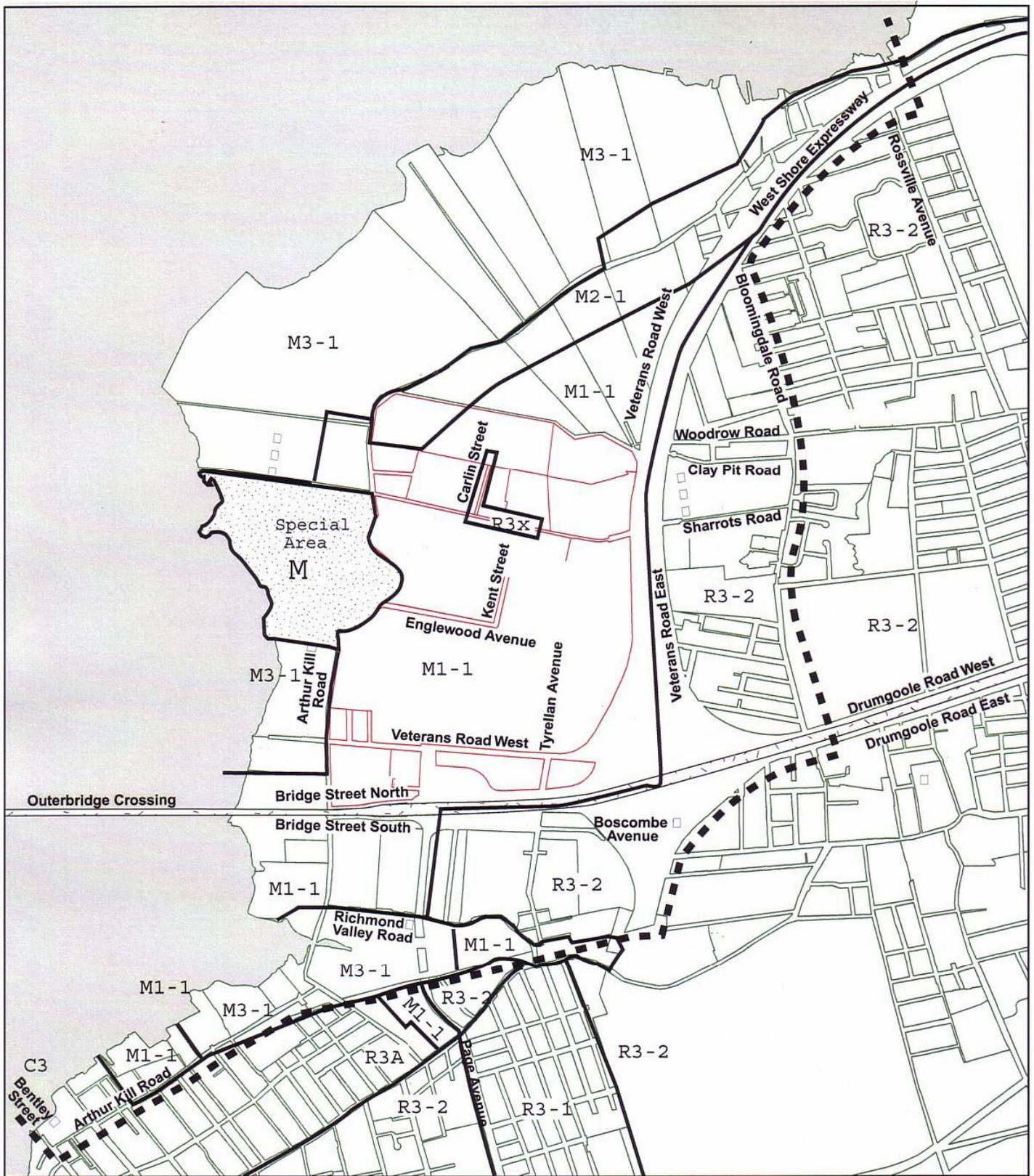
Residential Zoning Districts

There are two residential zoning districts located within the Charleston study area consisting of two R3-2 zoning districts and one R3X zoning district. Both R3-2 zoning districts are located along the eastern boundary of the study area. The first is located between Richmond Parkway to the south, Bloomingdale Road to the east and the West Shore Expressway to the west, while the second is generally bounded by Richmond Parkway to the north, Richmond Valley Road to the south, the West Shore Expressway to the east, and Page Avenue to the west. The single R3X zoning district is located in the heart of the study area, surrounded on all sides by an M1- 1 zoning district. This zoning district is generally bounded by Nielsen Avenue to the north, Sharrotts Road to the south, Kent Street to the east, and Carlin Street to the west.

Table 1 delineates the residential zoning districts, and their corresponding floor area ratios (FAR), located within the Charleston study area.

**Table 1
Residential Zoning Districts Located Within the Study Area**

| Zoning District | Maximum Residential FAR | Maximum Commercial FAR | Maximum Manufacturing FAR | Maximum Community Facility FAR |
|-----------------|-------------------------|------------------------|---------------------------|--------------------------------|
| R3-2 | 0.60 | not allowed | not allowed | 1.00 |
| R3X | 0.60 | not allowed | not allowed | 1.00 |



Existing Zoning

- ■ ■ Study Area Boundary □
- Zoning Boundaries □
- Special Area

Commercial Zoning Districts

There is one commercial zoning district located within the Charleston study area. A small C3 zoning district is found in the southernmost portion of the study area along the waterfront between Johnson Avenue to the north, Bentley Street to the south, and Ellis Street to the east.

Table 2 delineates the commercial zoning district, and the corresponding FARs, located within the Charleston study area.

Table 2
Commercial Zoning Districts Located Within the Study Area

| Zoning District | Maximum Residential FAR | Maximum Commercial FAR | Maximum Manufacturing FAR | Maximum Community Facility FAR |
|-----------------|-------------------------|------------------------|---------------------------|--------------------------------|
| C3 | 0.50 | 0.50 | not allowed | 1.00 |

Manufacturing Zoning Districts

There are three manufacturing zoning districts, which is the predominant zoning designation within the Charleston study area. There are three M1-1, one M2-1, and three M3-1 zoning districts located within the area.

The largest industrial zone is the M1-1 zoning district located in the middle one-third of the study area. This district is generally bounded by Sharrotts Road and the former West Shore Expressway to the north, Richmond Valley Road and Richmond Parkway to the south, the West Shore Expressway and Page Avenue to the east, and the waterfront to the west. However, two smaller zoning districts, an M3-1 and an R3X, are located within these boundaries. The second M1-1 zoning district is located in the southeastern section of the study area between Richmond Valley Road and Winans Street to the north and the Staten Island Railway tracks to the south, while the final M1-1 zoning district is located on the waterfront between Tracy and Johnson avenues and Ellis Street.

The sole M2-1 zoning district is found in the northern portion of the study area and is bounded by Arthur Kill Road to the northwest, the former West Shore Expressway to the southeast, and Nielsen Avenue to the south. Additionally, three M3-1 zoning districts lie within the Charleston study area. The largest M3-1 zoning district is located in the northwestern section of the study area between Rossville Avenue, Arthur Kill and Sharrotts roads and the waterfront. The second M3-1 zoning district is also situated on the waterfront between Androvette Street to the north, the area immediately north of the Outerbridge Crossing to the south, and Arthur Kill Road to the east. The final M3-1 zoning district is found in the southern portion of the study area, generally bounded by Richmond Valley Road to the north, the Staten Island Railway tracks to the south, Tracy Avenue to the southwest, and the waterfront.

Table 3 delineates the manufacturing zoning districts, and their corresponding FARs, located within the Charleston study area.

Table 3
Manufacturing Zoning Districts Located Within the Study Area

| Zoning District | Maximum Residential FAR | Maximum Commercial FAR | Maximum Manufacturing FAR | Maximum Community Facility FAR |
|-----------------|-------------------------|------------------------|---------------------------|--------------------------------|
| M1-1 | not allowed | 1.00 | 1.00 | 2.40 |
| M2-1 | not allowed | 2.00 | 2.00 | not allowed |
| M3-1 | not allowed | 2.00 | 2.00 | not allowed |

Special Purpose Zoning Districts

The City Planning Commission established Special Purpose Zoning Districts, or Special Districts, to achieve specific planning and urban design objectives within a designated area. Each Special District has its own planning and urban design guidelines, providing zoning incentives to developers who comply with the specified guidelines within the designated area. Special Districts are a way of uniting public and private interests.

The entire Charleston study area is located within the Special South Richmond Development District. This Special District was established to “guide development of predominantly vacant land....to ensure that new development is compatible with existing communities” (NYC DCP Zoning Handbook, July 1990, p. 117) in this area of Staten Island. It was also designed to encourage the most desirable and balanced use of land as well as “avoid destruction of irreplaceable natural and recreational resources” (NYC Zoning Resolution, Section 107-00). The Special South Richmond Development District is identifiable by the label SRD on zoning maps.

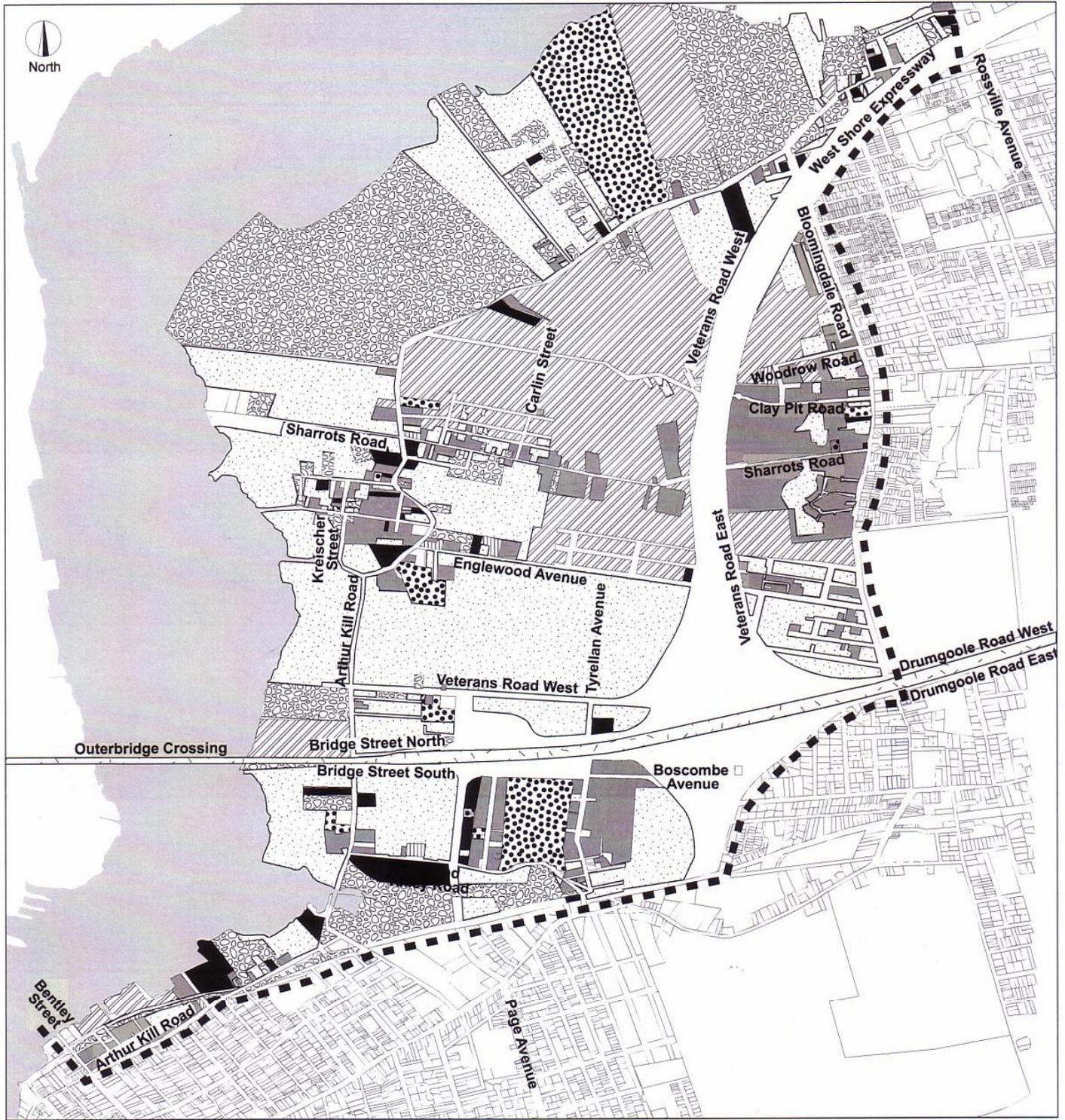
Land Use

Vacant land permeates the Charleston study area. Although the area is primarily zoned for manufacturing, vacant land comprises 39.5% of the total land use. Manufacturing uses, however, occupy a significant portion of the land, with a comparable amount of open space located within the study area, as indicated in Figure 4. Collectively, these three land uses constitute 78.5% of the total land within the study area. The remaining land consists of residential and institutional uses as well as commercial, transportation and utility, and parking facility uses. A fraction of the land is unclassified.

Residential Uses

Residential uses represent 9.2% of the total land within the study area. One- and two-family homes characterize the bulk, while a negligible amount of multi-family residences make-up the remaining residential uses.

Clusters of residential uses are found throughout the area. A section of land along the eastern boundary of the study area between Crabtree Avenue, Sonia Court, and West Shore Road primarily consists of one- and two-family homes. The same is true for a small area located on the southwest boundary between Weir Lane, Bentley Street, and Arthur Kill Road. Additionally, a compact area



Existing Land Use

- | | | | |
|---------|------------------------|---------|-------------------|
| ■ ■ ■ ■ | Study Area Boundary | ▨ ▨ ▨ ▨ | Open Space |
| ■ ■ ■ ■ | Commercial | ● ● ● ● | Public Facilities |
| ▨ ▨ ▨ ▨ | Commercial/Residential | ▨ ▨ ▨ ▨ | Residential |
| ▨ ▨ ▨ ▨ | Manufacturing | ▨ ▨ ▨ ▨ | Vacant Land |

along Arthur Kill Road between Ellis Road and Englewood Avenue, and a larger area located south of the West Shore Expressway between Page Avenue and Meade Place, are populated with one- and two-family residences.

Commercial Uses

Commercial uses comprise 2.9% of the total land within the study area, however an additional 0.4% is classified as mixed residential and commercial use. Commercial uses range from ice hockey to adult entertainment, from gun clubs to a marina.

Commercial uses are scattered throughout the study area with no distinct commercial core. However, two pockets of commercial uses are found in close proximity to the residential clusters. Commercial uses sparsely surround the one- and two-family homes in the compact area along Arthur Kill Road between Ellis Road and Englewood Avenue, while additional commercial uses are located to the west and southwest of the residential area located immediately south of the West Shore Expressway between Page Avenue and Meade Loop.

Manufacturing/Industrial Uses

Although the Charleston area is primarily industrially-zoned, industrial uses only make up 19.4% of the total land within the study area. Industrial uses range from an oil tank farm to a prison, from warehouses to waste transfer stations.

Manufacturing uses are found throughout the Charleston study area, with a large concentration of industrial land located on the waterfront. The area north of Ellis Road, south of Rossville Road, and west of Arthur Kill Road is predominantly industrial. Mobil Oil Corporation is the largest manufacturing use located within this area and consumes a significant amount of waterfront land. A broad area between Sharrotts Road and Englewood Road, west of Clay Pit Ponds State Park Preserve, contains numerous manufacturing uses. Additionally, various waterfront lots located south of West Shore Road accommodate industrial uses.

Transportation and Utility Uses

Transportation and utility uses occupy 1.5% of the total land within the study area. The principal transportation use is the Staten Island railroad and yards.

The transportation and utility uses are primarily located in the southern portion of the study area. The Staten Island railroad runs along the southern boundary, terminating at the Tottenville station in the southwest corner of the study area. The railroad yards are also located along the southern boundary, immediately south of Richmond Valley Road between Arthur Kill Road and Page Avenue. Other transportation and utility uses include a truck depot.

Public Facility and Institutional Uses

Public facilities and institutions comprise 6.9% of the total land within the study area. Public facility and institutional uses range from houses of worship to schools to correctional facilities. The Arthur Kill Correctional Facility is located in a predominantly industrial area in the northern portion of the study area, while a private elementary school is located in the southern portion of the Charleston area. Additionally, there are houses of worship of various denominations located within the study area.

Parking and Vehicle Storage Uses

Parking and vehicle storage facilities make up a negligible 0.3% of the total land within the study area.

Parks and Open Space

Parks and open space constitute 19.6% of the total land within the study area. Clay Pit Ponds State Park Preserve, which is located in the heart of the Charleston area, represents the majority of the study area's open space.

Vacant Land and Buildings

Vacant land and buildings represent 39.5% of land within the study area, making it the most predominant land use in the Charleston area.

Horse Industry

The horse industry is important to the Staten Island community and its residents. As the only borough in New York City without a public riding facility, the Staten Island Horse Association rallies the nine local stables and riding academies together to provide the countless number of horse owners and riders in Staten Island the opportunities usually afforded only to the rural communities of the state. During the course of the study, it came to our attention, that the horse industry has a need to use our streets in the same way as vehicles and pedestrians. It is our desire to minimize potential conflicts that may arise among these components. Figure 5 indicates all horse crossing intersections in the study area.

Socioeconomic Characteristics

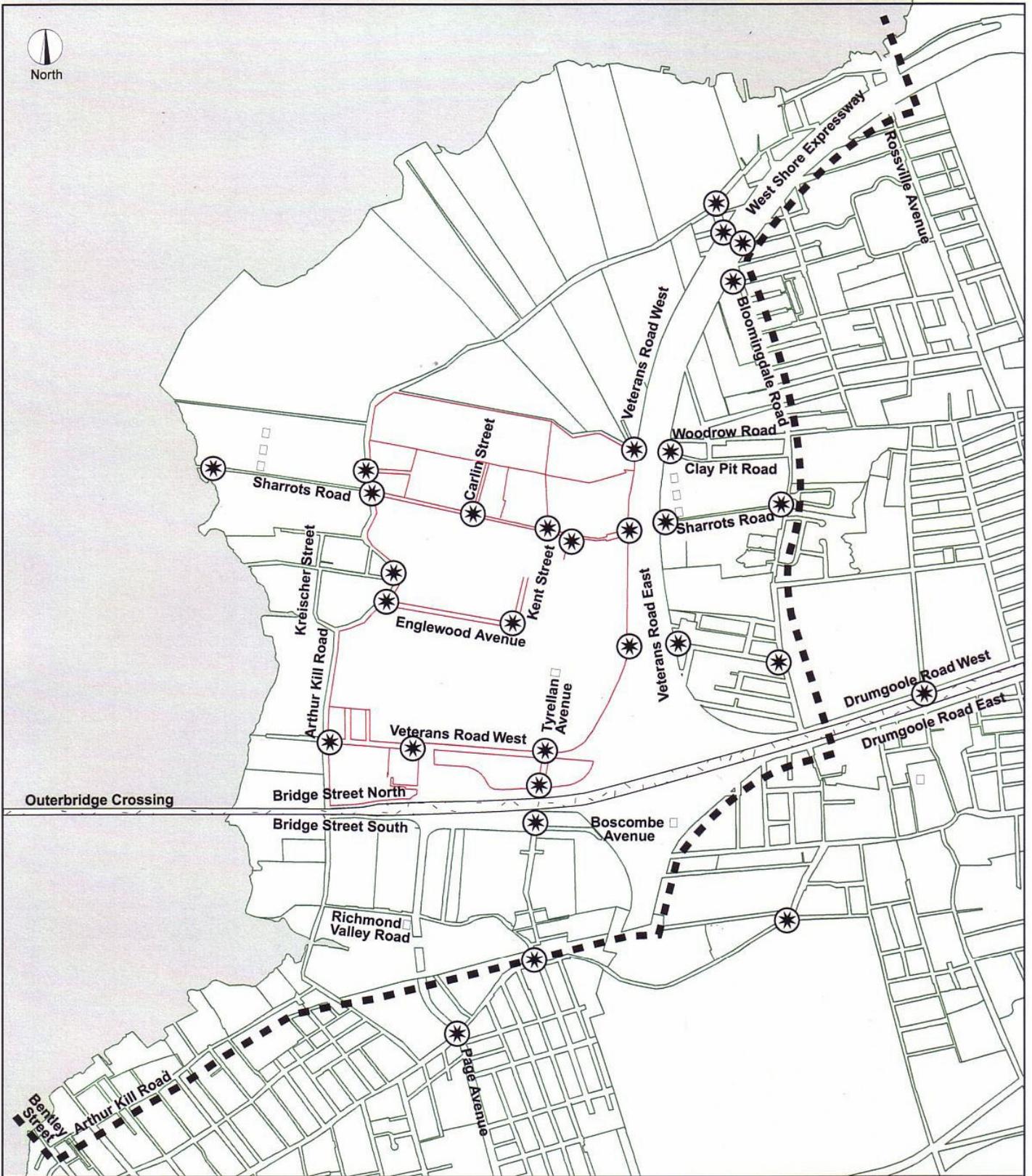
The Charleston study area encompasses portions of three census tracts (see Figure 6). Approximately 10% of land area of tract 208.01, 80% of tract 226, and 40% of tract 248 are located within the study area.

The following tables show the total population in the year 2000 for the selected census tracts and the change in population between the years 1990 and 2000 for the selected census tracts. Table 4 shows the estimated total population, and the change in estimated total population, between 1990 and 2000, for the study area.

Table 4
Census Tracts Population and Change in Population Between 1990 & 2000

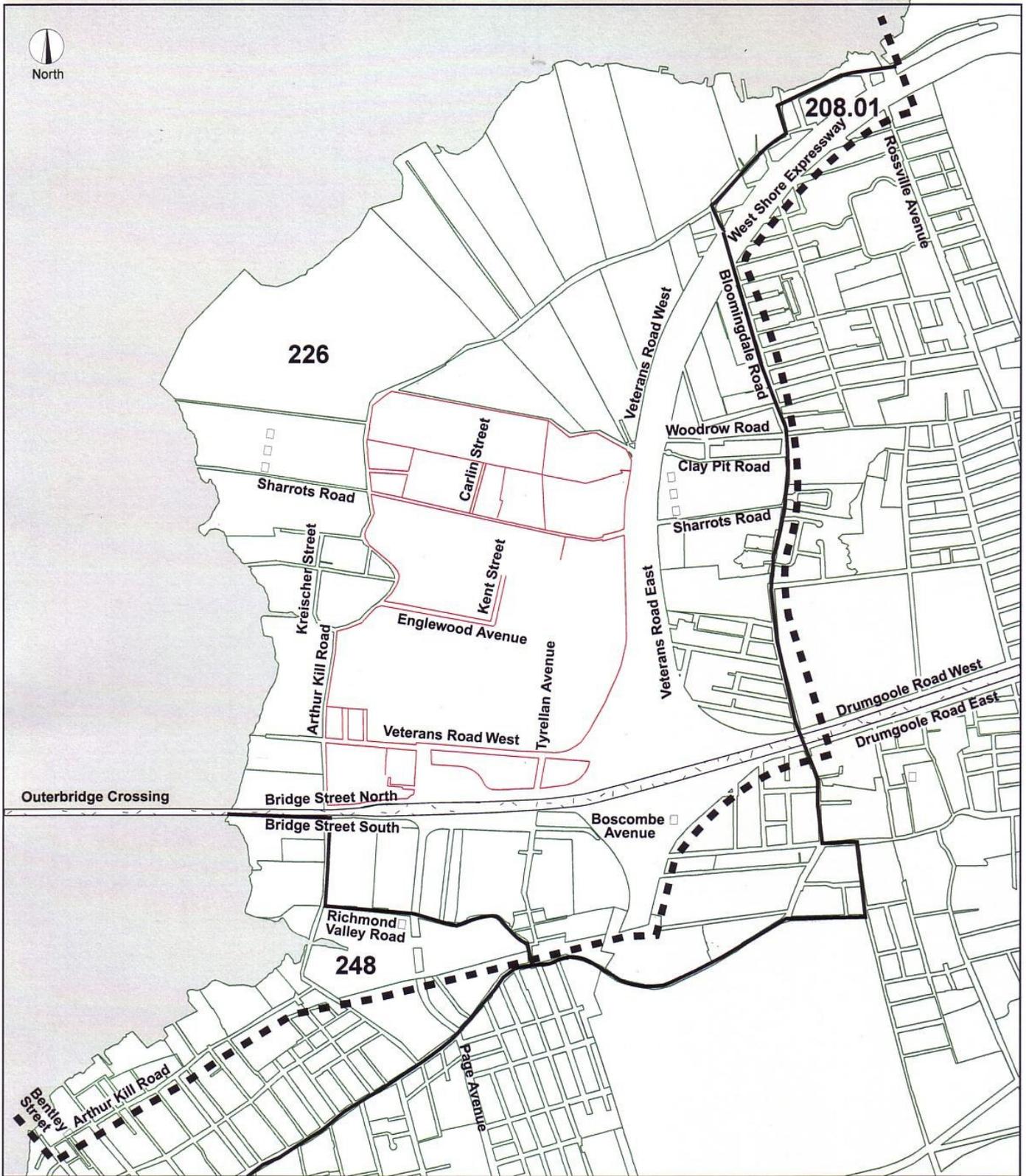
| Census Tracts | Total Population 1990 | Total Population 2000 | Change in Population (#) | Change in Population (%) |
|---------------|--------------------------|--------------------------|-----------------------------|-----------------------------|
| 208.01 | 4,983 | 8,261 | 3,278 | 65.8 |
| 226 | 2,699 | 6,103 | 3,404 | 126.1 |
| 248 | 2,895 | 3,868 | 973 | 33.6 |

In order to calculate the total population of the study area for the years 1990 and 2000, the percentage of the tract located within the study area was multiplied by the total population of the tract. For example, approximately 10 percent of tract 208.01 lies within the study area, and the total population



Horse Crossing Intersections

- ■ ■ Study Area Boundary
- ⊛ Horse Crossing Intersections



Study Area Census Tracts

- ■ ■ Study Area Boundary
- Census Tract Boundary
- 226 Census Tract Number

of tract 208.01 (2000 data) was 2,768. The total population, 2,768, was multiplied by the approximate tract area located within the study area, 10 percent, which provided the estimated study area population for the tract, 277 persons.

The estimated total population of the study area was 3,815 persons in 1990, and 7,225 persons in 2000, suggesting an approximate 90.2 percent, or 3,440 person increase in population from 1990 to 2000 (see Table 5). Table 6 shows the study area total households for the year 2000.

Table 5
Study Area Population and Change in Population Between 1990 & 2000

| Census Tracts (% in study area) | Total Population 1990 | Total Population 2000 | Change in Population (#) | Change in Population (%) |
|------------------------------------|--------------------------|--------------------------|-----------------------------|-----------------------------|
| 208.01 x 10% | 498 | 826 | 328 | 65.8 |
| 226 x 80% | 2,159 | 4,882 | 2,723 | 126.1 |
| 248 x 40% | 1,158 | 1,547 | 389 | 33.6 |
| Total Study Area | 3,815 | 7,255 | 3,440 | 90.2 |

Table 6
Selected Census Tracts and Study Area Total Households 2000

| Census tracts | Total households | Total households (% within study area) |
|---------------|------------------|--|
| 208.01 | 2,768 | (x 10%) 277 |
| 226 | 1,806 | (x 80%) 1,445 |
| 248 | 1,364 | (x 40%) 546 |
| Totals | 5,938 | 2,268 |

Source: U.S. Census Bureau, 2000 Census SF1

Journey-to-Work Modal Split

2000 census data for journey-to-work will not be available until late 2003, therefore 1990 census data was used for the journey-to-work modal split. The journey-to-work modal split for the study area was calculated using the percentage of each tract located within the Charleston study area: 10% for tract 208.01; 80% for tract 226; and 40% for tract 248.

1990 census data reported that there were 1,318 workers aged 16 years and older who resided within the study area (see Table 7). An analysis of this data indicates that approximately 69.9 percent used

Table 7
Total Workers 16 Years and Older Who Reside within the Study Area

| | Census Tracts | | | Total | Percent |
|--|---------------|-----------|-----------|-------|-------------|
| | 208.01 x 10% | 226 x 80% | 248 x 40% | | |
| Total Workers 16 yrs. & Older | 225 | 611 | 482 | 1,318 | 100% |

Source: U.S. Census 1990

cars, trucks, or vans, 23.8 percent used public transportation, 4.3 percent walked to work, 1.4 percent worked at home, and 0.6 percent used other means of transportation (see Table 8).

Table 8
Journey-to-Work Modal Split for Workers Who Reside within the Study Area

| | Census Tracts | | | Total | Percent |
|---------------------------------------|---------------|-------------|-------------|-------------|-------------|
| | 208.01 x 10% | 226 x 80% | 248 x 40% | | |
| Used Car, Truck, or Van | 160 | 423 | 338 | 921 | 69.9 |
| Drove Alone | 128 | 323 | 264 | 715 | -- |
| Carpool | 32 | 100 | 74 | 206 | -- |
| Public Transportation* | 59 | 151 | 104 | 314 | 23.8 |
| Bus | 38 | 37 | 25 | 100 | -- |
| Subway, Railroad, or Ferryboat | 21 | 114 | 79 | 214 | -- |
| Walked | 3 | 26 | 28 | 57 | 4.3 |
| Other | 2 | 6 | -- | 8 | 0.6 |
| Worked at Home | 1 | 6 | 11 | 18 | 1.4 |
| Total | 225 | 612 | 481 | 1318 | 100% |
| Persons per Car, Truck or Van | 1.12 | 1.16 | 1.13 | -- | -- |
| Mean Travel Time to Work (min) | 44.7 | 37.3 | 38.8 | -- | -- |

Source: U.S. Census 1990

* Including taxicab

With regard to place of work, 91.4 percent of the local resident labor force (16 years or older) worked in New York City, while the remaining 8.6 percent worked in various places outside of New York City. Of the local resident labor force who worked in New York City, 48.2 percent worked in Staten Island, 26.9 percent worked in New York County, 14.8 percent worked in Kings County, 1.4

percent worked in Queens County, and 0.1 percent worked in Bronx County. The remaining local resident labor force worked in New York State outside of New York City (1%), New Jersey (6%), and elsewhere (1.6%) as indicated in Table 9.

Table 9
Place of Work for Workers 16 Years and Older Who Reside within the Study Area

| | Census Tracts | | | Total | Percent |
|-------------------------------------|---------------|------------|------------|--------------|-------------|
| | 208.01 x 10% | 226 x 80% | 248 x 40% | | |
| New York City (all boroughs) | 201 | 578 | 426 | 1,205 | 91.4 |
| New York County | 70 | 149 | 135 | 354 | 26.9 |
| Kings County | 49 | 118 | 28 | 195 | 14.8 |
| Queens County | 10 | -- | 9 | 19 | 1.4 |
| Bronx County | 1 | -- | -- | 1 | 0.1 |
| Staten Island | 71 | 311 | 254 | 636 | 48.2 |
| New York State (out of NYC) | 1 | 6 | 6 | 13 | 1.0 |
| Long Island | -- | 6 | -- | 6 | -- |
| Upstate New York | 1 | -- | 6 | 7 | -- |
| New Jersey State | 19 | 21 | 39 | 79 | 6.0 |
| Bergen County, NJ | 1 | -- | -- | 1 | -- |
| Passaic County | -- | -- | 2 | 2 | -- |
| Jersey City | 4 | -- | 6 | 10 | -- |
| Newark, NJ | 7 | 18 | 23 | 48 | -- |
| Middlesex-Somerset-Hunterdon* | 7 | 3 | 8 | 18 | -- |
| Worked Elsewhere | 4 | 6 | 11 | 21 | 1.6 |
| Total | 225 | 611 | 482 | 1,318 | 100% |

Note: * Counties

1990 census data indicates that the study area had a labor force (16 years or older) of 1,693 workers who traveled into the study area to work (inbound labor force). Of the total inbound labor force, 85.6 percent used a car, truck or van, and drove alone or carpooled. The bulk of the car, truck or van usage was from driving alone (85.2 percent). Of the remaining inbound labor force, 8.2 percent used public transit, 4.7 percent walked to work, and 1.4 percent used other means of transportation. For those workers who commuted using public transit, 67.6 percent on bus, 15.1 percent on railroad, 12.2 percent on ferry, 2.9 percent on subways, and 2.2 percent in taxi. See Tables 10 and 11.

Table 10
Total Workers 16 Years and Older Coming into the Study Area from Outside

| | Census Tract | | | Total |
|---|--------------|-----------|-----------|--------------|
| | 208.01 x 10% | 226 x 80% | 248 x 40% | |
| Total Workers 16 Years and Older | 12 | 1,213 | 468 | 1,693 |

With regard to place of origin, 66.6 percent of the inbound labor force (16 years or older) resided in New York City, while the remaining 33.4 percent resided in various places outside of New York City.

Table 11
Journey-to-Work Modal Split for Workers Coming into the Study Area from Outside

| | Census Tracts | | | Total | Percent |
|--------------------------------|---------------|--------------|------------|--------------|-------------|
| | 208.01 x 10% | 226 x 80% | 248 x 40% | | |
| Used Car, Truck, or Van | 10 | 1069 | 371 | 1,450 | 85.6 |
| Drove alone | 9 | 924 | 303 | 1,236 | -- |
| Carpool | 1 | 145 | 68 | 214 | -- |
| Public Transportation | 1 | 88 | 50 | 139 | 8.2 |
| Bus | 1 | 53 | 40 | 94 | |
| Subway | -- | -- | 4 | 4 | |
| Rail | -- | 18 | 3 | 21 | |
| Ferry | -- | 17 | -- | 17 | |
| Taxi | -- | -- | 3 | 3 | |
| Motorcycle | -- | -- | -- | -- | -- |
| Bicycle | -- | -- | -- | -- | -- |
| Walked | 1 | 38 | 41 | 80 | 4.7 |
| Other | -- | 18 | 6 | 24 | 1.4 |
| Total | 12 | 1,213 | 468 | 1,693 | 100% |

Source: U.S. Census 1990

The 66.6 percent of the inbound labor force who resided in New York City breaks down as follows: 59.2 percent resided in Richmond County, 3.8 percent resided in Kings County, 3.3 percent resided in Queens County, 0.2 percent resided in New York County, and 0.1 percent resided in Bronx County. The remaining inbound labor force resided in New Jersey (29.2 percent), New York State outside of New York City (3.2 percent), Pennsylvania (0.2 percent), and elsewhere (0.8 percent). See Table 12.

Table 12
Place of Work for Workers 16 Years and Older Coming into the Study Area from Outside

| | Census Tracts | | | Total | Percent |
|-------------------------------------|---------------|-------------|------------|--------------|-------------|
| | 208.01 x 10% | 226 x 80% | 248 x 40% | | |
| New York City (all boroughs) | 9 | 782 | 337 | 1,128 | 66.6 |
| New York County | -- | -- | 4 | 4 | -- |
| Kings County | -- | 54 | 11 | 65 | -- |
| Bronx County | 1 | -- | -- | 1 | -- |
| Queens County | 2 | 46 | 7 | 55 | -- |
| Richmond County | 6 | 682 | 315 | 1003 | -- |
| New York State (out of NYC) | 1 | 47 | 6 | 54 | 3.2 |
| Long Island | 1 | 15 | -- | 16 | -- |
| Westchester | -- | 22 | 3 | 25 | -- |
| Upstate New York | -- | 10 | 3 | 13 | -- |
| New Jersey | 2 | 374 | 118 | 494 | 29.2 |
| Hudson County | 1 | 27 | 13 | 41 | -- |
| Middlesex County | 1 | 86 | 26 | 113 | -- |
| Bergen County | -- | 21 | 6 | 27 | -- |
| Essex County | -- | 22 | 6 | 28 | -- |
| Monmouth County | -- | 116 | 49 | 165 | -- |
| Ocean County | -- | 31 | 5 | 36 | -- |
| Union County | -- | 31 | -- | 31 | -- |
| Other Counties | -- | 40 | 13 | 53 | -- |
| Pennsylvania | -- | -- | 3 | 3 | 0.2 |
| Others | -- | 10 | 4 | 14 | 0.8 |
| Total | 12 | 1213 | 468 | 1,693 | 100% |

1990 census data suggests that car ownership in the study area was very high. As shown in Figure 7 and Table 13, 91.2 percent of the households located within the study area had at least one or more cars available, in contrast to the 8.8 percent with no car. Of the households with vehicles available, the majority had two cars (41.3 percent), followed by households with one car (38.7 percent), and households with three or more cars (11.2 percent).

Figure 7

Vehicle Ownership by Household
1990 Census

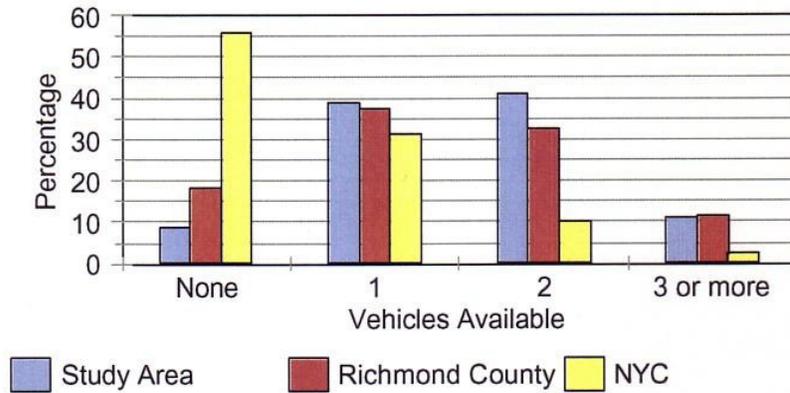


Table 13
Number of Vehicles Available in the Study Area

| Tract | 208.01 x 10% | 226 x 80% | 248 x 40% | Total | Percent |
|-------------------------------|--------------|------------|------------|-------------|-------------|
| None | 8 | 40 | 43 | 91 | 8.8 |
| 1 vehicle | 52 | 165 | 184 | 401 | 38.7 |
| 2 vehicles | 77 | 213 | 137 | 427 | 41.3 |
| 3 or more vehicles | 23 | 69 | 24 | 116 | 11.2 |
| TOTAL | 160 | 487 | 388 | 1035 | 100% |
| Vehicles per household | 1.8 | 1.6 | 1.4 | -- | -- |

Transportation

Street Network and Classification

The local street system within the Charleston study area is not well developed. Many mapped streets are not built. Existing roads are generally two lane streets. The West Shore Expressway (WSE) is located on the eastern boundary of the study area. The major problem is that it is not easily accessible to local traffic, since the WSE does not have continuous service roads. The major north/south route in the study area is Arthur Kill Road.

North/South Streets

Arthur Kill Road is a two lane street with many curves and narrows down to a width of less than 35 feet in some places. This roadway is heavily used by trucks serving manufacturing uses in the area. It appears to be dangerous in some locations and may not have sufficient capacity to handle existing and proposed development. Additionally, Arthur Kill Road is a major route for the cross island S74 bus which runs from St. George Ferry Terminal to Main Street/Amboy Road in Tottenville.

Bloomington Road is a two-way north/south street that runs on the eastern boundary of the study area from Arthur Kill Road to Amboy Road/Pleasant Plains Avenue, and in some locations narrows down to a width of less than 35 feet.

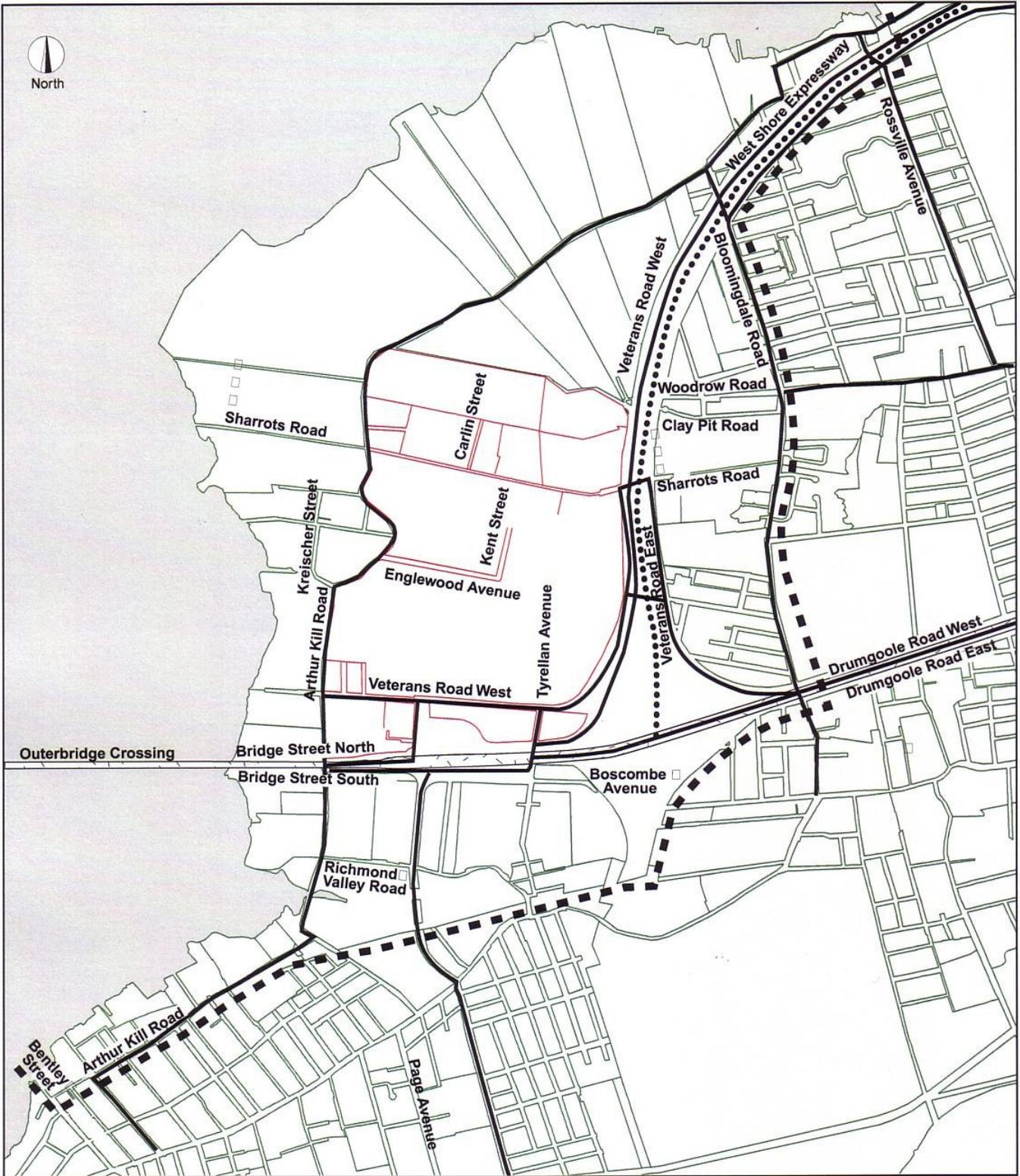
Truck Routes

Truck movement within the five boroughs of New York City is currently governed by the traffic rules and regulations of New York City, Chapters 4-13. These regulations apply to vehicles which are designed for the transportation of property and have either of the following characteristics: two axles and six tires or three or more axles.

There are two major truck route designations: through and local. Through truck routes are designated for trucks having neither an origin nor a destination within the local area. Within the study area, West Shore Expressway (WSE) is an example of a through truck route. The limits of this route are from Korean War Veterans Parkway (former Richmond Parkway) to Staten Island Expressway (SIE). Figure 8 shows the existing truck route network within, and in proximity to, the study area.

Local truck routes are designated for trucks with origins or destinations within an area for the purpose of delivery, loading, or providing service. The following are local truck routes that traverse the study area:

- Arthur Kill Road
- Bloomingdale Road
- Boscombe Avenue
- Englewood Avenue
- Main Street
- North Bridge Street
- Page Avenue
- Korean War Veterans Parkway
- Rossville Avenue
- Sharrotts Road
- South Bridge Street
- Tyrellan Avenue
- Veterans Road East
- Veterans Road West
- West Shore Expressway
- Woodrow Road
- Richmond Road to Main Street
- Amboy Road to Lucille Avenue
- Page Avenue to Weiner Street
- Veterans Road West to Veterans Road East
- Arthur Kill Road to Hylan Boulevard
- Veterans Road West to Arthur Kill Road
- South Bridge Street to Hylan Boulevard
- Outerbridge Crossing to West Shore Expressway
- Arthur Kill Road to Woodrow Road
- Veterans Road East to Veterans Road West
- Arthur Kill Road to Page Avenue
- Boscombe Avenue to Veterans Road West
- Drumgoole Road West to Sharrotts Road, and Bloomingdale Road to Arthur Kill Road
- Arden Road to Bloomingdale Road, and Sharrotts Road to Arthur Kill Road
- Korean War Veterans Parkway to Staten Island Expressway
- Bloomingdale Road to Arthur Kill Road



Existing Truck Routes

- Study Area Boundary
- Local Truck Route
- Through Truck Route

Figure 8

Traffic Accidents

Data was compiled from the New York State Department of Transportation's *Local Accident Surveillance Project* (LASP) for the years 1996 through 2000 (the latest available year). The following information was gathered from LASP and includes total accidents and pedestrian accidents.

- *Total Accidents* - are the number of accidents where a police report was taken at the scene of the accident. The site of the accident may either be at an intersection or at a mid-block location between two intersections.
- *Pedestrian Accidents* - are accidents in which a pedestrian was involved.

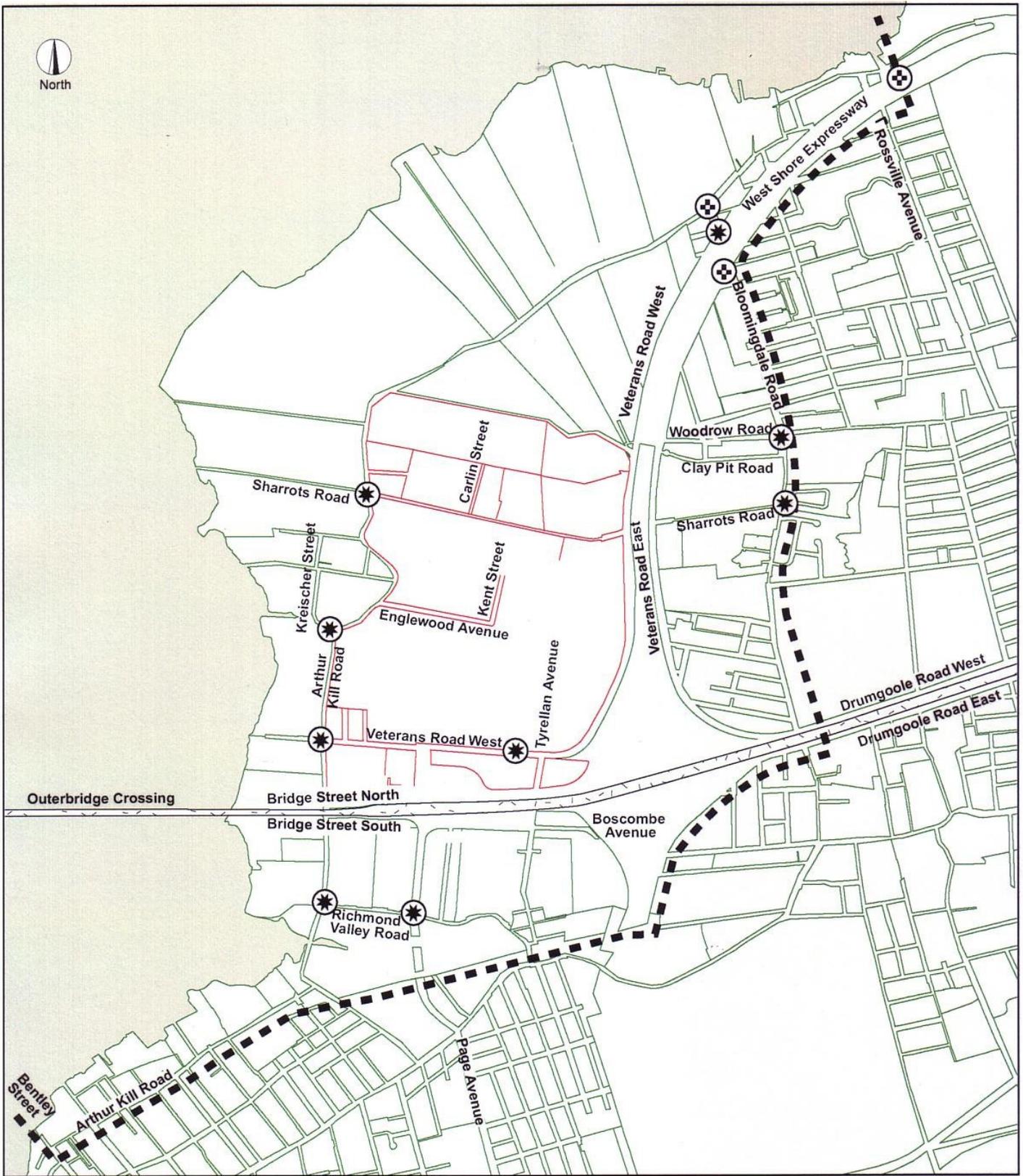
There were 699 total accidents within the Charleston study area during the period from 1996 through 2000, as indicated in Figure 9. Data on the highest number of total recorded accidents revealed that at one location, Bloomingdale Road and Veterans Road East, 37 accidents occurred.

Additionally, the intersections of Rossville Avenue and Veterans Road West, and Bloomingdale and Arthur Kill roads had more than 25 accidents during the same time period. These three intersections are located in the northern portion of the study area in close proximity of each other. Table 14 shows all intersections within the study area that had 10 or more accidents during the time period of 1996 through 2000, and Table 15 shows midblock locations within the study area where 10 or more accidents occurred during the same time period.

Table 14
Intersections with the Highest Number of Total Recorded Accidents
Over a Five-Year Period

| Intersections | 1996-2000 |
|---|-----------|
| Bloomingdale Road and Veterans Road West | 17 |
| Bloomingdale Road and Woodrow Road | 15 |
| Sharrotts Road and Bloomingdale Road | 11 |
| Rossville Avenue and Veterans Road West | 26 |
| Richmond Valley Road and Page Avenue | 14 |
| Allentown Lane and Arthur Kill Road | 17 |
| Bloomingdale Road and Veterans Road East | 37 |
| Veterans Road West and Tyrellan Avenue | 11 |
| Richmond Valley Road and Arthur Kill Road | 10 |
| Kreischer Street and Arthur Kill Road | 14 |
| Sharrotts Road and Arthur Kill Road | 14 |
| Bloomingdale Road and Arthur Kill Road | 28 |

Note: The shaded entries indicate locations where the number of accidents exceeded 25 over a five-year period.



Total Accidents from 1996 to 2000

- ■ ■ Study Area Boundary
- ⊛ Intersections With:
10 - 20 Accidents
- ⊛ Intersections With:
21 - 37 Accidents

Figure 9

Table 15
Midblock Locations With the Highest Number of Total Recorded Accidents
Over a Five-Year Period

| Intersections | 1996-2000 |
|--|------------------|
| Page Avenue and Boscombe Avenue | 11 |
| Richmond Valley Road and Page Avenue | 12 |
| Arthur Kill Road and Englewood Avenue | 12 |
| Englewood Avenue and Bloomingdale Road | 12 |
| Chemical Lane and Arthur Kill Road | 15 |
| Bloomingdale Road and Veterans Road West | 14 |
| Bloomingdale Road and Arthur Kill Road | 15 |

The number of accidents involving pedestrians was very small during the 1996-2000 period. None of the accidents involving pedestrians resulted in a fatality. Table 16 presents accident data at intersections where pedestrians were involved.

Table 16
Locations Where Vehicular Accidents Involved Pedestrians
Over a Five-year Period

| Intersections | 1996-2000 |
|---|------------------|
| Sharrotts Road and Bloomingdale Road | 1 |
| Rossville Avenue and Veterans Road East | 1 |
| Herrick Avenue and Bloomingdale Road | 1 |
| Richmond Valley Road and Arthur Kill Road | 1 |
| Androvette Street and Manley Street | 1 |
| Coke Street and Arthur Kill Road | 1 |
| Chemical Lane and Arthur Kill Road | 1 |

