

2. EXISTING LAND USE / DESCRIPTION OF NEIGHBORHOODS

The following section includes a discussion of the existing land uses in the Downtown Core and Overall Study Areas of the DBSTCS. The Core Study Area encompasses the heart of Downtown Brooklyn, and the Overall Study Area includes a number of discrete neighborhoods, each with their own identity, characteristics, and transit options. The land uses within each of these neighborhoods are inextricably tied to their transportation needs. It is therefore important to understand the land uses within the Study Area because the size, diversity, and locations of its neighborhoods, as well as the built characteristics within each neighborhood, impact the travel demand within the Study Area.

Figure 7 shows the Core Study Area and the nine surrounding neighborhoods that make up the Overall Study Area. The following overview of the Overall Study Area discusses each neighborhood in clockwise order from the north.

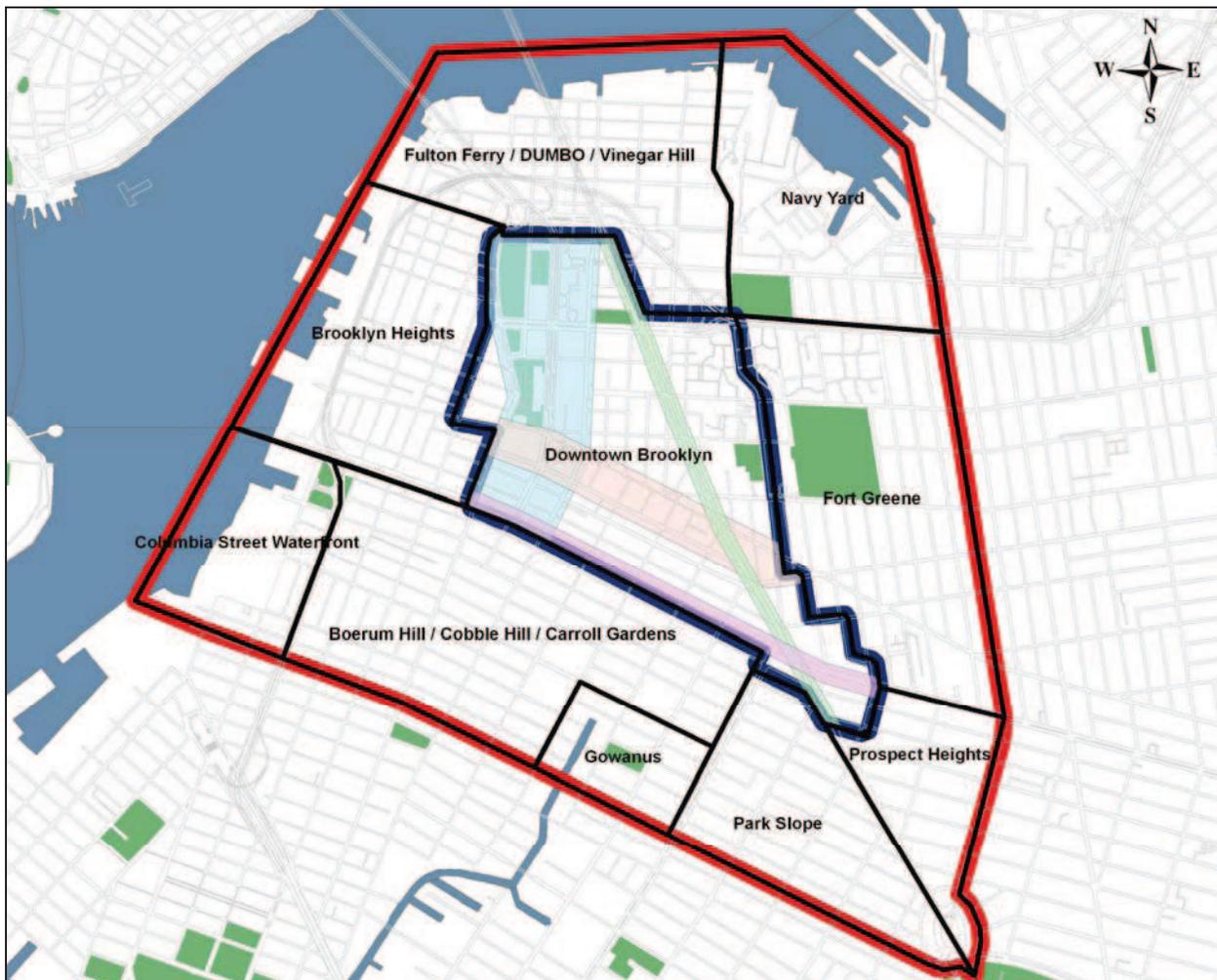


Figure 7 - Overall Study Area and Neighborhoods

2.1 OVERALL STUDY AREA

Fulton Ferry / DUMBO / Vinegar Hill

Fulton Ferry/DUMBO/Vinegar Hill is the area to the north of Downtown Brooklyn generally bounded by the East River to the north, Navy Street to the east, the Brooklyn-Queens Expressway (BQE) and High Street to the south, and the Brooklyn Bridge overpass to the west.

Fulton Ferry (sometimes called Fulton Landing) lies where the foot of Old Fulton Street meets the waterfront. In the shadow of the Brooklyn Bridge, this neighborhood contains a range of land uses, including residential (in converted loft buildings) and commercial (restaurants and local retail) uses; there are also a few vacant lots and vacant former service stations. The 5.5-acre Empire-Fulton Ferry State Park, which includes an esplanade along the East River with excellent views of Manhattan to the north and New York Harbor to the west, is located along Plymouth Street between the overpasses of the Brooklyn and Manhattan Bridges. Fulton Ferry's views of and access to the Brooklyn Bridge, as well as its eateries, retail and overall neighborhood character, make it a strong tourist attraction.



DUMBO, which is short for Down Under the Manhattan Bridge Overpass, is a former industrial area that has seen rapid mixed-use growth and revitalization in the past ten to fifteen years. A number of warehouse and manufacturing buildings in the area have been converted to residential uses, as well as small-scale office uses. There has also been some new construction on formerly underutilized lots. Spurred by these recent developments, restaurants, bars, galleries, grocery stores, and dry cleaners have opened in the area.



Figure 8 - Vinegar Hill: Corner of Gold and Water Streets

Although predominantly industrial in nature, Vinegar Hill (Figure 8), which lies east of Jay Street, contains many residences, most notably along Front Street and Hudson Avenue. At the southern edge of Vinegar Hill lies the New York City Housing Authority (NYCHA) Farragut Houses, which include three blocks of seven-story buildings with a total of approximately 1,400 residential units. Industrial uses in this area include several brick buildings and a large waterfront parcel of land owned and operated by Con Edison as a transformer field. There are also several surface parking lots in this part of the Study Area, including the full block bounded by York, Front, Bridge, and Jay Streets. Like DUMBO, Vinegar Hill is experiencing residential development through loft conversion and new construction.

Brooklyn Navy Yard

The Brooklyn Navy Yard (Figure 9) is located north of Nassau Street/Flushing Avenue and east of Navy Street in the northeast corner of the Study Area. The Navy Yard, purchased by the federal government in

1801, was used to build warships through 1966, including vessels for the U.S. Civil War, the Spanish-American War, and World Wars I and II. New York City purchased the Navy Yard from the federal government in 1967, and the Navy Yard was reopened as an industrial park in 1971.²

Today, the Navy Yard is a 300-acre industrial park containing about forty buildings with more than 200 tenants.³ New York City has invested \$250 million on the Navy Yard in order to upgrade the yard and infrastructure. In response to the decline of industrial space in the City, in Fall 2006, the City announced plans for eight buildings totaling 1.7 million square feet of new industrial space in the Navy Yard.



Figure 9 - The Brooklyn Navy Yard



The area south of the Navy Yard and north of the BQE has a mix of residential, industrial, and institutional uses; several properties in the area are vacant. The ten-acre Commodore Barry Park, Brooklyn's oldest park, is located at Navy and Nassau Streets.

Fort Greene

Fort Greene is a residential neighborhood adjacent and east of Downtown Brooklyn. The area is largely characterized by 19th-century brick and brownstones and other assorted two- to four-story residential buildings with some newer, taller buildings. North of Myrtle Avenue, however, residential uses take the form of large-scale NYCHA developments, including the Ingersoll Houses and Walt Whitman Houses.

A defining land use in this neighborhood is Fort Greene Park (Figure 10), an approximately thirty-acre park

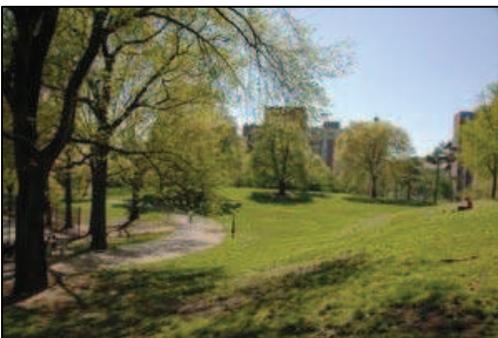


Figure 10 - Fort Greene Park



bounded by DeKalb Avenue, St. Edwards Street, Myrtle Avenue, and Washington Park. The park contains open space, playgrounds and athletic courts. Other public open spaces in this subarea include Cuyler Gore Park at Greene Avenue and Fulton Street and the recently-opened South Oxford Park at Atlantic Commons to the north of Atlantic Avenue.

² Lever, Jane L. "Brooklyn Navy Yard, a Roomy Haven for Industry, Once Again is Booming." *New York Times*. August 29, 2007.

³ www.brooklynnavyyard.org, accessed April 15, 2009

There are a many institutions and public facilities in Fort Greene. Prominent schools include Brooklyn Technical High School and Bishop Laughlin Memorial High School. The 653-bed Brooklyn Hospital Center is adjacent to Fort Greene Park north of DeKalb Avenue and east of Ashland Place.

Prospect Heights

Prospect Heights is located southeast of Downtown Brooklyn and is bounded by Atlantic Avenue to the north and Flatbush Avenue to the west. The neighborhood is characterized by the Vanderbilt Yard to the north and low-rise residential uses to the south. The below-grade Vanderbilt Yard, which services the Long Island Rail Road Atlantic Terminal, runs parallel to Atlantic Avenue from 5th to Vanderbilt Avenues and is bordered by low-density industrial uses such as warehouses, hardware and building suppliers, and smaller factories immediately to the south. Along Dean and Pacific Streets, several former industrial sites have been converted to residential units. South of Bergen Street, this subarea is residential and takes the form of tree-lined streets with three-story rowhouses (Figure 11). Residential buildings are slightly taller (four- to six-stories) closer to the eight-acre Grand Army Plaza. This oval at the main entrance of Prospect Park is New York City's



version of Paris' Arc de Triomphe.



Figure 11 - Bergen Street between Vanderbilt and Carlton Avenues

Commercial uses are located primarily along Flatbush and Vanderbilt Avenues. Flatbush Avenue is lined with commercial uses such as restaurants, furniture stores, optical stores, and bicycle shops. Vanderbilt Avenue is home to more neighborhood retail uses. Newer retail establishments, located closer to Grand Army Plaza, include restaurants, bistros, cafes, wine bars, and plant nurseries.

Park Slope

Park Slope is bounded by Downtown Brooklyn to the north, Flatbush Avenue to the east, and 4th Avenue to the west. The area is known as a low-rise residential neighborhood with ground-floor retail uses along Flatbush, 5th, and 7th Avenues. It contains a mix of mansions, brownstone rowhouses, and apartment houses, most of which were built in the late 19th and early 20th centuries. Residential uses in this area are generally found in three- to four-story brownstone buildings, which typically form uninterrupted street walls along east-west streets and 6th Avenue (Figure 12). The taller buildings are found closer to Grand Army Plaza and Prospect Park, on the periphery of the Park Slope neighborhood. There are a number





Figure 12 - St. Marks Avenue between 5th and 6th Avenues

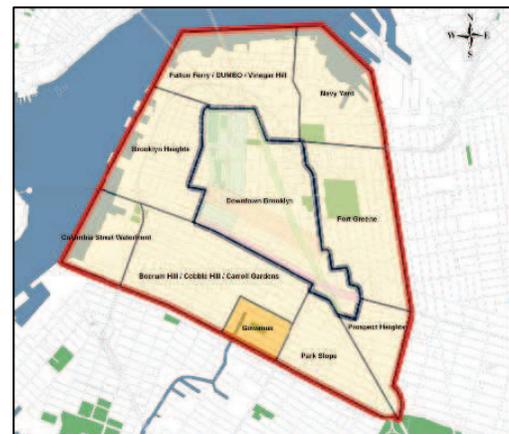
of religious institutions in Park Slope, mostly along 6th, 7th, and 8th Avenues.

Flatbush Avenue is the primary commercial corridor in this part of Brooklyn, with establishments such as restaurants, furniture stores, hardware stores, sports clubs and gyms, and bicycle shops located on the lower levels of three- to four-story buildings. Neighborhood commercial uses, generally in the form of ground-floor retail shops in residential buildings, are located primarily along 5th Avenue. A few newer retail uses in this subarea, are interlaced with the older,

more-established neighborhood retail. To a lesser extent, commercial uses are also located along 4th Avenue, typically in the form of auto-related establishments. The area along 4th Avenue is in transition. The recent rezoning of this corridor has attracted higher-density development as illustrated by the large number of sites under construction or under redevelopment along 4th Avenue.

Gowanus

Gowanus is adjacent to the Gowanus Canal (Figure 13) and is bounded by Baltic Street to the north, 4th Avenue to the east, and Bond Street to the west. This neighborhood represents the industrial character of the uses along the Gowanus Canal, which was once Brooklyn's industrial center and whose banks were developed with industrial and shipping uses, including coal yards, foundries, paint and ink factories, electroplating shops, and paper mills. Over time, the industrial uses along the Gowanus Canal transformed it into one of the City's most polluted waterways.



The neighborhood still contains a high concentration of manufacturing, industrial, and transportation land uses. Light industrial, warehouse, and vacant uses are located east of Bond Street along the canal waterfront. These uses are primarily located in one- and two-story light-industrial buildings and vacant land used for the storage of vehicles. Parking and vacant buildings are also prevalent throughout the subarea. The closed Bayside Oil Terminal is located along the canal waterfront between Sackett and Union Streets. Other industrial uses include art studios, kennels, printers, and an artistic reproduction company.



Figure 13 - View from the Union Street Bridge, looking north

Residential uses in this area are limited and are concentrated along 4th Avenue where recent rezoning has

attracted higher-density, mixed-use development. In February 2009, the City presented a proposal to rezone a large area along the Gowanus Canal for residential use; if approved, it is anticipated that residential uses would replace existing light industrial uses.

The 2.5-acre Thomas Greene Playground, a public playground and outdoor public pool complex, is located on the full block bounded by 3rd Avenue and DeGraw, Douglass, and Nevins Streets.

Boerum Hill /Cobble Hill/Carroll Gardens

Located south of Downtown Brooklyn and north of Gowanus, Boerum Hill/Cobble Hill/Carroll Gardens is bounded by Atlantic Avenue to the north, 4th Avenue to the east (Bond Street south of Baltic Street), and the BQE to the west.

Most of this area is features low-rise residential buildings (Figure 14), some of which contain street-level retail uses along Atlantic Avenue, 4th Avenue, Smith Street, and Court Street. In addition to the three- and four-story rowhouses,



Figure 14 - St. Marks Place between 4th and 5th Avenues

there are also mid-rise apartment buildings and large NYCHA complexes adjacent to the industrial areas bordering the Gowanus Canal: Warren Street Houses, Gowanus Houses, and Wyckoff Gardens. The few industrial uses in this area, which include auto-repair shops, construction/building supply companies, and storage/warehouse facilities, are located along Bergen Street between Nevins Street and 4th Avenue and along Baltic Street at the border of the Gowanus subarea.

There are a number of institutions scattered throughout this area, notably the Brooklyn High School of the Arts at Dean Street and 3rd Avenue and the Long Island College Hospital (LICH), which is comprised of a complex of buildings around Hicks and Amity Streets just south of Atlantic Avenue.



Columbia Street Waterfront

Located along the East River and Buttermilk Channel, the Columbia Street Waterfront is west of the BQE and south of Atlantic Avenue. This area contains a mix of residential and light industrial uses with working waterfront activities along its western edge. Vacant lots are scattered throughout this area, some of which are used for surface parking.

The area is undergoing growth, with new restaurants and art galleries, as well as new residential development. Columbia Street, the main thoroughfare in the neighborhood, contains local retail uses that are generally found on the ground floor of





Figure 15 - Sackett & Columbia Streets

three- or four-story residential buildings (Figure 15). The side streets are lined with rowhouses, with some newer residential apartment conversions such as those centered along Tiffany Place. The waterfront includes the Red Hook Container Terminal. Van Voorhees Park, a 5.25-acre public park, is located at Atlantic Avenue and Columbia Street.

Brooklyn Heights

Brooklyn Heights is located west of Downtown Brooklyn and along the East River waterfront. Known as Brooklyn’s original residential neighborhood, dating back to the early 19th century, Brooklyn Heights contains a well-established mix of residential, office, retail, and institutional uses along tree-lined streets. Most of Brooklyn Heights was developed as a suburb of Manhattan in the early half of the 19th century and is part of the landmarked Brooklyn Heights Historic District. Several modern buildings, including Clark Cadman Tower and Whitman Close Townhouses, are located on the west side of Cadman Plaza West north of Tillary Street.

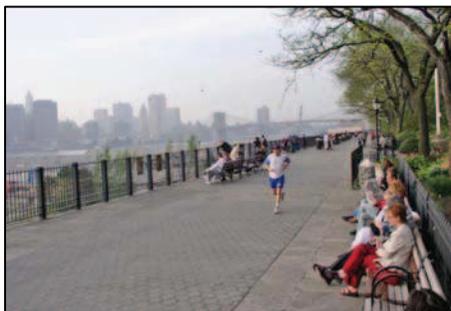


Figure 16 - Brooklyn Heights Promenade, Looking North

A central land use of Brooklyn Heights is the Brooklyn Heights Promenade, a public open space at the western edge of the neighborhood situated on an elevated platform over the BQE and the waterfront uses below (Figure 16). The promenade, which features a walkway, benches, and a small playground, extends from Orange Street south to Remsen Street.

Major retail streets in the area include Montague Street, which is lined with restaurants and shops, and Court Street, which includes restaurants, liquor stores, pharmacies, photo stores, and music stores. Other retail corridors include Atlantic Avenue and a small portion of Henry Street.

2.2 DOWNTOWN CORE STUDY AREA

Downtown Brooklyn, located just across the East River from lower Manhattan, is the economic center of what would constitute America’s fourth largest city and what is New York City’s third largest central business district (CBD) after Midtown and Downtown Manhattan.

Since the middle of the 20th century, Downtown Brooklyn has been the subject of numerous development and revitalization plans. Between 1950 and 1969, New York City built approximately 700,000 square feet of court and municipal office space in Downtown Brooklyn. The State and Federal governments also added almost 550,000 additional square feet of space, which strengthened the area’s role as a government center. Some of the area’s educational and cultural institutions also expanded during these two decades.



Existing land uses in Downtown Brooklyn have been greatly influenced by public policy and public subsidies. In the late



Figure 17 - MetroTech Center

1960s, two urban renewal plans for Downtown Brooklyn sought to revitalize the area: the Atlantic Terminal Urban Renewal Plan (ATURP) and the Brooklyn Center Urban Renewal Plan (BCURP). During the 1980s, Borough Hall was renovated, and large office buildings were erected with significant public subsidies at One Pierrepont Plaza and Livingston Plaza. The establishment of the MetroTech Urban Renewal Plan (MTURP) in 1986 led to the development of the most significant office development in Brooklyn: MetroTech Center (Figure 17). Together, these public policy initiatives dramatically changed the character of Downtown Brooklyn, resulting in the construction of significant large-scale commercial and office uses.

Since 2000, Downtown Brooklyn has been the subject of additional planning efforts. In 2001, the City established the Special Downtown Brooklyn District, which was designed to foster development and strengthen the business core, to preserve the historic architectural character, and to establish a transitional contextual buffer between Downtown Brooklyn and the low-rise residential neighborhoods to the south. In 2004, the City’s Downtown Brooklyn Development project incorporated land use (zoning) actions with the purpose of creating a vibrant urban environment and encouraged a mix of uses that complement Downtown Brooklyn’s commercial core. These uses included new residential development and the creation of a cultural district. As a result, Downtown Brooklyn, though still predominantly commercial and institutional, is now comprised of a mix of land uses, including new residential and hotel uses.



Figure 18 - MetroTech Commons

As noted above, MetroTech – a sixteen-acre corporate and academic complex with more than five million square feet of commercial and municipal office space in twelve buildings ranging in height from eight to thirty-two stories – can be considered the largest single land use in Downtown Brooklyn. MetroTech is roughly bounded by Jay and Willoughby Streets, Flatbush Avenue Extension, and Johnson Street/Tech Plaza. The complex is home to New York

University’s Polytechnic University (NYU Polytech) and several government and municipal agencies, including the New York City Fire Department and 911 Emergency Response headquarters. MetroTech’s major commercial tenants include KeySpan, JP Morgan Chase, and Verizon. MetroTech Center’s public plaza, known as The MetroTech Commons, provides 3.3 acres of passive open space (Figure 18).

In addition to MetroTech, Downtown Brooklyn is defined by its institutions and public facilities. Brooklyn’s Civic Center comprises the northwest corner of the Core Study Area and houses a number of City, State, and Federal institutions, including Brooklyn Borough Hall and Municipal Building, Brooklyn Criminal Court, Brooklyn Family Court, the General Post Office, the New York State Supreme Court, the New York City Housing Court, and the U.S. Federal Courthouse at Cadman Plaza East. The New York State Supreme Court and Borough Hall are located within the superblock bounded by Johnson Street/Tech Plaza, Cadman Plaza West/Court Street, Adams Street, and Joralemon Street. Columbus Park, a 4.1-acre park, surrounds these two buildings. Other sizable open spaces in the Civic Center area include the 2.9-acre Walt Whitman Park north of the U.S. Federal Courthouse at Cadman Plaza East and the 10.4-acre S. Parkes Cadman Plaza between Cadman Plaza East and Cadman Plaza West.

There are also several educational institutions in Downtown Brooklyn. In addition to NYU Polytech, these include the New York City College of Technology (City Tech, part of the City University of New York [CUNY]) located at Tillary and Jay Streets, Long Island University’s (LIU) Brooklyn campus at Flatbush and DeKalb Avenues, St. Francis College at Remsen and Clinton Streets, and the George Westinghouse Vocational and Technical High School at Tillary Street and Flatbush Avenue. Brooklyn Law School’s Main Building is located on Joralemon Street at Boerum Place, and the school’s recently-opened dormitory building (Feil Hall) is located three blocks south at State Street and Boerum Place. Two recently-built public schools occupy a former courthouse building at 283 Adams Street: The Urban Assembly School for Law and Justice (grades 9 -12) and the Urban Assembly Institute Of Math And Science For Young Women (grades 6-12).

Cultural institutions are also an important land use in Downtown Brooklyn. The Brooklyn Academy of Music (BAM) is located at Lafayette Avenue and Ashland Place (Figure 19). BAM has been attracting international performing arts and film to Brooklyn since 1861, and its building was constructed in 1906. The Mark Morris Dance Company also has recently been installed in a new building on Lafayette Avenue between Flatbush Avenue and Ashland Place. These institutions are located within the BAM Cultural District, the goal of which is to convert underutilized city-owned properties along Flatbush and Lafayette Avenues from surface parking lots and other uses into affordable performance and rehearsal space, mixed-income housing, and new public open space.

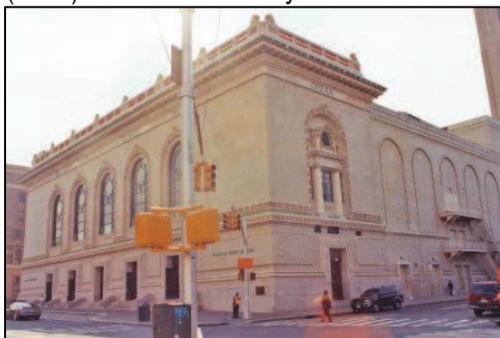


Figure 19 - Brooklyn Academy of Music

In addition to the commercial uses in MetroTech, there are office and retail uses throughout Downtown Brooklyn. One of the most prominent and successful retail areas in Downtown Brooklyn is the Fulton Street Mall, which extends along Fulton Street between Adams Street and Flatbush Avenue. This section contains mostly three- to five-story commercial structures with ground-floor retail uses. Typical ground-floor uses include clothing, furniture, vitamin, and music stores. While the ground-floor uses on Fulton Street are very active, the upper floors of buildings have little activity and include several vacancies. Ground-floor

neighborhood retail uses are also found in a wedge of blocks between Fulton and Willoughby Streets east of Jay Street and along the Montague Street, Court Street, and Atlantic Avenue commercial corridors.

Large-scale retail uses in Downtown Brooklyn include the Atlantic Terminal/Bank of New York Tower, which opened in July 2004 on the northeast corner of Flatbush and Atlantic Avenues and is comprised of a 300-foot-tall office tower atop a four-story retail complex above the Long Island Rail Road Atlantic Terminal, and the Atlantic Center Mall at Atlantic Avenue and Fort Greene Place, which connects the Atlantic Center to the Atlantic Terminal/Bank of New York Tower via a pedestrian bridge over Fort Greene Place. The former retail mall known as The Gallery at Fulton Street (Albee Square) was recently demolished, and a mixed-use building is currently under construction on this site.

Renaissance Plaza, a 32-story office and hotel complex that was constructed in 1999 is located along Adams Street between Johnson and Willoughby Streets (Figure 20). Construction of this complex resulted in Brooklyn’s first new major hotel – the Brooklyn Marriott – since the 1920s. The Brooklyn Marriott was expanded in 2006 to provide an additional 280 guest rooms (for a total of 656). Mid-rise office buildings also line Cadman Plaza West north of Joralemon Street.

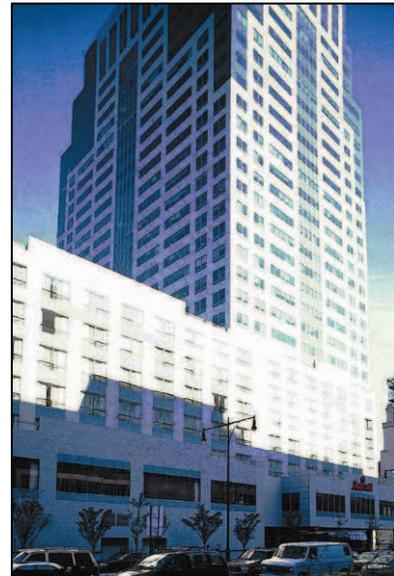


Figure 20 - Renaissance Plaza

Residential uses, while not as prominent as commercial and institutional uses, are becoming more common in Downtown Brooklyn as a result of recent public policy initiatives and – up until recently – Brooklyn’s expanding residential real estate market. Long-standing residential uses in the area include Concord Village at Adams and Tillary Streets, University Towers along Willoughby Street east of Flatbush Avenue, and the low-rise brownstones along State Street and Atlantic Avenue. New residential development in the area has taken the form of converted office and loft buildings, including the 27-story Belltel Lofts in the former New York Telephone Company building at Bridge and Willoughby Streets and the 512-foot Williamsburgh Savings Bank Building at One Hanson Place near Flatbush Avenue.

New mid- and high-rise residential buildings, some of which are still under construction, are located along Schermerhorn and Livingston Streets and Flatbush Avenue. These developments, which have replaced several surface parking lots in the southern part of Downtown Brooklyn, include:

- State Renaissance Court: 8 stories, 158 units
- Schermerhorn House: 11 stories, 217 units
- Be@Schermerhorn: Two towers (14 and 25 stories), 226 units.

Taller residential buildings line Flatbush Avenue north of Willoughby Street. These include:

- Toren Building (Flatbush and Myrtle Avenues): 40 stories, 280 units
- Oro Gold (Flatbush Avenue and Gold Street): 40 stories
- Avalon Fort Green (Myrtle Avenue, east of Flatbush Avenue): 42 stories, 650 units

2.3 SURFACE TRANSPORTATION ACCESSIBILITY BY NEIGHBORHOOD

Each neighborhood in the Study Area is distinct in its land use as well as its transportation options. The overall transit system within the Study Area consists of subways and buses. The following analysis focuses only on the availability of surface transit within Study Area neighborhoods.

Using GIS and the bus stop density in the Study Area, each neighborhood is ranked based on the density of bus routes compared to total neighborhood area. Figure 21 shows the relative accessibility to surface transit in the Study Area, where green areas are well served and red areas have weaker surface transit. Table 2 summarizes the rankings.

Table 2 - Surface Transit Accessibility

Rank	Neighborhood	No. of Bus Routes	Transportation Access Score (% max)
1	Downtown Brooklyn	17	416.6 (100.0 %)
2	Prospect Heights	6	174.3 (41.8 %)
3	Fort Greene	9	165.2 (39.7 %)
4	Park Slope	7	147.5 (35.4 %)
5	Columbia Street Waterfront	2	96.7 (23.2 %)
6	Boerum Hill / Cobble Hill / Carroll Gardens	5	95.9 (23.0 %)
7	Gowanus	3	79.8 (19.2 %)
8	Fulton Ferry / DUMBO / Vinegar Hill	7	79.0 (19.0 %)
9	Navy Yard	3	79.0 (19.0 %)
10	Brooklyn Heights	3	62.0 (14.9 %)

Numerous bus services along Livingston Street, Fulton Street, and Cadman Plaza result in Downtown Brooklyn being the most accessible neighborhood in the Study Area. Areas that have very little bus service include the Brooklyn Heights and Fulton Ferry / DUMBO / Vinegar Hill neighborhoods. Brooklyn Heights is not served by bus service and Fulton Ferry / DUMBO / Vinegar Hill has very few bus routes and stops. By using Figure 21 and Table 2, the surface transit issues associated with each neighborhood in the study area can be analyzed. These transportation issues are discussed in more detail in the Problem Identification section.

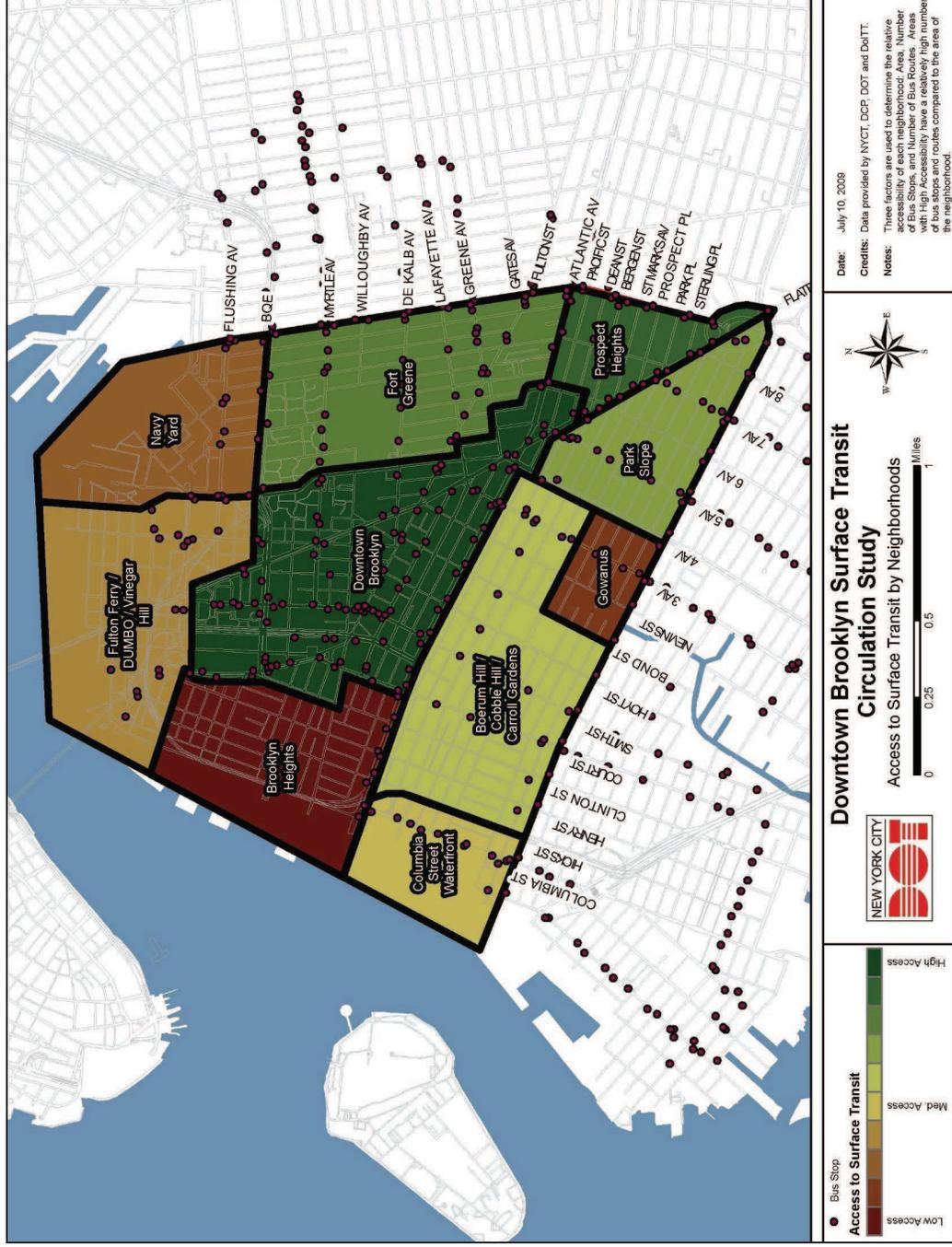


Figure 21 - Accessibility to Bus Network by Neighborhood

2.4 DEMOGRAPHICS

This section describes the existing demographic conditions and trends within the Core and Overall Study Areas of the DBSTCS. Demographic data is from the New York Metropolitan Transportation Council (NYMTC), the United States Census Bureau (US Census), and ESRI, Inc., a private data provider. Data was collected at either the Transportation Analysis Zone (TAZ) or census tract level.

TAZs and census tracts do not always align exactly with the Study Area boundaries. Therefore, TAZs with centroids located in the Study Area are counted in full, and zones with centroids located outside of the Study Area are not counted at all. Census Tracts that include a significant portion of the Study Area are included.

Population

As shown in Table 3, all areas analyzed experienced population growth from 1990-2000, as well as from 2000-2008. According to the U.S. Census, the Core Study Area grew from 20,758 residents in 1990 to 22,918 residents in 2000, a growth rate in excess of ten percent, which was the highest in all of the four areas. The Overall Study Area experienced almost a five percent increase in residents between 1990 and 2000. Over the same period, Brooklyn experienced a 7.2% growth rate, while New York City's overall growth rate (9.4%) more closely matched the growth rate experienced in the Core Study Area.

ESRI's 2008 population estimates indicate that the Core Study Area has maintained the highest growth rate among the four areas since 2000. Between 2000 and 2008, the Core Study Area gained an estimated 1,936 persons for a total of 24,854 residents, or an 8.4% increase since 2000. The other three areas each experienced between three and four percent growth in their residential populations.

Table 3 - Total Population, 1990-2008 (US Census, ESRI)

Area	Total Population			Percent Change	
	1990	2000	2008	1990-2000	2000-2008
Core Study Area	20,758	22,918	24,854	10.4	8.4
Overall Study Area	111,809	117,319	121,464	4.9	3.5
Brooklyn	2,300,664	2,465,326	2,548,982	7.2	3.4
New York City	7,322,564	8,008,278	8,327,026	9.4	4.0

As shown in Table 4, the Core Study Area, with 46,910 people per square mile, is the densest area that was analyzed. While the Overall Study Area is denser than New York City as a whole, its population density is less than that of Brooklyn. Figure 22 shows how the population density in the Study Area relates to the bus routes.

Table 4 - Population Density (NYMTC)

Area	Population (2005)	Area (Square Miles)	Density (2005)
Core Study Area	22,517	0.48	46,910
Overall Study Area	119,144	3.82	31,190
Brooklyn	2,511,408	70.5	35,623
New York City	8,213,839	308.9	26,591

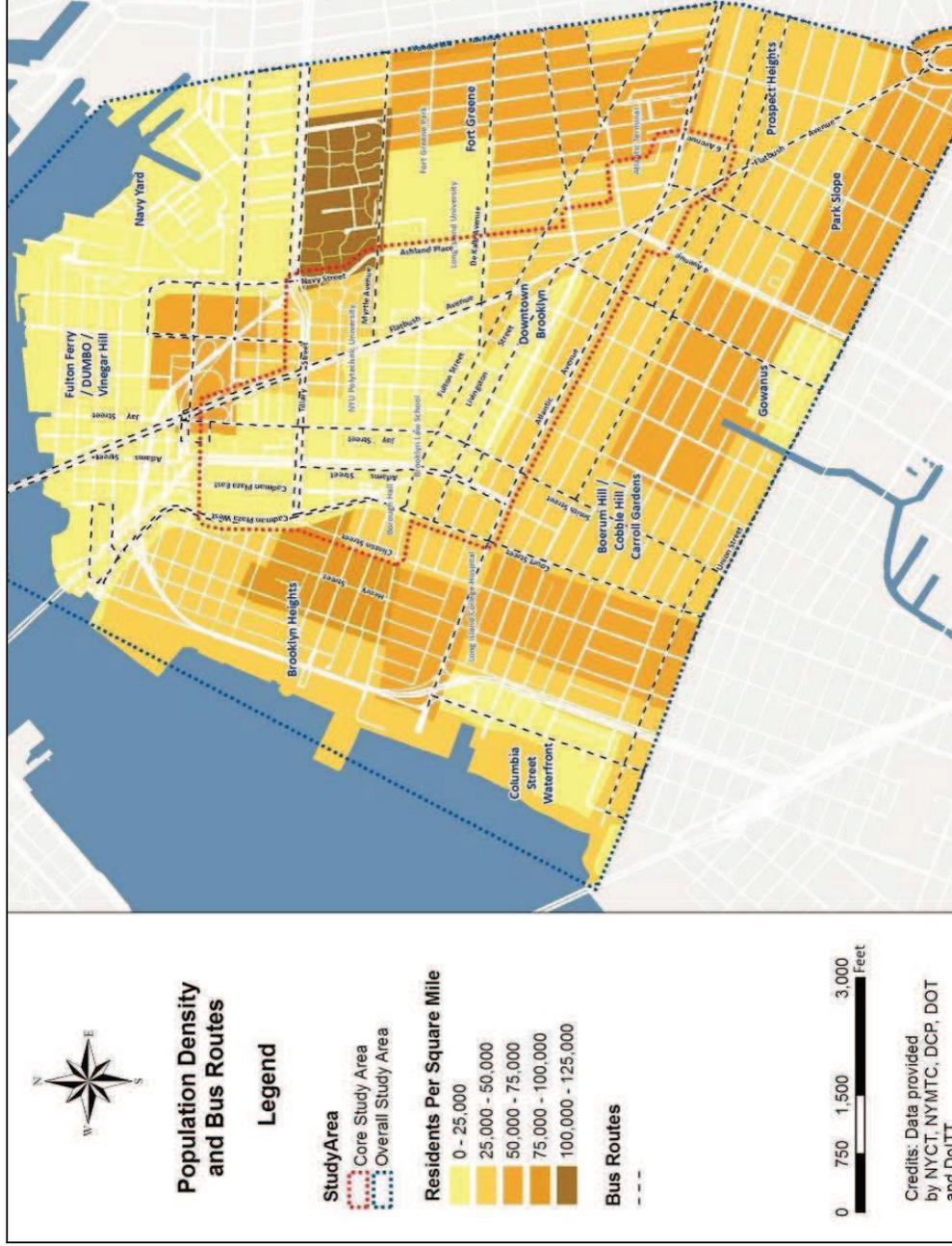


Figure 22 - Population Densities and Bus Routes

Households

Between 1990 and 2000 the average household size in the Core and Overall Study Areas decreased substantially but has stabilized since then based on 2008 demographic estimates (Table 5). The year 2000 average household size in the Core Study Area was 2.01 persons per household, down from 2.11 in 1990. In the Overall Study Area, the average household size decreased from 2.24 to 2.10 persons per household between 1990 and 2000. The average household size in both the Study Areas has consistently been lower than those of Brooklyn and New York City.

Table 5 - Household Size (US Census, ESRI)

Area	Average Household Size		
	1990	2000	2008
Core Study Area	2.11	2.01	2.01
Overall Study Area	2.24	2.10	2.11
Brooklyn	2.74	2.75	2.78
New York City	2.54	2.59	2.61

Employment

Table 6 shows the relative levels of employment density, and Figure 23 demonstrates how employment density in the Study Area relates to bus routes. As is common for metropolitan regions, Downtown Brooklyn is composed of a city center with retail, restaurant, office, and residential space surrounded by a more residential area. Employment density is substantially higher in the Core Study Area compared to the Overall Study Area, with 196,196 and 46,324 employees per square mile, respectively. This demonstrates that the Core Study Area is a commercial center within the Overall Study Area.

Table 6 - Employment Density (NYMTC)

Area	Employment (2005)	Area (Square Miles)	Density (2005)
Core Study Area	94,204	0.48	196,196
Overall Study Area	176,957	3.82	46,324
Brooklyn	453,911	70.5	6,438
New York City	3,491,506	308.9	11,303

Transit is most effective in areas with high densities of both residents and employees, so vehicles are filled with residents leaving in the AM while employees arrive, and vice versa in the PM. Figure 24 presents both the residential and employment densities within the Study Area. As shown in the figure, Downtown Brooklyn is the ideal candidate for transit with high densities of residents and employees.⁴ Brooklyn Heights and Smith Street (south of Schermerhorn Street and north of Bergen Street), are also well positioned for two-way transit demand.

⁴ High population and employment density is defined as the highest one-third TAZ, whereas low is the lowest one-third.

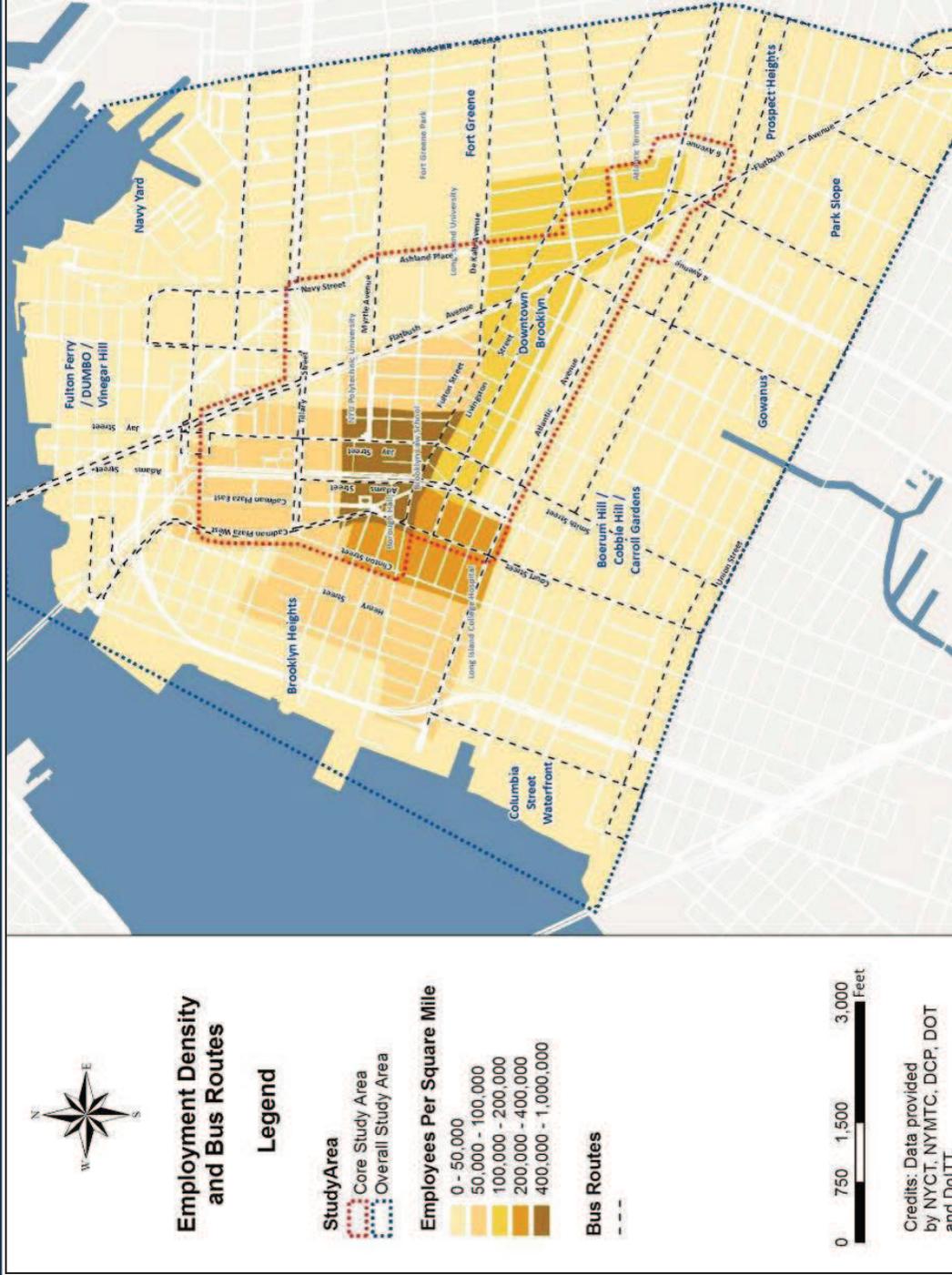


Figure 23 - Employment Densities and Bus Routes

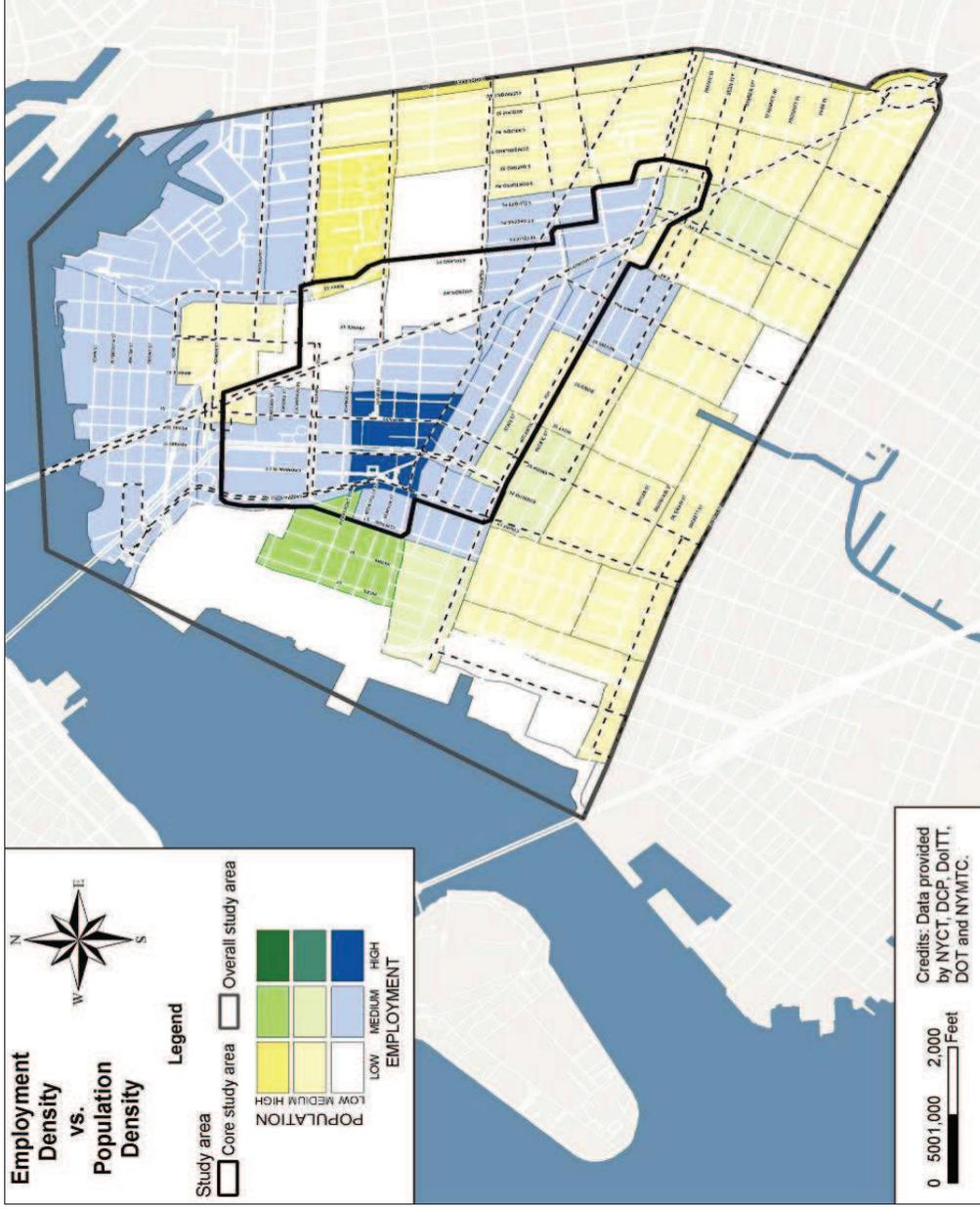


Figure 24 - Population and Employment Densities (NYMTC)

Income

Median household income has continually grown in the Core and Overall Study Areas (Table 7).

Table 7 - Income Characteristics (US Census, ESRI)

Area	Median Household Income (2008 Dollars)					% Below Poverty Level		
	1989	1999	2008	%Δ	%Δ	1989	1999	2008
				1989-1999	1999-2008			
Core Study Area	\$65,433	\$67,116	\$71,657	2.6	6.8	17.3	19.6	n/a
Overall Study Area	\$53,277	\$69,531	\$72,914	30.5	4.9	20.6	20.6	n/a
Brooklyn	\$46,369	\$42,807	\$43,514	-7.7	1.7	22.7	25.1	n/a
New York City	\$53,809	\$51,869	\$52,423	-3.6	1.1	19.3	21.3	n/a

The Core Study Area median household income increased from \$65,433 in 1989 to \$67,116 in 1999 (2008 dollars). At the same time, however, the proportion of the population in the Core Study Area living below the poverty level increased from 17.3% to 19.6%. From 1999 to 2008, the median household income increased by 6.8% in the Core Study Area. The Overall Study Area experienced more than a 30% increase in median household income between 1989 and 1999, but only a 4.9% increase from 2000 to 2008. Despite the increases in median household income, the percentage of the population below the poverty level in the Overall Study Area was the same in 1989 and 1999. In contrast, the median household incomes for Brooklyn and New York City decreased between 1989 and 1999, while the percentage of the population living below the poverty level increased. From 1999 to 2008, median income increased slightly in both Brooklyn and New York City, but not as much as it did in the Core and Overall Study Areas.

Housing

In all four areas, the total number of housing units increased between 1990 and 2008, as shown in Table 8. The Core Study Area experienced a slow rate of growth between 1990 and 2000, with an increase of 257 housing units, or 2.7%. In the Overall Study Area, 3,295 housing units were added from 1990 to 2000, an increase of 6.5%. Brooklyn also had a 6.5% increase over the same time period, similar to New York City, where the number of housing units increased by seven percent.

Between 2000 and 2008, the housing stock in the Core Study Area increased while growth rates in other areas declined relative to the pace of development experienced in the 1990s. The Core Study Area had an 11.5% growth rate, while the housing growth in all other areas was between four and six percent. These findings demonstrate that Downtown Brooklyn is an area of continuous growth and development.

Table 8 - Housing Units, 1990-2008 (US Census, ESRI)

Area	Total Housing Units			Percent Change	
	1990	2000	2008	1990-2000	2000-2008
Core Study Area	9,693	9,950	11,090	2.7	11.5
Overall Study Area	50,715	54,010	56,995	6.5	5.5
Brooklyn	873,671	930,866	970,346	6.5	4.2
New York City	2,992,169	3,200,912	3,352,248	7.0	4.7

Vacancy

As shown in Table 9, the number of vacant housing units decreased from 1990 to 2000 in the Core and Overall Study Areas. Vacancy rates were around eight to nine percent in 1990, and dropped to about four to five percent in 2000. In Brooklyn and New York City, vacancy rates were lower than in the two Study Areas in 1990. Between 1990 and 2000, vacancy rates stayed about the same in Brooklyn and New York City, increasing from 5.2% to 5.4% in Brooklyn, and decreasing from 5.8% to 5.6% in New York City.

Between 2000 and 2008 the percentage of vacant units increased in all four areas. The 2008 vacancy rate in the Core and Overall Study Areas was about six percent, slightly lower than in Brooklyn and New York City, which had vacancy rates of about seven percent.

Table 9 - Vacant Housing Units, 1990-2008 (US Census, ESRI)

Area	Vacant Housing Units					
	1990	% of total	2000	% of total	2008	% of total
Core Study Area	909	9.4	488	4.9	709	6.4
Overall Study Area	4,105	8.1	2,378	4.4	3,496	6.1
Brooklyn	45,472	5.2	50,139	5.4	67,178	6.9
New York City	172,768	5.8	179,324	5.6	237,334	7.1

Ownership

As shown in Table 10 and Table 11, home ownership increased between 1990 and 2008. The shift was most pronounced in the Core and Overall Study Areas, with about 23% of the housing stock being owner-occupied in 1990, increasing to about 30% in 2008. Brooklyn and New York City also saw their housing stock become increasingly owner-occupied, though at a slightly lower rate. By 2008, all areas had similar percentages of owner-occupancy housing units, ranging from 28% (Brooklyn) to 31% (New York City).

Table 10 - Owner-Occupied Housing Units, 1990-2008 (US Census, ESRI)

Area	Total Owner-Occupied Housing Units					
	1990	% of total	2000	% of total	2008	% of total
Core Study Area	2,217	22.9	2,710	27.2	3,345	30.2
Overall Study Area	11,795	23.3	14,400	26.7	16,841	29.5
Brooklyn	214,788	24.6	238,367	25.6	270,884	27.9
New York City	807,378	27.0	912,296	28.5	1,032,005	30.8

Table 11 - Renter-Occupied Housing Units, 1990-2008 (US Census, ESRI)

Area	Total Renter-Occupied Housing Units					
	1990	% of total	2000	% of total	2008	% of total
Core Study Area	6,567	67.7	6,752	67.9	7,036	63.4
Overall Study Area	34,815	68.6	37,232	68.9	36,658	64.3
Brooklyn	613,411	70.2	642,360	69.0	632,284	65.2
New York City	2,012,023	67.2	2,109,292	65.9	2,082,909	62.1